

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI -627012

3rd year **Syllabus** for Part-I Language (National)-Hindi (CBCS)-2012 onwards

Common for B.A/B.Sc/B.B.A/B.Com/B.Sc–ComputerScience/Electronics

B.A-Corporate Secretary ship

Aims and objectives

Hindi is the second most widely spoken language in the world, and is the national official language of the constitution of India. It belongs to Indo-European language family.

Current syllabus designed based on the model curriculum framed by the University Grants Commission (UGC) This course also caters the need of the learner in the globalization arena. This will enable the students to have higher education and job opportunities.

Learning outcome

The syllabus will enable students to know the Literature, Linguistics, Translation theory, Spoken language and to know more about editing, reporting. In addition to that, functional aspects of the language are also included.

As citizens of an increasingly global world, the more the learners can know about each other, the better they will be able to live together on our shrinking planet.

Eligibility Norms: For Admission in the course students must have passed the Higher secondary course studied Hindi as Part –I Language or Passed Higher secondary course and Rashtra Bhasha Examination Conducted by DakshinBharath Hindi Prachar Sabha ,Chennai.

SCHEME OF EXAMINATION

Semester	Title of the Paper	Teaching Hours/ week	Exam hrs	External marks	Internal Marks	Max. Marks	Passing Minimum
I Semester	Prose, Short stories, Grammar, Journalism and Comprehension	6	3	75	25	100	40
II Semester	Drama, Novel, Spoken Hindi, Grammar, Letter writing and Precis writing	6	3	75	25	100	40
III Semester	Ancient Poetry, Short-epic, History of Hindi Literature (Ancient Period), Principles of Translation	6	3	75	25	100	40
IV Semester	Modern Poetry, History of Hindi Literature (Modern Period), Prosody & Poetics, General Essay, Administrative Hindi	6	3	75	25	100	40

Components	I Semester Hours	Credits
Unit-I- Prose	2	3
Unit-II-Short stories	1	
Unit -III- Grammar	1	
Unit-IV -Comprehension	1	
Unit-V- Journalism	1	
Components	II Semester Hours	Credits
Unit-I- Drama	2	3
Unit-II- Novel	1	
Unit -III- SpokenHindi	1	
Unit-IV- Grammar	1	
Unit-V- Letter writing and Precis writing	1	
Components	IIISemester Hours	Credits
Unit-I- Ancient Poetry	1	3
Unit-II-Long Poem	1	
Unit -III- History of Hindi Literature (Ancient Period) Upto Bhakthikal	1	
Unit-IV-History of Hindi Literature(Ancient period)- Ritikal	1	
Unit-V- Principles of Translation	2	
Components	IV Semester Hours	Credits
Unit-I- Modern Poetry	1	3
Unit -II- History of Hindi Literature (Modern Period)	1	
Unit-III-Prosody and Poetics	2	
Unit-IV- General Essay,	1	
Unit-V-Administrative Hindi	1	

Semester –I

Paper I

Prose, Short stories, Grammar, Journalism and Comprehension

Unit –I

Prose

**Text :Gadya Prakash by Sri.LakshmiKanth Varma
Publisher: Lokbharathi,15-A,Mahatma Gandhi Marg,
Allahabad-3**

Lessons to be taught :

- 1.Mere Swapnon ka Bharath
- 2.Bisati
- 3.TajMahal ki Atmakahani
- 4.Premchand
- 5.Bholaram ka Jeev

Unit –II

Short stories

Text: Hindi Ki Pratinidhi Kahaniyan by Virat

**Publisher: Jawahar Pustakalaya,Sadar Bazar,
Mathura,U.P, Pin code:281001**

Lessons to be taught:

- 1.Sadgati
- 2.Dilli mein ek Mouth
- 3.Malbe ka Malik
- 4.Pahad
- 5.Swimming Pool

Unit –III

Grammar

Text-Vyakaran Pradeep: By Ramdev

Publisher:Hindi Bhavan,Allahabad-2

Topics to be Covered: Noun,Gender,Number and Case ending,
Pronoun,Adjectives

Unit –IV

Comprehension

Text-Vyakaran Pradeep: By Ramdev

Publisher:Hindi Bhavan,Allahabad-2

Topics to be Covered:Comprehension Passages.

Unit –V

Journalism

Text: Adhunik Pathrakarita by Arjun Tiwari

Publisher:Viswavidyalaya Prakashan,Varanasi

Topics to be Covered: Origin of News paper- Collection of News-Variou
Sources-Feature writing-Editorial writing-Radio and Television News.

Semester –II

Paper II

Drama,Novel,Spoken Hindi,Grammar, Letter writing and Precis writing

Unit –I

Drama

Text : Aadhe -Adhoore by Mohan Rakesh

Publisher:Radhakrishna Prakashan,7/31,

Anzari Road,Dariyaganj,New Delhi-110002

Unit –II

Novel

Text:Nirmala by Premchand

Publisher:Prakashan Sansthan,4715/21,

DayanandMarg,Dariyaganj,New Delhi-110002

Unit –III

Spoken Hindi

Text:Bolchal ki Hindi by Dr.Susheela Gupta

Publisher: Lokbharathi,15-A,Mahatma Gandhi Marg, Allahabad-3

Topics to be covered:

- 1.Ghar mein Ma ke Sath
- 2.Athithi Satkar
- 3.Marg mein Paidal
- 4.Uphar grih mein
- 5.Pustak Vikreta ke yahan
- 6.College mein
- 7.Dak khane mein
- 8.Bank mein
- 9.Sabha grih Mein
- 10.Telephone pur
- 11.Kuch Samanya Bhoolein aur unke sudh roop

Unit-IV

Grammar

Text:Vyakaran Pradeep: By Ramdev

Publisher - Hindi Bhavan,Allahabad-2

Topics to be Covered: Verb ,classification of verb,Preposition ,Cojunction and Interjunction.

Unit –V

Letter writing Precis writing

Text: Abhinav Pathralekhan

Publisher:Dakshin Bharath Hindi Prachar Sabha

Chennai-600017

Topics to be Covered: Leave application,Application for a notified vacancy, Application for Bank loan, Ordering of Books from a Publisher, Complaining to civil authorities, Precis Writing.

Semester –III

Paper III

Ancient Poetry, Long Poem, History of Hindi Literature (Ancient Period), Principles of Translation

Unit –I

Ancient Poetry

Text :KavyaTarang by Dr.Niranjan

Publisher: Jawahar Pustakalaya,Sadar Bazar,

Mathura,U.P, Pin Code:281001

Topics to be Covered:

1.Kabirdas

2.Surdas

3.Tulsidas

4.Meeradas

Unit –II

Long Poem-Text:Saroj Smruthi by Nirala

Publisher: Lokbharathi,15-A,

Mahatma Gandhi Marg,Allahabad-3

Unit –III

History of Hindi Literature(Ancient Period)-Upto Bhakthi kal

Text:Hindi Sahitya Ka Sankshipth Ithihas

Published by Kendriya Hindi Sansthan,Agra

Topics to be covered:Veergathakal,Bhakthikal

Unit-IV

History of Hindi Literature(Ancient Period)-Upto Ritikal

Text:Hindi Sahitya Ka Sankshipth Ithihas

Published by Kendriya Hindi Sansthan,Agra

Topics to be covered:Riti badh kavi,Riti sidh kavi,Riti Mukth kavi

Unit –V

Principles of Translation

Text- Anuvad Vigyan ,Bholanath Tiwari

Publisher: Lokbharathi,15-A,

Mahatma Gandhi Marg, Allahabad-3

Topics to be Covered: Different Types of Translation, Qualities of a translator, Interpretation, Technical terminology

Semester –IV

Paper IV

Modern Poetry, History of Hindi Literature (Modern Period),

Prosody &Poetics, General Essay, Administrative Hindi

Unit –I

Modern Poetry

Text: KavyaTarang by Dr.Niranjan

Publisher: Jawahar Pustakalaya,SadarBazar,

Mathura,U.P, Pin Code:281001

Topics to be Covered:

1. Maithilisharan Gupt
2. Mahadevi Varma
3. Gajanan Madhav Mukthibodh
4. Agney
5. Nagarjun

Unit –II

History of Hindi Literature(Modern Period)

Text: Hindi Sahitya Ka Sankshipth Ithihas

Published by Kendriya Hindi Sansthan, Agra

Topics to be covered: Adhunik Kal

Unit-III

Prosody & Poetics

Text: Ras, Chand, Alankar by Viswambar Mannar,

Lokbharathi Prakashan, 15-A,

Mahatma Gandhi Road, Allahabad-3

Topics to be covered:

Ras- Nav Rasas,

Chand- Doha, Soratha, Choupai Barvai, Malini

Alankar- Upama, Utpreksha, Anupras, Yamak, Slesh, Vakrokthi.

Unit –IV

General Essay

Topics to be Covered:

1. Bharath Ekata
2. Aapka Priy Pustak
3. Aapka Priy Lekhak
4. Sthree Shiksha

5. Dahej Pratha

6. Cinema

7. Television

Unit-V

Administrative Hindi

Text: Vyavharik Hindi Aur Rachana by Dr. Krishnakumar Goswami

Publisher: Vani Prakashan, 21-A Dariyaganj, New Delhi-110002

Topics to be Covered: Administrative and Banking Hindi Technical Terminology used in the field (Fifty words to be taught)

Question Paper patter for all the semesters are same as follows:

Part A

Ten multiple choice questions. (1x10=10) Marks

Part B

Five out of Eight questions. (5x5=25) Marks

Part C

Five out of Eight questions. (8x5=40) Marks

APPENDIX – AZ2

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI -12

B.Com with Computer Application

II-Semester

Components		Hours	Credits
Part-I-	Tamil/Other Language (1 Course)	6	3
Part-II-	English (1 Course)	6	3
Part-III-	Core Subjects (2 Courses)	5	4
	Financial Accounting II Business Management	5	4
Allied Subject - (1 Course) Theory -4hrs Office Automation Practical – 2hrs		6	5
Value Based Education	(1 Course)	2	2
Total	(6 Courses)	30	21

I B.Com(computer Application)

(II Semester)-Under CBCS

PART III-Allied Subject (One Course)

Aim:

The aim of the paper to gain fundamental knowledge Of Office automation package

Objective:

- To know the Application of computer in office.
- To know Method of doing simple calculation using spread sheet
- To Make Presentation in Power point and Store data Using Access

Unit – I Introduction to Office

Introduction to Office 2000- Opening and closing office programs –Microsoft Office –Shortcut Keys-tool bars-Customizing Office Application-Files and Folders-Configuring printers-Installation programs.

UNIT- II Ms-Word

Creating a document – Copying and moving text – Formatting the document (Font, Paragraph, Bullets & Numbering, Page Setup). Inserting Page breaks – Page Numbers – Margin – Application of Header & Footer. Creating Tables – Entering Text – Formatting table – Using Formulas. Mail Merge – Letter – label – Envelope

UNIT-III Ms-Excel

Introduction to electronic Spread sheet-excel 2000. Basics creating and saving a workbook-entering data into work sheet within (manual-Automatic)-basic formatting-Basic Excel function-Chart [various types].

UNIT-IV Ms- PowerPoint

-Create a new presentation using Blank presentation – Formatting text and applying designs and background of slide. Create a new presentation using Templates – Apply Custom animation, Slide Transition, Sound effect – View show. Create a new presentation using Auto Content Wizard .

UNIT-V Ms- Access and Tables

Creating a New Blank databases - Creating table – Field size – Caption – Data types - Indexed Unicode – Compression – Decimal places. Modifying Tables - Modifying Field Property.

Text Book:

Office 2000:the complete reference ,stepen L.Nelson

Reference:

1. Vikas Gupta, Comdex Computer Course Kit (XP Edition), Dreamtech publish, Delhi
2. Fndamentals of computing C Programming and MS office,Alexis Leon ,Mathews Leon,Chitra,jeyarai,Vijay Nicole Private Limited

OFFICE AUTOMATION-PRACTICAL

MS Word

a. Text Manipulation

Changing the font size and type
Aligning and justification of text
Underlining the text
Indenting the text

- i. Prepare a Bio-data
- ii. Prepare a Letter

b. Usage of numbering, bullets, footer and headers

- i. Prepare a document and Auto format
- ii. Prepare a document with built , footers and headers

- c. Tables and Manipulations
 - i. Create a Calender and auto format
 - ii. Create a Marksheet-using table
 - iii. Picture insertion and alignment
- d. Mail Merge Application

M.S Excel

- i. creating and saving Excel sheet
- ii. Usage of formulas and built-in functions
- ii. Describe the type of function
- iii. Data Sorting
- iv. Mark sheet preparation
- v. Inserting Chart

M.S Power point

- i. Creating and saving Presentation
- ii. Prepare a presentation of your own

M.S Access

- i. Creating database of your own
- ii. Modify table content in database

MODEL QUESTION PAPER

OFFICE AUTOMATION

1. What is the short cut key to open the Open dialog box?

- A) F12
- B) Shift F12
- C) Alt + F12
- D) Ctrl + F12

2. How many ways you can save a document?

- A) 3
- B) 4
- C) 5
- D) 6

3. Which of the following is not a type of page margin?

- A) Left
- B) Right
- C) Center
- D) Top

4. What happens when you press Ctrl + X after selecting some cells in Excel?

- A) The cell content of selected cells disappear from cell and stored in clipboard
- B) The cells selected are marked for cutting
- C) The selected cells are deleted and the cells are shifted left
- D) The selected cells are deleted and cells are shifted up

5. The number of rows in a worksheet is

- a. 36500
- b. 65536
- c. 256
- d. 64536

6. To move to the previous worksheet press

- a. Ctrl+PgUp
- b. Ctrl+PgDn
- c. Shift+Tab
- d. Ctrl+Tab

7. What is an intersection of a row and a column?

- A. Form
- B. Cursor
- C. Cell
- D. Record

8. Which short cut key inserts a new slide in current presentation?

- A) Ctrl+N
- B) Ctrl+M
- C) Ctrl+S
- D) All of above

9. To start slide show of a presentation

- A) Hit F5 key
- B) From Slide Show menu choose View Show option
- C) From Slide Show menu choose Rehearse timing
- D) Both a & b

10. Which is the valid data type in Access?

- A. Number
- B. Text
- C. Currency
- D. All of the above

PART-B(5X5=25)

Answer all the Question, Choosing either (a) OR (b)

11 a.) How will you opening and closing office program

OR

b.) Short notes on Customizing youe Application

12 a) what are the way to copy and moving text in M.S Word

OR

b) What are steps to crating table in M.S Word Application?

13 a) How will you crating and saving Worksheet in M.S Excel Application?

OR

b) Short notes on some Basic Formatting in your Excel Sheet

14 a) How will you apply deigns in Background of Slide

OR

b) How will you apply custom animation in your Power point Presentation?

15 a) what are steps to creating databases in M.S Access?

OR

b) How will you Modifying tables in M.S Access?

PART-B(5X8=40)

Answer all the Question, Choosing either (a) OR (b)

16a) Explain what are toolbars available in Office Window

OR

b) Brief Explanation about Files and Folders

17a) what are way of Formatting the Word Document?

OR

b) Brief Explanation about Header and Footer

18 a) what are the Basic function in M.S Excel

OR

b) Explain various type of Chart in Excel

19 a) Explain steps to apply customize animation in your PowerPoint

OR

b) How will you creating new presentation using Auto content Wizard ?

20 a) Explain some basic Data types in M.S Access

OR

b) How will you Modify field property in Access Table

APPENDIX – AZ3

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI – 12

Department of Library & Information Science

B.L.I.Sc

(Bachelor of Library and Information Science)

2012 – 2013

Second Semester

Sl. No.	Paper	Marks		Total
		Internal	External	
1	Information Sources & Knowledge Analysis	25	75	100
2	Information Technology	25	75	100
3	Library Automation And Networking	25	75	100
4	Information Technology (Lab)	25	75	100
5	Field Work			100

Core Subjects 3 3 X 6 hours = 18 hours = credits 3 X 5 = 15

Lab 1 1 X 6 hours = 6 hours = credits 1 X 5 = 5

Field Work 1 1 X 6 hours = 6 hours = credits 1 X 4 = 4

24

SEMESTER – II

1. INFORMATION SOURCES & KNOWLEDGE ANALYSIS

Objectives

1. To enable the students acquiring knowledge regarding various sources of information sources and services
2. To enable the students apply their knowledge in the concerned programme

Unit – I

Concepts of data, information and knowledge. What and why of IKO. Information and Knowledge Access (IKA) Systems - their objectives and goals. Knowledge entities - documents, knowledge creators and users, databases, etc. Capturing, characterizing, representing and organizing information about knowledge entities.

Unit - II

Sources of information - Documentary and Non Documentary Sources, Types of Information Sources - Primary, Secondary and Tertiary Sources, Categories of information Sources, Types of information services: Reference / Referral Service, User Education, CAS, SDI, User Awareness Programme, Documentation Service, E-mail Alert Service, etc.

Unit – III

Metadata and its uses. Document description. Document description languages, vocabulary control. Subject languages. Classifications, taxonomy and thesauri.

Unit – IV

Design principles and standards. Applications in different IKA systems (DLs, websites, IOA systems, portals, etc.).

Unit – V

Automated systems. Formats and protocols for document interchange, descriptive and structural markup, semantics (MARC, IS02709, AACR, CCF, HTML, XML, RDF, OAI).

References

1. Louis Rosenfeld and Peter Morville. Information Architecture for the World Wide Web. O'Reilly & Associates, 1998.
2. Elaine Svenonius. The Intellectual Foundation of Information Organization. MIT Press, 2000.
3. Cheney, "Fundamental Reference Sources", Chicago: ALA, 1971.

2. INFORMATION TECHNOLOGY

Objectives

1. To know the basic concepts of Information technology
2. To train the students in applying Information technology in Libraries and information centers.
3. To understand the concepts of networking and web technology.

Unit – I

Information Technology: Components – Impact of IT on Society – Application of IT in libraries and Information centers – computer technology : Input, output and storage devices.

Unit – II

Software: Definition, System Software and Application Software, System Software: Operating Systems, Translators, Loaders, Assemblers, etc. Application Software: Ms Office, CDS/ISIS, SOUL, etc.

Unit – III

Communication Technology: Tele communication – Transmission media: Switching, Bandwidth Multiplexing, Modulation protocols – Wireless communication.

Unit – IV

Communication Tools and Techniques: Fax, Tele conferencing, Video conferencing, teletext, videotext and bulletin board services

Unit – V

Web technology: Web browser, Search engines, Hypertext, Hypermedia and Multimedia - Integrated services: Digital Network (ISDN)

References :

1. Bose Sanjay, K. Hardware and Software of Personal Computers, New Delhi, Wiley Eastern, 1991.
2. Mahpatra, P.K. The computer in Library Service, Calcutta, Word Press, 1985.
3. Basandra, K. Computers Today, New Delhi, BPB, 1998
4. Subramanian, N. Introduction to Computers: Fundamentals of computer science, New Delhi, Tata Mc Graw – Hill, 1990.

3: LIBRARY AUTOMATION AND NETWORKING

Objectives

1. To enable the students acquire knowledge regarding overview of Library Automation and Networking
2. To enable the students apply their knowledge in the Automation & Networking

UNIT 1:

Library Automation – Definition, need and importance of library automation, software/hardware selection for automation. Modules in SOUL.

UNIT 2:

Automation of Acquisition & Serials Control.

UNIT 3:

Automated Cataloguing System, Document Delivery (circulation) and Online Public Access Catalogue (OPAC).

UNIT 4:

Digital Library- Greenstone and D-space – General features

UNIT 5:

Types of Networks- Local Area Network (LAN), Metropolitan Area Networks (MAN), Wider Area Networks (WAN)—Internet & Intranet ; Library networks- INFLIBNET, INFONET & DELNET.

Reference:

1. Reynolds, D. 1984."Library Automation: issues and application ", New York: Bowker & Co.
2. Luck Tedd,"Introduction to computer based library system", Hyden, 1977.
3. Rao, Ravichandra, I.K., "Libray Automation", New Age International publishers, 2nd ed (1996).
4. Lovecy, Ian," Automating Library Procedures: a survivors handbook", D.K. Publisher (Library Association London), New Delhi, 1992

4. Information Technology (LAB)

MS – Office
MS- DOS
MS- Windows
CDs / ISIS
SOUL
Digitization

5. FIELD WORK

Objectives

1. To enable the students to have firsthand experience by working in various libraries and information centers.
2. To enable the students to develop enough competence and leadership qualities.
3. To enable the students in developing interpersonal relationship and communication skills.

Mode:

1. The leading libraries and information centers in and around Tirunelveli, Kanniakumari and Tuticorin Districts are to be identified.
2. The students are grouped based on the number of available libraries, which can give training to the students.
3. The group will go to various libraries hence could work and observe the practices of all libraries.

Duration

Field work is given in the last semester the students will work for two days in a week in any one of the selected libraries. They spent 120 hrs in the whole semester for field work programme.

Evaluation Criteria:

1. Submission of observation record	40
2. Conducting group Programmes	20
3. Evaluation by the librarians	15
4. Viva – Voce	25
Total Marks	100

APPENDIX - AZ4

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI – 12

UGC - CAREER ORIENTED PROGRAMME

CERTIFICATE COURSE IN ENTREPRENEURSHIP (COMMERCE)

(FOR THOSE WHO JOINED THE COURSE FROM THE

ACADEMIC YEAR 2012- 2013)

Basic Qualification/ Norms to handle the Certificate Course in Entrepreneurship (Commerce)

Eligibility: Pass in +2 Examination or any other equivalent course

The faculty members handling UG & PG Courses in Commerce may be allowed to handle the papers for Certificate Course in Entrepreneurship (Commerce).

Question Paper Pattern – Duration: 3 Hours

Part A: 10 X 1 = 10 Marks

Part B: 5 X 6 = 30 Marks

Part C: 5 X 12 = 60 Marks

Part A: Objective Type Questions

Part B & Part C: Explanation Questions with Internal Choice

CERTIFICATE COURSE IN ENTREPRENEURSHIP (COMMERCE)

Sl.No.	Title of the paper	No. of Credits	Contact Hours	Minimum Marks	Maximum Marks
1.	Entrepreneurship- An Introduction	6	90	40	100
2.	Institutional Finance to Entrepreneurs	6	90	40	100
3.	Project Work	8	120	40	100
	Total	20	300		

ENTREPRENEURSHIP (COMMERCE)
SYLLABUS

Paper I	:	Entrepreneurship – An Introduction
Paper II	:	Institutional Finance to Entrepreneurs
Paper III	:	Project Work – (Internal Evaluation) (Project Report 75 Marks Viva Voce – 25 Marks)

Paper I: Entrepreneurship – An Introduction

- Unit I :** Meaning – Definitions – Development – Functions – Importance – Barriers – Types - Nature and importance of Entrepreneurship
- Unit II :** Entrepreneur Development Programmes – Objects – Process – Phases – Institutions.
- Unit III :** Concept of Women Entrepreneurs – Factors influencing Women Entrepreneurs - Types of Women Entrepreneurs – Male Entrepreneurs VS Female Entrepreneurs – Women Entrepreneurs in India.
- Unit IV :** Entrepreneurial Motivation – Characteristics of a successful Entrepreneur – Competency requirement for entrepreneurs – Motivation – Motivation Theories – Motivating factors.
- Unit V :** Types of Industries – Small Scale – Tiny – Ancillary – Cottage Industries.

Reference:

Entrepreneurial Development – Dr.Radha, Prasanna & Co. Chennai.
Entrepreneurship Development in India – Dr. C.B.Gupta, Dr.N.P. Srinivasan, Sultan Chand & Sons, New Delhi.
Entrepreneurship Development – E.Gordon and K.Nataragan, Himalaya Publications, New Delhi.

Paper II: Institutional Finance to Entrepreneurs

Unit I : Institution & Schemes of Govt. Of India – NABARD – IDBI – IFCI – ICICI - EXIM Bank – ECGC

Unit II : Institutions and Schemes of Tamil Nadu – State level Financial Corporations – SIDCO – TN Women Development Corporation – TN Adi Dravidar Housing Development Corporation.

Unit III : DIC- DRDA – Local Bank – Rules – Schemes and Programmes

Unit IV : Training organisations of schemes for Entrepreneurs

Unit V : Incentives and Concessions to Entrepreneurs

Reference:

Entrepreneurial Development – Dr..Radha, Prasanna & Co. Chennai.

Entrepreneurship Development in India – Dr. C.B.Gupta, Dr.N.P. Srinivasan, Sultan Chand & Sons, New Delhi.

Entrepreneurship Development – E.Gordon and K.Nataragan, Himalaya Publications, New Delhi.

Paper III: Project Work (Minimum 35 pages)

(Internal Evaluation)

(Project Report 75 Marks)

(Viva Voce – 25 Marks)

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APPENDIX – AZ5

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI – 12

UGC CAREER ORIENTED PROGRAMME

CERTIFICATE COURSE IN TAX PROCEDURE AND PRACTICE

(FOR THOSE WHO JOINED THE COURSE FROM THE

ACADEMIC YEAR 2012 - 2013)

Basic Qualification / Norms to handle the Certificate Course in Tax Procedure and Practice

Eligibility: Pass in +2 Examination or any other equivalent course

The faculty members handling UG & PG Courses in Commerce may be allowed to handle the papers for Certificate Course in Tax Procedure and Practice.

Question Paper Pattern – Duration: 3 Hours

Part A: 10 X 1 = 10 Marks

Part B: 5 X 6 = 30 Marks

Part C: 5 X 12 = 60 Marks

Part A: Objective Type Questions

Part B & Part C: Explanation Questions with Internal Choice

CERTIFICATE COURSE IN TAX PROCEDURE AND PRACTICE

Sl.No.	Title of the paper	No. of Credits	Contact Hours	Minimum Marks	Maximum Marks
1.	Introduction to Income Tax	6	90	40	100
2.	Computation for Tax	6	90	40	100
3.	Practical Paper	8	120	40	100
	Total	20	300		

Tax Procedure and Practice – Paper I

Introduction to Income Tax

- Unit I :** Basic concepts – Agricultural Income – Person – Assessee – Assessment year – Income – Previous year – Capital and revenue receipts and expenditure
- Unit II :** Residential status for individual and HUF – Scope of total income – Exempted income U/S 10
- Unit III :** Computation of income under the head salaries – (Simple problems)
- Unit IV :** Computation of income under the head income from house property – (Simple problems)
- Unit V :** Computation of income under the head Profits and Gains from business or profession – (Simple problems)

Reference Books

1. Taxman's Direct Taxes, Law & Practice – Dr.Vinod Singhanian
2. Direct Tax Law – Manoharan TN
3. Income Tax Laws & Practice, Sahitya Bhawan Publications – H.C.Mehrotra
4. Income Tax Law & Practice, Vijay Nicole Imprints Private Limited – N.Hariharan
5. Income Tax Law & Practice, Sri Venkateswara Padmavathi Publications – K.Rajavelu
6. Income Tax Law & Practice, Kalyani Publishers – V.P.Gaur, D.B.Narang

Tax Procedure and Practice – Paper II

Computation for Tax

- Unit I :** Computation of taxable income under the head Capital gains – Simple problems – Capital Asset – Long term & Short term Capital gain – Exemptions U/S 54
- Unit II :** Computation of taxable income under the head income from other sources
- Unit III :** Deductions U/S 80
- Unit IV :** Set off and carry forward of income – Clubbing of income
- Unit V :** Income tax rates for individual assessee – Assessment of taxable income of individuals

Reference Books

1. Taxman's Direct Taxes, Law & Practice – Dr.Vinod Singhania
2. Direct Tax Law – Manoharan TN
3. Income Tax Laws & Practice – H.C.Mehrotra
4. Income Tax Law & Practice, Vijay Nicole Imprints Private Limited – N.Hariharan
5. Income Tax Law & Practice, Sri Venkateswara Padmavadhi Publications – K.Rajavelu
6. Income tax Law & Practice, Kalyani Publishers – V.P.Gaur, D.B.Narang

Tax Procedure and Practice – Paper III Practical Paper

- Unit I :** Residential status for individual and HUF
- Unit II :** Computation of income under the head, Salaries
- Unit III :** Computation of income under the head income from house property
- Unit IV :** Computation of taxable income under the head income from other sources
- Unit V :** Deductions under section 80 - Set off and carry forward of income – clubbing of income.

Reference Books

1. Taxman's Direct Taxes, Law & Practice – Dr.Vinod Singhania
2. Direct Tax Law – Manoharan TN
3. Income Tax Laws & Practice – H.C.Mehrotra
4. Income Tax Law & Practice, Vijay Nicole Imprints Private Limited – N.Hariharan
5. Income Tax Law & Practice, Sri Venkateswara Padmavadhi Publications – K.Rajavelu
6. Income tax Law & Practice, Kalyani Publishers – V.P.Gaur, D.B.Narang

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APPENDIX - AZ6

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12

UGC-CAREER ORIENTED PROGRAMME
CERTIFICATE COURSE IN **RUBBER TECHNOLOGY**

(FOR THOSE WHO JOINED THE COURSE
FROM THE ACADEMIC YEAR 2012-2013)

Certificate course in **RUBBER TECHNOLOGY**

The faculty members handling **UG course in Chemistry** may be allowed to handle the papers for **certificate course in Rubber Technology**

Question paper pattern :

Duration 3 Hours

Part- A 10x1=10 Marks

Part- B 5x6=30 Marks

Part – C 5x12=60 Marks

Part – A Objective Type Questions

Part – B & Part – C – Explanation Questions with internal choice

Eligibility: Passed in +2 Examination or any other equivalent course

Title of the Paper	No. of Credits	Contact Hours	Minimum Marks	Maximum Marks
Treatment of Rubber Latex	6	90	40	100
Latex Products	6	90	40	100
Projects on Rubber Technology	8	120	40	100
Total	20	300		

RUBBER TECHNOLOGY

SYLLABUS

Paper I : Treatment of Rubber Latex.

Unit I

Historical development of *Hovea Brasilensis* in to commercial source of NR. Availability of natural rubber in Kerala Tamil Nadu especially in Kanyakumari district. Scope for rubber industries in Kanyakumari district.

Unit II

Plantation – Rubber tree – its propagation – planting and plantation maintenance.

Unit III

Rubber tapping collection of latex. Composition of Latex – preservation of Latex. Latex Concentration centrifuging – creaming preservation of Latex.

Unit IV

Principles of pre-vulcanization-methods of pre-vulcanization properties of pre-vulcanized latex advantages of pre-vulcanization. Use of pre-vulcanized latex in different products.

Unit V

Vulcanizing agents; accelerators; Antioxidants Fillers and Pigments. Surface active agents including wetting agents dispersing agents stabilizers, emulsifiers foam promoters.

Paper II: Latex Products

Unit I

Latex gloves – different types of latex gloves – Manufacturing process surgical and house hold gloves.

Unit II

Latex foam-manufacture- Dunlop and Talalay processes frothing – refining – foam stabilization – fibre foam - coir foam.

Unit III

Latex adhesives – introduction – choice of polymer – Adhesion promoters plasticizers fillers – thickeners. Paper and leather adhesives based on NR.

Unit IV

Latex thread – Introduction elastic thread manufactures – Types of elastic thread – Latex thread by extrusion.

Unit V

Latex based surface coatings – latex in paper – latex in cement compositions. Ornamental products from latex.

Project

Code No. RTPP

APPENDIX - AZ7

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI -12

UGC – Career Oriented Programme

Certificate Course on Maintenance of Electrical and Electronic Equipments

(For those who joined the Course from the academic year 2012-2013)

ELIGIBILITY: *Any first level degree with +2 level (i) Science group (or) (ii) Vocational Engineering group.*

Basic qualification for the lecturers to handle the course: (i) *M.Sc., Physics, or*
(ii) *M.Sc., Electronics*

Subject Code	Name of the Paper	No. of Credits	Contact Hours	Min Marks	Max Marks
Theory papers	Fundamentals of Electricity	6	90	40	100
	Basic Electronics	6	90	40	100
Practical		8	120	40	100
Total		20	300		300

Question Paper Pattern

Part A : 10 X 1 = 10 marks (Objective type)

Part B : 5 X 6 = 30 marks (Internal choice)

Part C : 5 X 12 = 60 marks (Internal choice)

Duration : 3 hours

SYLLABUS FOR CERTIFICATE COURSE IN MAINTENANCE OF ELECTRICAL AND ELECTRONIC EQUIPMENTS

Fundamentals of Electricity

UNIT I : Electricity

Basic Definitions – current – voltage – ohm's law – Kirchoff's law – DC and AC – Period – frequency – rms value

UNIT II : Electric Circuits

DC and AC circuits – simple Electric circuits – open circuit – closed circuit – short circuit – series circuit – parallel circuit.

UNIT III : Simple devices

Fuse and its types – switches – various types – slide switch – rotary switch – push button switch – toggle switch – two way switch – plugs – Transformers – step up and step down transformers.

UNIT IV : Electrical measuring instruments

Operating principles of moving coil and moving iron instruments –voltmeter – Ammeter – wattmeter – Energy meter – Frequency meter – multimeter.

Unit V : Paying for Electricity and safety measurements

Electric power – Practical unit of electricity – Using and paying for electricity – Electrical shock – precautions to avoid shock – shock treatment.

Books for Reference :

1. Electrical and Electronics Instrument and measurements – A. K. Shawney, Publisher- Dhanpat Rai and Co.
2. Mahmood Nahvi and Joseph A.Edminister, "Electric Circuits", Schaum Outline Series, McGraw Hill(2002)
3. Keith Johnson- Physics for you- Part II first edition.
4. Basic Electrical Engineering- A.L.Anwani and I.Anwari, 2003, Dhanapat Rai and Co.(P)Ltd., Delhi.
5. Principle of electrical – B. L. Theraja

Basic Electronics

UNIT I : Basic Components used in Electronic Circuits

Resistors – color code – fixed and variable resistors – carbon film, metal film and wire wound resistors – presets – potentiometers.

Capacitors – fixed and variable capacitors- polyester, paper, mica, ceramic and electrolytic capacitors - inductor and rf coils

UNIT II : Electronic Devices

Loud speaker – microphone – relays – concept of make and break in relays- Operating current - holding current –various types of relays and their symbols, specifications and applications – various types of connectors and their functions – specifications and applications.

UNIT III : Semiconductor Devices I (Qualitative only)

pn junction diodes – Different types of diodes – brief idea and typical applications of power diodes, zener diodes, varactor diodes and point contact diodes – VI characteristics of PN – junction diode – Half wave and Full wave rectifier – Bridge rectifier – Applications of triac, SCR and UJT – Regulated power supply.

UNIT IV : Semiconductor Device II

Bipolar junction transistor – npn and pnp transistors – mechanism of current flow in transistors – concept of power gain as product of voltage gain and current gain – Basic idea about JFET and MOSFET.

Unit V : Opto-electronic Devices and their Application

Working principles and characteristics of photo resistors, photo diodes, photo transistors, LEDs, LCDs and optical coupler, Simple applications of opto electronic Devices.

Books for Reference:

1. Mehta V.K, Principles of Electronics, S.Chand and Company Ltd.(1994)
2. Electronic devices and circuits - Salivahanan
3. John D.Ryder, Electronic Fundamental and application – Prentice Hall
4. Power Electronics – P.S. Bhimbhara – Khanna publishers.

Practical I

1. To measure the voltage at various settings of a Battery eliminator and a Regulated power supply using
 - (i) Analog multimeter
 - (ii) Digital multimeter
 - (iii) CRO
2. To measure the voltage and current of
 - (i) A Regulated power supply
 - (ii) A battery eliminatorfor various loads.
3. To practice the use of a signal generator and CRO by measuring dc and ac voltages, time period/frequency and phase.
4. To identify and familiarize with the resistors by measuring the resistance values with ordinary multimeter and digital multimeter and then verify the values on the basis of colour codes
5. To practice on the wiring of switches and plugs and replacement of fuses.
6. To practice on fluorescent lamp wiring.
7. To find the electrical fault in instruments like Iron box, Ceiling fan, table, wall mounting fans, and motors (low horse power).
8. To find the fault in chokes of fluorescent lamps.

APPENDIX - AZ8

MANONMANIAM SUNDARANAR UNIVERSITY, Tirunelveli – 12

Certificate Course in Air Ticketing and Cargo Management under Career Oriented Programme

(For those who joined the Course from the academic year 2012 – 2013)

1. **Course: Certificate Course in Air Ticketing and Cargo Management**
2. **Medium of Instruction and Examinations: English**
3. **Eligibility for Admission:**

A candidate shall be eligible for admission to Certificate Course in Air Ticketing and Cargo Management if he/she is a student of any Under Graduate Degree.

4. Course structure

The name of the Papers, Credits, Contact Hours and Minimum and Maximum Marks for end semester examinations are listed below. The course content is given in the syllabus (Annexure I).

Sl. No	Sub. Code	Name of the Paper	Credits	Contact Hours	Marks	
					Min.	Max.
1		Air Ticketing	6	90	40	100
2		Cargo Management	6	90	40	100
3		Project	8	120	40	100
		Total	20	300		300

5. Examination

Pattern of Question Paper (Maximum 100Marks, 3 Hours)

Part A- Two Multiple Choice Questions from each unit for 1 mark each. (10 Questions)
10 marks

Part B- One Internal Choice Question from each unit for 6 marks each. (5 Questions) 30 marks

Part C- One Internal Choice Question from each unit for 12marks each. (5 Questions) 60marks

6. Project Work

The project work of the group that consists of 3 students will be evaluated based on the report submitted at the end of the certificate course. The performance of the group will be evaluated by the external examiner in the Viva-Voce examination for 40 marks. The external examiner will evaluate the report for 60 Marks.

The student will get pass in Project Work if s/he scores a minimum of 40 marks including report and Viva-Voce.

AIR TICKETING

Unit- I:

Map reading – Longitude and latitude, Continents of the world, Countries of the world – famous Destination. Time Zones – world time zones, the prime meridian, daylight saving time, International Date Line, Elapse travel time.

Unit- II:

Civil aviation – Introduction, history, domestic airlines, International airlines. Airlines in India – IATA, UFTA, FIATA, ICAO, etc. Codes – two character airline codes – three letter codes – cities and airports – line difference calculation of flights. Airline in-flight facilities and services – superior class – business class –club class – first class – supersonic class – passenger with special care.

Unit- III:

International travel formalities – Check in formalities – airport formalities – arrival formalities – departure formalities. Travel regulations – travel documents (passport – VISA – health documents etc.) - Customs – currencies – travel insurance.

Unit- IV:

Mileage system – Fare breaking point – Neutral unit of construction – Maximum permitted Mileage – Extra mileage allowance - Extra mileage surcharge - - higher intermediate point – Constructed Fare – check – basic haul – Circle trip, Minimum rate of exchange – Local selling fare – one way journey – definition, problems with EMA, EMS, HID, BHC – Return trip Journey – Definition – CT – RT – Problems with EMA, EMS, HID – Define CTM with problems – Filling of a ticket – Fare calculation Box.

Unit-V:

Air Fares and Ticketing – IATA Geography and Global indicators, International sales Indicators, Fare Selection, Currency Rule, Specified Routings, SITI One way and Return Fare Construction, Add – Ons, Mixed Class Fare, TFCs (Taxes, Fees and Charges), Children and Infants' Fares, Special Fares.

Reference Books:

1. Dennis L. Foster: An Introduction to Travel & Tourism.
2. Jagmohan Negi : Travel Agency & Tour Operation – Concepts & Principles.
3. Lonely Planet : The Travel Book – A journey through every country of the world.
4. IATA Foundation : IATA/UFTAA Travel and Tourism.

CARGO MANAGEMENT

Unit-I:

Cargo definitions – Cargo History and Common terms used in Cargo handling - Air Cargo, Marine cargo, Cargo Terminology, Cargo Trends and Forecasts.

Unit-II:

Cargo entities and Organization's use of Air Cargo Guides, Aircraft Types and ground support equipments.

Unit-III:

Cargo procedure – Identification of Cargo, air Cargo acceptance, cargo booking procedure, cargo Rates and charges, airway bill, restrictions in acceptance of cargo, cargo automation.

Unit-IV:

Handling – Cargo capacity of Air and Ships. Cargo needing special attention, introduction to dangerous goods regulations. Some important cargo companies.

Unit-V:

Cargo Agents and their functions, Cargo Agency Registration, Effective Cargo Claims Management.

Reference Books:

1. Surabhi Srivastava Manoj Dixit : Cargo Management : An international prospective.
2. Prem Nath Dhar : Global Cargo Management Concept, Typology, Law and Policy.
3. J Mark Rowbotham: Introduction to Marine Cargo Management.
4. Andrew S. Jakes and : Cargo Movers and their Revenue
5. Alan S. Kahann: Potential for the People Mover Industry.

APPENDIX - AZ9

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

Syllabus for the Certificate course on
“Computational Biology”
Under UGC sponsored Career Oriented Programme
(For those who joined the Course from the academic year 2012-2013)

Eligibility: Science stream students of UG / PG

Duration: One year non semester

Course Plan:

Name of the Paper	No of credits	Contact hours	Min marks	Max marks
Theory Papers				
Molecular Biology & Genetic Engineering	4	60	40	100
Computational Methods for Sequence Analysis	4	60	40	100
Practical Paper				
Practical-1	4	90	40	100
Project				
Project	8	90	40	100
Total	20	300		400

- ❖ Examination at the end of the academic year
- ❖ No internal examinations

Syllabus for Certificate Course in Computational Biology

Theory Papers:

Paper - 1:

MOLECULAR BIOLOGY & GENETIC ENGINEERING

UNIT –I

DNA: Structure, Replication: eukaryotes, Repair-different methods & Recombination- different methods, Nucleic acids – structure, function and properties, A-,B-,Z- and triplex DNA. Mutation – Types of mutations.

UNIT – II

Mechanism of DNA polymerase- DNA synthesis at the replication fork, initiation of DNA replication. RNA polymerase structure and assembly; RNA polymerase I, II, III; Eukaryotic promoters and enhancers; Processing of mRNA, tRNA, rRNA; 5'-Cap formation; 3'-end processing and polyadenylation; Splicing; RNA editing;

UNIT – III

Tools in rDNA technology: Restriction endonucleases and other enzymes used in recombinant DNA technology - Cloning vectors - Plasmid cloning vector pBR322, plasmid vectors, Bacteriophage vectors - Cosmids, Phagemids - YAC and BAC vectors – Genetic transformation of prokaryotes - Transferring DNA into *E. coli* – Chemical induction and Electroporation.

UNIT – IV

Primers; Fidelity of thermostable enzymes; Types of PCR – multiplex, nested, reverse transcriptase, real time PCR, colony PCR; Proof reading enzymes; PCR in molecular diagnostics; Viral and bacterial detection; PCR based mutagenesis, Mutation detection: SSCP, DGGE.

UNIT – V

DNA sequencing – Chemical cleavage and dideoxy methods-Automated DNA sequencing –Next generation sequencing. **Applications:** Southern and Northern blotting –DNA Diagnostic system - random amplified polymorphic DNA (RAPD), RFLP, DNA finger printing, their applications – Transgenic animals.

REFERENCES:

1. Watson, J. D. , Tania A. Baker, Stephen P. Bell, Alexander Gann, Michael Levine, Richard Losick, "Molecular Biology of the Gene", Benjamin Cummings, London, 3rd Edition, 2003
2. Weaver, R.F., Hedrick, P.W., "Molecular Biology", William C. Brown, Illinois, 5th Edition, 2003
3. Malacinski G.M., Freifelder D., "Essentials of Molecular Biology", Jones & Bartlett Pub, Boston, 4th Edition, 2002
4. Primrose, S.B., Twyman, R.M., Bob Old, "Principles of Gene Manipulation and Genomics", Blackwell Publishing, 7th Edition, Boston, 2006
5. James Watson, Jan Witkowski, Myers Richard, Amy Caudy, "Recombinant DNA: Genes and Genomics; A short course", F.H. Freeman, San Francisco, 3rd Edition, 2006
6. Bernard R. Glick & Jack J. Pasternak, "Molecular Biotechnology", ASM Press, Washington, 3rd Edition, 2003
7. Joseph Sambrook & David W. Russel, "Molecular Cloning", Cold Spring Harbor Laboratory, New York, 3rd Edition, 2001
8. Robert F. Weaver, "Molecular Biology", MGH Publication, London, 5th Edition, 2005
9. Grosveld, F., Kollias, G., (Eds), "Transgenic Animals", Academic Press, New York, 1st Edition, 1992

Paper - 2:

COMPUTATIONAL METHODS FOR SEQUENCE ANALYSIS

UNIT-I

Introduction to bioinformatics: Definitions and concepts, Emergence of bioinformatics as a separate discipline. Classification of biological databases: Primary nucleotide sequence databases (EMBL, GenBank, DDBJ), secondary nucleotide sequence databases (Unigene, SGD), Protein sequence databases (SwissPro, TrEMBL, PIR) and Protein structure databases (PDB, SCOP, CATH).

UNIT-II

Introduction to Sequence alignment. Substitution matrices, Scoring matrices – PAM and BLOSUM. Local and Global alignment concepts, Dot plot. Dynamic programming methodology: Needleman and Wunsch algorithm. Smith–Waterman algorithm. Multiple sequence alignment – Clustal W. Database search for similar sequences using FASTA and BLAST. Data retrieval using Entrez and SRS, ExpASy.

UNIT-III

Gene finding methods. Gene prediction: Fragment assembly, Genome sequence assembly, Restriction Mapping, Repeat Sequence finder, ORF. Biological data formats. Introduction to single letter code of aminoacids, codon usage, symbols used in nucleotides. Sequence polymorphisms – Types, dbSNP, ALFRED and JSNP.

UNIT-IV

Protein structure prediction – Secondary Structure Prediction: Chou and Fasman method and PHD. Transmembrane – TopPred and TMHMM. Tertiary Structure modeling: Homology modeling, threading, *Ab Initio* structure prediction, protein structure evaluation – SPDBV, Ramachandran plot. Visualizing proteins using Rasmol, SPDBV.

UNIT-V

Methods of phylogenetics analysis: Rooted and unrooted tree representation. Bootstrapping strategies, Distance matrix method – UPGMA and Neighbour method and Character-based methods – maximum parsimony and maximum likelihood. Phylogenetics software like MEGA

REFERENCES:

1. David Mount, “Bioinformatics: Sequence and Genome Analysis”,(1st Edition), Cold Spring Harbor Laboratory Press.
2. Andréa’s D. Baxevanis, B.F. Francis Ouellette, “Bioinformatics – Concepts, Skills, Applications, Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins” (2nd Edition), John Wiley & Son.
3. Teresa. K. Atwood and David J. Parry-Smith. “Introduction to Bioinformatics”, Prentice Hall Publishers.
4. Arthur M. Lesk, “Introduction to Bioinformatics”, 1st Edition, Oxford University
5. Christopher Fall, Eric Marland, John Wagner, John Tyson, “Computational Cell Biology”, Springer.
6. Peter Clote and Rolf Backofen, “Computational Molecular Biology: An Introduction”, Wiley
7. Michael S. Waterman, “Introduction to Computational Biology: Maps, Sequences and Genomes”, CRC.

Practicals:

1. Isolation of DNA from prokaryotes
 2. Isolation of DNA from animal tissue
 3. PCR amplification
 4. Identification of DNA amplification using agarose gel
 5. Restriction enzyme analysis.
 6. Cloning (demonstration only)
 7. Identification of transformant (demonstration only)
 8. Internet access to software and databases
 9. Retrieving and analysis of protein and nucleic acids sequences,
 10. Converting sequences between different formats
 11. Detecting ORFs, Codon usage
 12. Protein sequence analysis (ExPASy proteomics tools).
 13. Multiple sequence alignment (Clustal W).
 14. Similarity search using BLAST
 15. Composition analysis,Hydrophobicity
 16. Transmembrane predictions;
 17. Molecular visualization- Rasmol, SPDBV-Basic operations.
 18. Boot strapping strategies. MEGA.
- ❖ Preparation of record and submission

Project:

- ❖ Group project - Maximum of five students
- ❖ Dissertation 50 + Viva voce 50 marks
- ❖ Project should not be wet lab oriented

Question Paper Pattern for Theory Papers:

Section	No. of questions	Marks	Total marks
Part-A	10	1	10
Part-B	5	6	30
Part-C	5	12	60

Part - A: Objective type questions

Part - B & C: Explanation questions with internal choice

Model Question Paper:

CERTIFICATE COURSE IN COMPUTATIONAL BIOLOGY

Non-Semester

Time: Three hours

Maximum: 100 marks

SECTION A - (10 × 1 = 10 marks)

Answer ALL the questions. Choose the correct answer.

1. The number of base pairs per complete turn of B DNA helix is
 - a) 8
 - b) 12
 - c) 10
 - d) 14
2. Complementary single strands can renature when the temperature is
 - a) high
 - b) increased
 - c) reduced
 - d) low
3. The point at which the parental strands are separated is called as
 - a) replication
 - b) Replication fork
 - c) DNA duplex
 - d) Prosite
4. The addition of poly A tail to the mRNA is catalyzed by _____ enzyme
 - a) DNA polymerase
 - b) RNA polymerase
 - c) Poly A polymerase
 - d) RNA A Polymerase
5. A cosmid is different from plasmid by the
 - a) Origin of replication
 - b) Extraphage DNA the cos site with 12 bases
 - c) Small size
 - d) Special cleavage site
6. Eco R₁ restriction enzyme is obtained from
 - a) B.Globigii
 - b) E.coli Rds
 - c) E.coli RY B
 - d) All the above
7. SSCP means
 - a) Single Strand Colony Polymorphism
 - b) Single Strand Common Protein
 - c) Single Strand Cytosine Polymorphism
 - d) Single Stand Comformational polymorphism
8. Transgenic animal is also called as
 - a) Molecular markers
 - b) Molecular materials
 - c) Molecular chemicals
 - d) Molecular farming
9. The name of the first transgenic pig is
 - a) Dolly
 - b) Babus
 - c) Astri
 - d) Snoopy

10. SSCP means
- e) Single Strand Colony Polymorphism
 - f) Single Strand Common Protein
 - g) Single Strand Cytosine Polymorphism
 - h) Single Stand Comformational polymorphism
11. Transgenic animal is also called as
- e) Molecular markers
 - f) Molecular materials
 - g) Molecular chemicals
 - h) Molecular farming
12. The name of the first transgenic pig is
- e) Dolly
 - f) Babus
 - g) Astri
 - h) Snoopy

SECTION B - (5 × 6 = 30 marks)

13. Briefly explain triplex DNA
or
Write short notes on Cot curves
14. Explain Splicing
or
Explain 5'-Cap formation
15. Write short notes on pBR322
or
Explain Electroporation.
16. Describe Polymerase Chain Reaction
or
Write an account on RT-PCR
17. Write short notes on Next generation sequencing
or
Write an account on Transgenic animals

SECTION C - (5 × 12 = 60 marks)

18. Write an account on different types of DNA repair mechanism in eukaryotes.
or
Write an account on types of mutation.
19. Differentiate the different types of RNA polymerases
or
Explain RNA editing with examples
20. Give an account on Bacteriophage vectors.
or
Write an account on genetic transformation of prokaryotes.
21. Write an essay on Proof reading enzymes.
or
Write an account on PCR in molecular diagnostics
22. Describe the Western blotting technique as a molecular probe
or
Briefly explain the next generation sequencing

APPENDIX - AZ10

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI – 12

Certificate Course in Data Structure and Computer Algorithm under Career Oriented Programme

(For those who joined the Course from the academic year 2012-2013)

Eligibility: UG. I year (Non Computer Science stream only) students.

Examination at the end of the year.

Duration of Examination: 3 hours.

Question pattern: Part A ($10 \times 1 = 10$ marks) -objective type

Part B ($5 \times 6 = 30$ marks) -either or type

Part C ($5 \times 12 = 60$ marks) -either or type

Subjects	Title of the paper	No. of Credits	Contact Hours	Passing Min. Marks	Max. Marks
1	Theory: Introduction to IT and Office Automation	4	60	40	100
2	Theory: Data Structure	4	60	40	100
3	Theory: C Programming	4	60	40	100
4	Practical: C Programming	4	60	40	100
5	Practical: Office Automation	4	60	40	100
	Total	20	300		

PAPER 1

INTRODUCTION TO IT AND OFFICE AUTOMATION

Unit I

Introduction to Computers: Generation of Computers – Classification of Computers – Computer System.

Computer Languages: Classification of Programming Languages – Generation of Programming Languages – Features of Good Programming Languages.

Algorithm : Properties – Largest of Three numbers – Average of N numbers.

Flow chart : Symbols – Guidelines – Flowchart structures (Sequence, Selection & Repetition) – Limitations of Flowcharts.

Operating System: Definition – Evolution of Operating System - Types of Operating System – Functions of Operating System.

UNIT II

Word – Applying advanced formatting techniques: Formatting pages, Working with columns, Constructing high quality tables, Creating outlines in Word. Working with complex documents: Managing data with Word, Creating customized merge documents, Publishing online forms, Adding reference to documents, Working together on documents.

UNIT III

Excel: Creating Excel Worksheets: Entering and editing cell entries, Working with numbers, Changing worksheet layout, Other formatting options, Printing in Excel, Using functions and references, Naming ranges, Creating easy to understand charts, Using custom and special effects, Using financial and statistical functions, Tracking and analyzing data with excel, Auditing worksheets.

UNIT IV

PowerPoint: Creating PowerPoint presentations: Creating a basic presentation, building presentations, modifying visual elements. Formatting and checking text, Adding objects, Applying transitions, Animation effects and linking, preparing handouts, Taking the show on the road.

UNIT V

Access: Tracking data with Access: Planning and creating tables, Creating and using forms, Modifying tables, Working with external data, Creating relational database, Enhancing form design, Producing reports, Creating queries.

Text Book

1. Introduction to Computer Science, Second Edition, ITL Education Solutions Ltd, Pearson Education (Unit I)
2. COX, 2007 MICROSOFT OFFICE SYSTEM STEP BY STEP, Second Edition, PHI Learning Private Limited

Reference Book

Michael Price, In Easy Steps OFFICE 2007, Tata McGraw Hill Education Private Limited

PAPER 2

DATA STRUCTURE

Unit I

Introduction: Pseudocode-The Abstract Data Type-A Model for an Abstract DataType- Algorithms Efficiency.

Unit II

Searching: Linear Search – Binary Search.

Sorting: Bubble Sort - Quick Sort-Merge Sort.

Unit III

Stacks and Queues: Basic Stacks operations-Stack Linked List Implementation – Stack Applications-Queue operations.

Unit IV

Linked lists: Linear List Concepts – Linked List Concepts-Linked List Algorithms

Unit V

Trees: Basic Tree Concepts-Binary Trees- Binary Tree Traversals-Expression Trees-General Trees-Binary Search Trees.

Graphs: Terminology-Operations-Graph storage Structure-Graph Algorithms-Networks.

Text Book

DATA STRUCTURES A Pseudocode Approach with C++, Richard F. Gilberg & Behrouz A. Forouzan, THOMSON BROOKS/COLE

Reference Books

1. DATA STRUCTURES USING C AND C++, Yedidyah Langsam, Moshe J. Augenstein, Aaron M. Tenenbaum, PHI Learning Private Limited
2. Data Structures Using C++, Varsha H. Patil, Oxford University Press

PAPER 3

C PROGRAMMING

Unit I

Introduction to C: The C Character set – Identifiers and keywords – Data types – Constants – Variables and Arrays – Declarations – Expressions – Statements – Symbolic constants.

Operators and Expressions: Arithmetic Operators – Unary Operators – Relational and Logical Operators – Assignment Operators – The Conditional Operator – Library Functions.

Data Input and Output: Single character Input and Output – Entering Input and Writing Output Data – The Gets and Puts Functions.

Unit II

Control Statements: The if-else Statement – The While Statement – The Do-While Statement – The For Statement – Nested Control Structures –The Switch Statement – The Break Statement – The Continue Statement – The Comma Operator – The Goto Statement.

Unit III

Functions: Defining a Function – Accessing a Function – Function Prototypes – Passing Arguments to a Function – Recursion.

Program Structure: Storage classes – Automatic Variables – External Variables – Static Variables.

Unit IV

Arrays: Defining an Array – Processing an Array – Passing Arrays to a Function – Multidimensional Arrays.

Strings: Defining a string – NULL Character – Initialization of Strings – Reading and Writing a String – Processing the Strings – Character Arithmetic – Searching and Sorting of Strings.

Pointers: Pointer Declarations – Passing Pointers to a Function - Pointers and One Dimensional Arrays.

Unit V

Structures and Unions: Defining a Structure – Processing a Structure – User Defined Data types (typedef) – Structures and pointers – Passing Structures to a Functions - Unions.

File Handling: Opening and Closing a Data File – Reading and Writing a Data File – Processing a Data File.

Text Books

Programming with C, Third Edition, Byron S Gottfried, Tata McGraw Hill Education Private Limited (Unit II, Unit III, Unit IV and Unit V)

Reference Books

1. Computer Fundamentals and Programming in C, Reema Thareja, Oxford University Press
2. How to Program C, Sixth Edition, Paul Deitel and Harvey Deitel, PHI Learning Private Limited
3. Programming with ANSI and Turbo C, First Edition, Ashok N. Kamthane, Pearson Education

PRACTICAL 1
C PROGRAMMING

1. Write a C program to find all the possible roots of a Quadratic equation using switch statement.
2. Write a C program to evaluate the power series for a required accuracy
 $e^x = 1 + x + x^2/2! + x^3/3! + \dots + x^n/n!, 0 < x < 1$
3. Write a C program to arrange a set of numbers in descending order
4. Write a C program to search an element in an array
5. Write a C program to implement merge sort
6. Write a C program to find NCR using recursion.
7. Write a C program to multiply two matrices, if they are compatible.
8. Write a C program to check whether the given string is palindrome or not.
9. Write a C program to arrange the set of names in alphabetical order.
10. Write a C program to calculate the standard deviation for a set of numbers using function.
11. Write a C program to prepare the mark sheet using structure.
12. Write a C program to prepare the Pay Bill using file

PRACTICAL 2
OFFICE AUTOMATION

MS-WORD

1. Creating and Saving Documents
2. Letter Typing and Editing
3. Design an Invitation
4. Design a Calendar
5. Design a Time Table
6. Prepare a Student Bio-data
7. Usage of Header / Footer / Bookmark / Footnote / Spell Check
8. Mathematical Equations and Symbols
9. Design a Cover Page
10. Mail Merge

MS –EXCEL

1. Mark Sheet Preparation
2. Payroll Preparation
3. Sales Details
4. Graphs and Charts
5. Mathematical / Statistical / Logical Functions
6. Budget Preparation

MS –ACCESS

1. Mark List Creation
2. Salary List Preparation
3. Electricity Bill Generation
4. Report Generation
5. Creation of Mailing Labels

MS –POWER POINT

1. Creating a Presentation from Scratch
2. Creating a Presentation using Design Template
3. Creating an Animated Presentation with Sound Effect
4. Creating a Presentation about your Personality

APPENDIX – AZ11

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI - 12

Syllabus for Certificate course in Human Rights Education under UGC scheme of Human Rights Education

Eligibility:

A candidate shall be eligible for admission to Certificate Course in “Human Rights Education” if he/she has obtained pass in foundation course in Human Rights Education.

Structure of the programme : (Full-Time)

This Certificate course will consist of three Theory Papers.

Examination:

There will be one End-of course examination. A minimum of 40% marks in each paper is prescribed for a pass. The candidate who has not secured a minimum of 40% marks in all the papers will be deemed to have failed in that course.

Question Paper Pattern – duration 3 hours

Part A : 10 X 1 = 10 Marks
Part B : 5 X 6 = 30 Marks (Answer to be in 250 Words for each question)
Part C : 5 X 12 = 60 Marks (Answer to be in 500 Words for each question)
Part A : Objective Type Questions
Part B & Part C : Explanation Questions with Internal Choice.

Certificate Course in Human Rights Education

Theory	Title of the Paper	Contact Hours	No. of credits	Maximum marks
Core 1	Human Rights – A Historical Perspective	90	06	100
Core 2	Human Rights and Duties under Indian Constitution	120	08	100
Core 3	Human Rights and Group Rights	90	06	100
	Total	300	20	300

Paper 1 : INTRODUCTION TO HUMAN RIGHTS

- UNIT I:** Human Rights – Conceptual Setting – Meaning, Nature and Scope; Theories of Human Rights, Individual Vs Collective Rights – Classification.
- UNIT II:** Evolution of the Concept of Human Rights – Magna Carta – English Bill of Rights – American Declaration of Independence – French Declaration of the Rights of Man and Citizen.
- UNIT III:** Human Rights – Genesis – Universal Declaration of Human Rights – International Covenant on civil and Political Rights (ICCPR) – International Covenant on Economic, Social and Cultural Rights (ICESCR).
- UNIT IV:** Regional Instruments – American Declaration of Human Rights and Duties, 1948 – European Convention of Human Rights – African Charter.
- UNIT V:** Asian Perspective on Human Rights – Cultural Relativism Vs Universalism – World Conference on Human Rights – Vienna.

REFERENCE BOOKS:

1. V.R. Krishna Iyer – The Dialectics and Dynamics of Human Rights in India (Yesterday, Today and Tomorrow) Eastern Law House, 1999.
2. Chandra V. Human Rights
3. James R Lewis And Carl Skutsch, The Human Rights Encyclopaedia, Vol. 1, 2 and 3
4. Aswathi S.K. and Kakoria R.P. Law relating to Protection of Human Rights: Millennium Edition, Orient Publishing Company.
5. Dr. S. Mehertaj Begum, Human Rights In India, Issues and Perspectives Compiled.

Paper 2: HUMAN RIGHTS AND DUTIES UNDER INDIAN CONSTITUTION

- UNIT I:** Constitutional Guarantees on Human Rights – Fundamental Rights – PART III of The Constitution – Directive Principles of State Policy – Karachi. Declaration as a Fore Runner to UDHR and Indian Constitution.
- UNIT II:** Environmental Rights under the Constitution – Local Bodies – Urban and Rural – 73 & 74 Amendment Act.
- UNIT III:** Types of Writs – Writ jurisdiction under Article 32 and 226 of The Indian Constitution.
- UNIT IV:** Fundamental Duties Enshrined in the Indian Constitution – Growth of PIL in India.
- UNIT V:** Emergency Provisions and Human Rights – Non Derogable Provisions Under ICCPR – Effect of Forty Second And Forty Fourth Amendment of the Indian Constitution.

REFERENCE BOOKS

1. G.S. Pande – Constitutional Law of India, Allahabad Law Agency, Eighth Edition, 2002.
2. J.N. Pandey – Constitutional law of India, Central Law Agency, Allahabad, 2003
3. M.P. Jain – Indian Constitutional Law, Nagpur Wadhwa, 2003, 2 Volumes
4. Krishna Gupta – Social Equality and the Indian Constitution.
5. P.L. Mehata, Neena Verma – Human Rights Under the Indian Constitution.

Case Laws Involved:

Custodial Violence and Rights of Prisoners.

1. D.K. Basu V. State of West Bengal
2. Nilabati Behera V. State of Orissa
3. Rudul Shah V. State of Bihar

Capital Punishment

1. Mithu V. State of Punjab
2. T.V. Vatheeswaran V. State of Tamil Nadu
3. Sher Singh and others V. State of Punjab

Human Rights During Emergency

1. ADM Jabalpur V. Shivakant shukla
2. S.R. Bommal V. Union of India

Freedom of Religion

1. Bijoe Emmanuel V. State of Kerala
2. D.A. V. College V. State of Punjab

Paper 3: HUMAN RIGHTS AND GROUP RIGHTS

- UNIT I:** Definition of group rights – Individual vs. Collective rights, rights of the elders
- UNIT II:** Rights of Child – Convention of the Rights of the Child, 1989 – Rights of Juveniles – United Nations Standard Minimum Rules for the Administration of Juvenile Justice – Salient features of the Juvenile Justice Act, 2000.
- UNIT III:** Rights of Women – Convention on the elimination on all forms of discrimination against women (CEDAW) – Gender equality in the work place – Fourth World Conference on Women – Beijing.
- UNIT IV:** Rights of workers – Role of ILO as a standard setting mechanism – ILO convention on collective bargaining, freedom of association, worst forms of child labor; Rights of workers in International Bill of Rights – Bonded labor in India.
- UNITV:** Rights of minorities – Constitutional provisions regarding rights of minorities – Religious and linguistic minorities – Rights of minorities with respect to ICCPR – Rights of dalits.

REFERNCES:

1. Diwan, Paras and Peeyushi Diwan, Children and Legal Protection (New Delhi : Deep and Deep, 1994).
2. Khanna, S.K. Children and the Human rights (New Delhi: Commonwealth, 1998).
3. Bernardi, M.J. International Legal Instruments on the Health of children and women (Geneva, 1997).
4. Mishra, Jyostna, ed., Women and Human Rights (Delhi: Kalpaz Publications, 2000).
5. Mukhopadhyay, S., ed., In the Name of Justice: Women and Law in Society (New Delhi: Manohar, 1998).
6. Saxena, Shobha, Crimes against Women and Protective laws (New Delhi: Deep and Deep, 1999).

APPENDIX - AZ12

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI -12

CERTIFICATE COURSE IN ENERGY SCIENCE **Under UGC sponsored Career Oriented Programme** (For those who joined the Course from the academic year 2012-2013)

Eligibility: Science stream students of UG courses

Duration: One year non-semester

Components of the Career Oriented Course in Energy Science:

The career oriented course in Energy Science is multidisciplinary in nature. It has a *progressive approach*. The examinations will be conducted in the *annual system*. Students would have the option to take on the course under choice based credit system (CBCS). The students will be awarded with certificate, diploma or advanced diploma based on the credits earned by them. They would have the liberty to discontinue the course after the completion of Certificate or Diploma courses. Earning **20 credits is essential** for the award of a **certificate**.

Course Plan:

Name of the Paper	No. of credits	Contact hours	Min. Marks	Max. marks
Theory papers				
Paper 1. Fundamentals of Energy Systems	4	60	40	100
Paper 2. Energy resources, Economics and Environment	4	60	40	100
Practical				
Practical - 1	4	60	40	100
Project				
Project - 1	8	120	40	100
Total	20	300		400

Distribution of marks

Paper	Internal	External	Total
Theory	25	75	100
Practical	40	60	100
Project	100	-	100

Pass minimum of 40% for external and overall components.

Distribution of internal marks

Theory

The average of the best two from the three compulsory tests.	20 marks
Assignment	05 marks
Total	25 marks

Practical:

Experimental work- lab observation	20 marks
Record	10 marks
Model test	10 marks
Total	40 marks

Project:

Project report	75 marks
Viva voce	25 marks
Total	100 marks

Course structure for UGC Career Oriented Programme
Certificate Course in Energy Science

I Year

Components	Hours	Credits
Theory (2 courses)	120	8
Practical (1 course)	60	4
Field/Project work (1 course)	120	8

Paper 1. Fundamentals of Energy Systems

Unit 1: Physics of energy system – measurement of energy - laws of conservation of energy - various forms of energy - conversion – Bernoulli’s equation – heat transfer – conduction, convection and radiation – mass-energy equivalence.

Unit 2: Solar energy – introduction – solar constant – solar radiation at earth’s surface – solar radiation measurement - flat plate collectors - solar water heater - solar electric power generation – solar photo-voltaics.

Unit 3: Wind energy – introduction - major application of wind power – main components of a horizontal axis wind turbine - wind energy conversion system – environmental aspects – wind energy programme in India.

Unit 4: Nuclear power – introduction – binding energy and stability of nuclei – energy released in fission – chain reaction – thermal reactors - safety of nuclear power - the world scenario of nuclear power generation – Indian nuclear power generation projects.

Unit 5: Thermal power – heat versus temperature – first law of thermodynamics - efficiency of a thermal power plant – steam power plant – disadvantage of Carnot’s cycle for a steam power plant – fossil fuels and combustion – geothermal energy.

Reference books:

1. Haliday Resnick Fundamentals of Physics 8th edn, 2008– Jearl Walker, John Wiley & Sons.
2. Non conventional energy sources – G.D. Rai, Ed V. 1995.
3. Non conventional energy resources, B H Khan, Tata McGraw-Hill, New Delhi.
4. Energy Science principles, technologies and impact, John Andrews and Nick Jelly, Oxford University Press, 2007.

Paper 2. Energy resources, Economics and Environment

Unit 1: Renewable and non-renewable energy resources – fundamentals and definitions — energy planning - energy and sustainable development – scientific principles of renewable energy.

Unit 2: Energy and storage – importance – types – biological - chemical - heat storage – electrical storage – batteries and accumulators – lead acid battery (tubular and non-tubular) – superconducting electromagnetic storage – fuel cells – mechanical storage.

Unit 3: Transmission of electricity – 3 phase overhead AC transmission system – advantage of high voltage transmission - advantage of AC over DC transmission – comparison between overhead and underground cables.

Unit 4: Biomass energy – photosynthesis and crop yields – biomass potential and use – biomass energy production – environmental impact of biomass – economics and potential of biomass.

Unit 5: Economics of generation – definitions – connected load, maximum demand, demand factor, daily load curve, load factor, diversity factor – load duration curve – cost of electrical energy.

Reference Books:

1. Renewable Energy Resources, John Twidell & Tony Weir, 2nd edition, Taylor & Francis, London.
2. Electrical Power Systems, S. L.Uppal and S. Rao, Khanna Publishers, New Delhi.
3. Energy Science principles, technologies and impact, John Andrews and Nick Jelly, Oxford University Press, 2007.
4. Generation Distribution and Utilization of Electrical Energy, C.L.Wadhwa, New Age international (P) limited publishers, 2009.

Practical 1

1. Measurement of AC and DC current as well as voltage. Estimation of power and energy.
2. Measurement of heat energy required in raising the temperature of water using electrical heating methods.
3. Estimation of usable solar heat energy by solar heating of water in a darkened flat plate (vessel).
4. Estimation of electrical energy produced from vegetables, fruits etc.
5. Measurement of electrical energy obtained from solar PV cells.
6. Estimation of the efficiency of PV cell using artificial lighting.

Project/Field work

The objective of the course is to train the students so that a student gets the confidence to carryout independent work, group work and experience in handling various equipments related to power generation, conservation and transmission. A maximum of 5 students can combine together and do a project. Students are given the freedom of choosing the topic of the project; it may be theoretical or practical and may be from anyone of the following areas.

- a. Bio Fuels
- b. Wind Energy
- c. Solar Energy
- d. Nuclear Energy
- e. Storage and Transmission of energy.
- f. Theoretical modeling and simulation related to Energy Science.

Students are to submit the dissertation with a minimum of 25 pages. Students should be encouraged to lake it as a challenge and present their findings in conferences and exhibitions.

Model Question Papers

Time : Three hours

Maximum:75marks

PART A- (10x1=10 marks)

Answer all questions

Choose the correct answer

1. Fossil fuels refers to
a. Coal b. Oil c. Natural gas d. all the above
2. Solar radiation flux is expressed in
a. w/m b. J/m c. J/m² d. W/m²
3. The position of the sun directly over head is
a. Altitude b. zenith c. nadir d. radon
4. Ultraviolet rays absorbed by
a. CO₂ b. H₂O c. Ozone d. all the above
5. The power of a wind mill is proportional to
a. Velocity of wind b. square of velocity of wind c. cube of the velocity d. square root of velocity of wind
6. The order of power developed in a wind mill is
a. 15 mille watt b. 1 kilo watt c. 500 kilo watt d. 100 mega watt
7. The energy equivalent of the missing mass of a nucleus is called
a. Binding energy b. mass defect c. expected mass d. none
8. The most stable element in the universe is
a. Iron b. copper c. gold d. silver
9. The efficiency of a closed Carnot cycle operating between two heat reservoir T₁ and T₂ is
a. $\eta_c = 1 - T_2/T_1$ b. $\eta_c = 1 - T_1/T_2$ c. $\eta_c = T_1/T_2 - 1$ d. $\eta_c = T_2/T_1 - 1$
10. For steady state heat conduction, Fourier's law states that the heat flow is proportional to
a. Velocity gradient b. Energy gradient c. temperature gradient d. concentration gradient.

PART B – (5X5=25)

Answer all questions

11.(a) What are the different modes of heat transfer? Explain.

Or

(b) State and explain the laws of conservation of energy.

12.(a) Describe solar water heating by flat plate collectors.

Or

(b) Write short note on solar radiation at earth's surface.

13.(a) What is the principle used in wind mill?

Or

(b) Write a note on wind energy programmes in India.

14.(a) Discuss the energy released in a fission reaction.

Or

(b) Discuss the binding energy curve.

15. (a) What is geothermal energy? Why is it considered as renewable energy?

Or

(b) State and explain first law of thermodynamics.

PART C-(5X8=40)

Answer all questions

16. (a) State and explain the Bernoulli's equation for steady flow

Or

(b) What is mass energy equivalence? Obtain the relation connecting mass and energy.

What is the importance of the relation?

17. (a) Describe how solar radiation is measured using Pyrheliometer.

Or

(b).Discuss solar electric power generation using photovoltaic cells in detail.

18. (a) Describe the main components of horizontal axis wind turbine system.

Or

(b) Discuss the various environmental aspects of wind energy.

19. (a) Explain in detail about nuclear power reactor with a suitable diagram.

Or

(b) Discuss the various Indian nuclear power generation projects.

20. (a) Describe the closed cycle for a steam power plant and find a efficiency of the Carnot cycle.

Or

(b) Discuss the fossil fuels and combustion. Explain coal-fired combustion chamber.

APPENDIX - AZ14

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

CERTIFICATE COURSE IN COMPUTER SCIENCE

Under Career Oriented Programme

(FOR THOSE WHO JOINED THE COURSE FROM THE ACADEMIC YEAR
2012-2013)

Eligibility: UG I Year (Non Computer Science stream Only) Students

Medium of Instruction: English

Total No. Of Theory Papers: 3

Total No. Of Practical Papers: 2

Duration of Examination: 3 Hours

Question Pattern:

PART A (10 X 1 = 10 Marks) – Objective Type

PART B (5 X 6 = 30 Marks) – Either or Type

PART C (5 X 12 = 60 Marks) – Either or Type

SUBJECTS	TITLE OF THE PAPERS	NO. OF CREDITS	CONTACT HOURS	PASSING MIN. MARKS	MAX. MARKS
1.	Theory: Introduction To Computer	4	60	40	100
2.	Theory: Office Automation	4	60	40	100
3.	Theory: Desk Top Publishing	4	60	40	100
4.	Practical: Office Automation	4	60	40	100
5.	Practical: Desk Top Publishing	4	60	40	100
TOTAL		20	300		500

PAPER I

INTRODUCTION TO COMPUTER

Aim: The aim of this paper is to gain fundamental knowledge in computer

Objective

- To know the characteristic, parts and applications of computers
- To know the various devices and familiarize with their functions
- To know the usage of internet

Unit I

Introduction: What is computer? – Characteristics of Computers – Components of computers - History of computers – Generation of Computers – Advantages and Disadvantages of Computers – Areas of Application – Classification of computer system – Computer Architecture – Hardware – Software – IPO cycle

Number System: Decimal, Binary, Octal and Hexadecimal – Conversion

Computer Languages: Types of computer Languages – Translators – Types of Translators

Unit II

Logical Gates: AND, OR, NOT, NAND, NOR, XOR

Input Devices: Keyboard – Pointing Devices – Speech Recognition – Digital Camera – Scanners.

Output Devices: Classification of Output Devices – Monitors - Printers – Types of Printers– Plotters – Computer Output Microfilm (COM) – Headphones – Speakers – Projectors

Unit III

Memory: What is Memory? - Types of Memory – Volatile & Non-volatile memory

Storage Devices: Characteristics of Storage – Hierarchy of Storage Devices (Primary, Secondary, Tertiary and off-line) - Magnetic tape – Magnetic Disk - Optical Disk-Mass Storage devices.

Software: Types of Software – Software Development Steps

Unit IV

Operating System: Definition – Types – Various Functions – Examples

Computer Network: Definition – Uses – Client/Server Architecture – Classification of Network based on Geographical scope – Classification based on communication media – Classification based on organizational scope – Hardware components

Unit V

Internet: Definition – History and Development – Uses – What is Web? – How to access the Internet? – Services – Social Impact – Internet Technologies – Modem – Internet Addressing – Physical connection Telephone lines - Browsers - E-mail – Search Engine

Reference Books:

1. Introduction to Computer Science, ITL Solutions, 2nd Edition, Pearson Education
2. Introduction to Computers, Peter Norton, 7th Edition, Tata McGraw Hill Education
3. Computer Fundamentals, by Pradeep K.sinha , pritisinha ,3rd Edition BPB Publications.
4. Computer Fundamentals and Programming in C, Reema Thareja, Oxford University Press.

PAPER II

OFFICE AUTOMATION

Aim: The aim of this paper is to gain fundamental knowledge of Office automation package

Objective

- To understand the features of Windows operating system, Files & Folders
- To know the components, formatting, editing and other usages of MS-Word in daily life
- To know the method of doing calculation and application of financial and Statistical functions
- To make the students to present a product using power point
- To understand the concept of Database

Unit I

Windows: Introduction to Windows Operating System – Features – GUI – Desk Top – Task Bar – My Computer – Recycle bin – My Documents – Start Button – Creating Files or Folders – Windows Explorer – Search option – Opening and closing Application – Notepad – Paint – Installing Software

Unit II

MS Word: Introduction – Components – Features – Creating Document – Opening, saving and closing a document – Editing – Formatting – Bullets and Numbering – Inserting objects – Header and Footer – Links – Page Setup – Border and Shading – Paragraph setting – Inserting Breaks

Unit III

Working with Textbox – Working with Column – Working with symbol – Working with Equation – Working with Tables – Working with References – Working with Mail Merge – Spelling and Grammar – Track changes – Comments – Protecting Document – Macros – Printing the Document

Unit IV

MS Excel: Introduction to electronic spreadsheets – Excel basics – Creating and saving a work book – Entering data into the spreadsheet (Manual and automatic) – Basic formatting – Sorting – Filtering – Creating Chart - Header and Footer – Page Layout - Working with Formula and Functions – Conditional Formatting – Track changes – Sharing workbook – Comments – What if Analysis – Working with pivot table - Macros

Unit V

MS PowerPoint: Introduction – Creating a presentation – Inserting objects – Designing – Page Setup – Animation – Slide Show – Review – Different Views

MS Access: Introduction to Database – Creating database - Working with table – Working with Forms – Working with Query – Working with Report – Macros – Import and export option

Reference Books:

1. Sagman S, “MS Office for Windows XP”, Pearson Education
2. Stephen L.Nelson, Office 2000, Computer reference, Tata Mc Graw Hill
3. Perry G, “MS Office 2007”, Pearson Education, 2008
4. Fundamentals of computing C programming and MS office, Alexis Leon, Mathews Leon, Chitra, jeyaraj, Vijay Nicole Private Limited
5. Office 2007 Bible
6. The Complete Reference Microsoft Office Access 2007, By Virginia Anderson, TMH Publication.

PAPER III

DESK TOP PUBLISHING

Aim: The aim of this paper is to gain knowledge in the creation of printed materials

Objective

- To prepare students having skills to work in the field of content designing or desk top publishing where there is a great scope for them to work in printing Press, News Paper houses, Publishing companies and Advertising Industries

Unit I

Introduction: What is DTP? – Terminology – Applications – Merits and Demerits – Comparative Analysis between DTP and Traditional composing process

Adobe PageMaker: PageMaker Environment – Page Layout, Toolbox, Control palette - Creating a New Document - Setting the Margins - Setting the Page Size - Changing the Page Orientation - Setting the Page Numbers - Changing the Page size view - Using Rulers - Using Guides – Saving Files

Using Text: Entering Text – Importing text prepared in a word processor - setting Text properties: font, size, style, Colour, leading, spacing, kerning - Tracking and expert Tracking - Sub/Super Script - Flowing text from one text block to another - Editing text on the page and with the Story Editor - Checking Spelling - Applying Stroke and Fill

Unit II

Frames: Creating Frames and Blocks - Working with Paragraphs - Tabs and Indents - Paragraph Styles - Bullets and Numbers - Special Characters - Drop Caps - Inline Graphics

Graphics and Images: Fills and Outlines and Color - Working with Graphics - Manipulating with the Control Palette - Arranging Objects

Advanced Concepts: Working in Long Documents- Document Set-up, Setting up Master Pages, Adding Page Numbers, Advanced Numbering, Multiple Master Pages, Overriding Master Pages, Creating Layers to separate elements, Managing Links – Adobe Table – Printing – Story Editor – Overprinting and Trapping - PageMaker ClipArt and Images - Picture library - Templates - Data Merge

Unit III

Corel Draw: Basics and Interface - Exploring the CorelDraw Screen - The CorelDraw Menus - The Draw Toolbox - Using the Drawing Tools - Using the Zoom Tool - Using the Text Tool - Using Pick Tool - Using node editing (Shape) Tool - Using the Outline Tool - Using Fill tool

Objects Creation And Manipulation: Drawing and Shaping Objects - Selecting & Manipulating Objects - Transforming Objects - Outlining & Filling Objects - Arranging Objects - Using Layers - Arranging Objects - Layering

Working With Special Effects and Texts: Drawing With the Artistic Media Tool - Shaping an Object with an Envelope - Extruding an Object - Blending Two Objects - Using the Lens Effect - Adding Perspectives - Using Power Clips - Applying Contours - Applying Drop Shadows - Using Interactive Fills - Applying Distortions - Using Interactive Transparencies - Applying Mesh Fills

Working with Text: The Text Tool - Creating Artistic Text - Editing Text - Formatting Text - Setting Text Options - Creating Paragraph Text - Choosing Paragraph Options - Setting Indents Using the Ruler - Importing Text - Using the Spell Checker - Working With Paragraph - Special Text Effects - Using Symbols and Clipart - Working With Bitmaps

Unit IV

Corel Draw: Special Page Layouts - Creating a Greeting Card, Print Previewing the Layout, Creating Labels - Printing - Exporting Drawings - Using Styles and Templates - Custom Creation Tools - Using Corel Trace

Using Corel R.A.V.E.: About Corel RAVE - Playing sample RAVE animations - Performing the five steps necessary to create RAVE animations - Publishing to the web Create web rollovers - Inserting hyperlinks - Creating sprites and adding behaviors - Creating interactive movies

Unit V

Adobe Photoshop: About Photoshop - Navigating Photoshop - Menus and panels - Opening new files - Opening existing files - Exploring the Toolbox - Creating & Viewing a New Document - Customizing the Interface - Setting Preferences

Working with Images: Zooming & Panning an Image - Working with Multiple Images, Rulers, Guides & Grids - Undoing Steps with History - Adjusting Color with the New Adjustments Panel - The New Masks Panel & Vibrance Color Correction Command - The New Note Tool & the Save for Web & Devices

Interface - The New Auto-Blend & Auto-Align Layers Commands - The New 3D Commands - resizing & cropping images

Working with basic selections - Getting started with layers - Using Brush Tool - Working with Colors & Swatches - Creating & Using Gradients - Using the Pencil & Eraser Tools - The Red Eye Tool - The Clone Stamp Tool - The Patch Tool & the Healing Brush Tool - The Spot Healing Brush Tool - The Color Replacement Tool - The Toning & Focus Tools

Quick mask options - working with the pen tool - Creating special effects - Exporting your work - Saving with Different File Formats - Saving for Web & Devices - Printing Options

Reference Books:

1. Desktop Publishing by Computer world
2. Rapidex Dtp Course, Shirish Chavan
3. The Complete Reference – Page Maker
4. CorelDraw IN Simple Steps – Shalini Gupta
5. CorelDRAW Bible - DEBORAH MILLER
6. TEACH YOURSELF ADOBE PHOTOSHOP – Rose Carla

PRACTICAL I

OFFICE AUTOMATION

MS-WORD

1. Creating and Saving a Document
2. Resume Preparation
3. Letter Pad Preparation
4. Creating an Invitation
5. Creating News Paper Format
6. Designing a Cover page
7. Formatting Text with Bullets, Numbering and Header & Footer
8. Mail Merge Creating
9. Creating Student Mark Statement
10. Macro Creation

MS- EXCEL

1. Student Mark sheet
2. Pay bill Preparation
3. Working with Formula
4. Creating Chart
5. Working with Pivot Table

MS-Power Point

1. Creating a Presentation for your college
2. Creating a Presentation for a company

MS-Access

1. Student Database Creation
2. Employee Data base Creation
3. Customer Detail using Query

PRACTICAL II

DESK TOP PUBLISHING

PAGE MAKER

1. Letter Head Preparation
2. Creating an Invitation
3. Creating News Paper Format
4. Designing a Cover page
5. Visiting Card Designing
6. Hand Bill Preparation
7. Application Form Design
8. Booklet Preparation

COREL DRAW

1. Logo Creation
2. Creating a Greeting
3. Designing an Advertisement
4. Designing a Cover page

PHOTOSHOP

1. Poster Design
2. Invitation Design
3. Book Cover Preparation
4. Web page Design
5. Changing Background
6. Merging Two images
7. Morphing
8. Photo Editing

Code No.: _____

Sub. Code: _____

**CERTIFICATE COURSE IN COMPUTER SCIENCE
APRIL 2013**

Non-Semester

Time: 3 Hours

Max. Marks: 100

PART A (10 X 1 = 10 Marks)

Answer all the Questions

1. What is computer?
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

PART B (5 X 6 = 30 Marks)

Answer all the Questions

11. (a)
(b) (Or)
12. (a)
(b) (Or)
13. (a)
(b) (Or)
14. (a)
(Or)

- (b)
15. (a)
(b)

(Or)

PART C (5 X 12 = 60 Marks)
Answer all the Questions

16. (a)
(b)

(Or)

17. (a)
(b)

(Or)

18. (a)
(b)

(Or)

19. (a)
(b)

(Or)

20. (a)
(b)

(Or)

APPENDIX – AZ15

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12
UGC-CAREER ORIENTED PROGRAMME
CERTIFICATE COURSE IN **Medicinal Plants**

(FOR THOSE WHO JOINED THE COURSE FROM THE ACADEMIC YEAR 2012-2013)

Certificate course in MEDICINAL PLANTS

Basic Qualification:

Pass in +2 Examinations or any other equivalent course.

Eligibility:

The faculty members handling UG courses in Botany may be allowed to handle the papers for certificate / Diploma & Advanced Diploma courses in Medicinal plants.

Scheme of Examination

THEORY:

Paper I Total: 100 Marks 3 hrs

Paper II Total: 100 Marks 3 hrs

PRACTICAL

Paper I Total: 100 Marks 3 hrs

Passing Minimum: 40 Marks

Question Paper pattern:- Duration 3 hours.

Part A 10× 2 = 20 marks

Part B 5× 6 = 30 marks

Part C 5×10 = 50 marks

Part A = 2 marks short notes.

Part B & Part C = Explanation Questions.

CERTIFICATE COURSE IN MEDICINAL PLANTS

S.No	Title of the Paper	No. of credits	Contact Hours	Minimum marks	Maximum marks
1	Medicinal plants & Pharmacognosy	7	105	40	100
2	Cultivation and Utilization of Medicinal plants	7	105	40	100
3	Practical - 1	6	90	40	100
	Total	20	300		

PAPER –I MEDICINAL PLANTS AND PHARMACOGNOSY

UNIT I

Introduction to medicinal plants – Flowering and Non flowering, Scope and Historical account, Classification of medicinal plants on the basis of morphological structures –Root, Rhizome, Bark, Wood, Leaves, Flowers, Fruits, Seeds and whole plants.

UNIT II

Outline of Indian systems of medicine- Alternative system of medicine: - Siddha, Ayurveda and Homoeopathy – Plants in Siddha, Ayurveda and Homoeopathy.

UNIT III

Critical study of the following flowering plants – Botanical and Vernacular names, useful parts and uses. **Zingiber, Ocimum, Azadirachta, Acalypha, Murraya** and **Carica papaya**.

UNIT IV

Medicinal uses of some non flowering plants

Algae:- Agar-Agar, **Spirulina** – mass cultivation and Therapeutic properties.

Fungi:-Antibiotics- Streptomycin, Penicillin, Industrial production of Penicillin.

Mushrooms: – Edible mushrooms, Nutritional value and Medicinal value of Mushrooms.

Lichens: *Parmelia, Usnea*.

UNIT V

Pharmacognosy: Definition, commercial drugs – Preparation, Crude drugs, Classification of drugs – morphological, Pharmacological and Chemical. Drug evaluation – Macroscopic, Microscopic, Chemical and Physical.

REFERENCES

1. John Jothi Prakash, E. 2004. Medicinal and Aromatic Plants. JPR Publications, Zion Manai, North Street, Neyyoor - 629802.
2. John Jothi Prakash, E. 2004. Medicinal Botany and Pharmacognosy, JPR Publications, Zion Manai, North Street, Neyyoor - 629802.
3. Kumar, N.C. 2004. An Introduction to Medicinal Botany and Pharmacognosy. Emkay Publications, Delhi.
4. Purohit, S.S. 2008. Medicinal Plants Cultivation: a Scientific approach, Agrobios, Jothpur 342002.
5. Trivedi, P.C. 2008. Medicinal Plants: Ethnobotanical Approach. Agrobios, Jothpur 342002.
6. Medicinal plants of India, ICMR New Delhi 1976.

PAPER II- CULTIVATION & UTILIZATION OF MEDICINAL PLANTS

UNIT I

Cultivation and storage of following medicinal plants. Vettiver, Rose, Chirukattalai, Nithya kalyani.

UNIT II

Collection of Medicinal plants- Stage of Harvest, Harvesting personnel, Method of harvesting, Post harvest processing. Drying: Types- Natural and Artificial, Garbling, other post harvest processing.

UNIT III

Extraction of essential oils-Distillation. Types of distillation-Water distillation, Water steam distillation and Steam distillation. Machinery for steam distillation. Extraction of Eucalyptus oil and Clove oil.

UNIT IV

Remedial Plants: - Anti Cancer drugs and therapy. Herbal drugs used in the treatment of Heart and Respiratory diseases. Psychoactive plants.

UNIT V

Trading and conservation of medicinal plants:- Domestic trade, Local marketing, Conservation methods, Biotechnology in the conservation of Medicinal plants. Medicinal plants in the Home garden, Herbal farms in the Hills and Plains. Adulterants- Types of adulterants.

PRACTICALS – PAPER I

1. Identification of the medicinal plants included in the syllabus.
2. Organoleptic study of the medicinal plants mentioned in the syllabus.
3. A survey report of medicinal plants in the campus/village.
4. Models of water, steam distillation.
5. Identification of common adulterants of medicinal plants.
6. Visit to herbal gardens and industries preparing herbal medicines.

REFERENCES

1. John Jothi Prakash,E. 2004. Medicinal and Aromatic Plants.JPR Publications, Zion Manai, North Street, Neyyoor – 629 802.
2. John Jothi Prakash,E. 2004. Medicinal Botany and Pharmacognosy, JPR Publications, Zion Manai, North Street, Neyyoor – 629 802.
3. Kumar,N.C.2004. An Introduction to Medicinal Botany and Pharmacognosy. Emkay Publications, Delhi.
4. Purohit,S.S.2008. Medicinal Plants Cultivation: a Scientific approach, Agrobios, Jothpur 342002.
5. Trivedi,P.C.2008. Medicinal Plants:Ethnobotanical Approach.Agrobios, Jothpur 342002.
6. Medicinal plants of India,ICMR New Delhi 1976.

Model Question Paper
CERTIFICATE COURSE IN MEDICINAL PLANTS
EXAMINATIONS, APRIL 2013
Non – Semester

Time: Three hours

Maximum: 100 marks

SECTION A – (10 × 2 = 20 marks)

Answer all the questions

1. Define Doctrine of Signatures.
2. What is Rhizome?
3. Mother tincture.
4. Alternative system of medicine.
5. What are the uses of Azadirachta?
6. Write the Botanical name and uses of Carica papaya.
7. Agar-Agar.
8. Edible mushrooms.
9. Crude drugs.
10. Drug evaluation.

SECTION B – (5 × 6 = 30 marks)

Answer any FIVE questions

11. Add a note on the Scope and importance of medicinal plants.
12. Write a brief note on the origin of Siddha system of medicine.
13. Write any five plants used in Ayurveda system of medicine.
14. Write about the medicinal uses of Zinger. Name the family to which this plant belongs and the morphology of the useful plant.
15. Write the Botanical name, Morphology of the useful part and medicinal importance of Acalypha indica.
16. Write the therapeutic properties of Spirulina.
17. Write about the Nutritional and medicinal value of Mushrooms.
18. Write notes on Classification of Drugs based on morphology.

SECTION C – (5 × 10 = 50 marks)

Answer any FIVE questions

19. Classify the medicinal plants.
20. What are traditional systems of medicine? Write an essay on the origin of any two such systems of medicine.
21. Write the family, botanical name, morphology of useful part and medicinal uses of any five medicinal plants.
22. Write an essay on the mass cultivation of Spirulina.
23. Give an account of Industrial production of Penicillin.
24. Write an essay on medicinal uses of any five non flowering plants.
25. Give an account of preparation of Commercial drugs.
26. Write an essay about Drug evaluation.

APPENDIX - AZ16

MANONMANIAM SUNDARANAR UNIVERSITY Tirunelveli – 12

CERTIFICATE COURSE IN FINANCIAL MANAGEMENT

UNDER CAREER ORIENTED PROGRAMME

(For those who joined the Course from the Academic year 2012-2013)

1. Course: Certificate Course in Financial Management
2. Medium of Instruction and Examinations: English
3. Eligibility for Admission: I Year Under Graduate Students
4. Course Structure

Sl. No	Sub. Code	Name of the Paper	Credits	Contact Hours	Marks	
					Min.	Max.
1		Financial Management	6	90	40	100
2		Financial Services	6	90	40	100
3		Project	8	120	40	100
		Total	20	300		

5. Examination

Pattern of Question Paper (Maximum 100 Marks, 3 Hours)

Part A – Ten Multiple Choice Questions(10 X 1 = 10 marks)

Part B – Five Internal Choice Questions (5 X 6 = 30 marks)

Part C – Five Internal Choice Questions (5 X 12 = 60 marks)

6. Project Work

Group project with maximum 5 students will be evaluated based on the report submitted at the end of the certificate course.

Marks: Viva-Voce Examination - 40
Project Report - 60

SYLLABUS FOR CERTIFICATE COURSE IN FINANCIAL MANAGEMENT PAPER I – FINANCIAL MANAGEMENT

UNIT I

18 hours

Financial Management: Meaning, nature and scope of finance, Financial goal profit Vs. wealth maximization; Finance function – investment, financing and dividend decisions.

UNIT II

18 hours

Capital Budgeting: Nature of investment decisions; Investment evaluation criteria – net present value, internal rate return, profitability index, payback period, accounting rate of return; NPV and IRR comparison; Capital rationing,

UNIT III

18 hours

Cost of Capital: Meaning and significance of cost of capital; Calculation of cost of debt, preference capital, equity capital and retained earnings; Combined cost of capital (weighted), Cost of equity and CAPM.

UNIT IV

18 hours

Operating and Financing Leverage: Measurement of leverage; Effects of operating and financial leverage on profit; Analyzing alternate financial plans;

UNIT V

18 hours

Capital Structure Theories: Traditional and M.M. Hypotheses – without taxes and with taxes; Determining capital structure in practice.

References

1. Bhattacharya, Hrishikas: Working Capital Management: Strategies and Techniques, Prentice Hall, New Delhi.
2. Brealey, Richard A and Steward C. Myers: Corporate Finance, McGraw Hill, International.
3. Chandra, Prasanna: Financial management, Tata McGraw Hill, Delhi;
4. Hampton, John: Financial Decision Making, Prentice Hall, Delhi.
5. Pandey, I.M: Financial Management, Vikas Publishing House, Delhi
6. Van Home, James C: Financial Management and Policy, Prentice Hall, Delhi.

SYLLABUS FOR CERTIFICATE COURSE IN FINANCIAL MANAGEMENT PAPER II – FINANCIAL SERVICES

UNIT I

18 hours

Financial Services – Concept, objectives / Functions, characteristics. Financial Services Market – concept constituents – Problems of Financial Services Sector. Growth of Financial Services in India NBFC – Functions, strength and weakness.

UNIT II

18 hours

Commercial banking and their fund based and Non fund based financial services, Leasing, Hire purchases financing salient features, guidelines – functions.

UNIT III

18 hours

Mutual funds – Types of Mutual Funds, Floatation, Asset Management company mutual funds – Regulations.

UNIT IV

18 hours

Factoring – Forfeiting, Securitisation, Venture Capital, Consumer finance and credit cards, Salient features – guidelines – functions, strategies Involved in financing.

UNIT V

18 hours

Merchant banking – underwriting – Port folio management. Stock and Security broking – credit rating services. Salient features – guidelines – functions.

References

1. Avadhani, V.A. Investment Management, Himalaya Publishing House, Delhi.
2. Varma – Merchant Banking
3. Khan M.Y. Indian Financial system – Theory and Practice, Vikas Publishing Hose.
4. Gurusamy – Financial Services and System, Vijay Nicole Imprints Pvt.Ltd, Chennai.
5. Gordon and Natarajan – Financial Markets and Services, Himalaya Publishing House.
6. FranciesCherunilam – Financial Services
7. Vasanth Desai – Financial Services

APPENDIX - AZ17

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

CERTIFICATE COURSE IN INDIAN CULTURE **Under Career Oriented Programme**

**(FOR THOSE WHO JOINED THE COURSE FROM THE
ACADEMIC YEAR 2012-2013)**

Eligibility: UG I Year Students

Medium of Instruction: English & Tamil

Total No. Of Theory Papers: 2

Duration of Examination: 3 Hours

Question Pattern:

PART A (10 X 1 = 10 Marks) – Choose the Correct Answer

PART B (5 X 6 = 30 Marks) – Either or Type

PART C (5 X 12 = 60 Marks) – Either or Type

SUBJECTS	TITLE OF THE PAPERS	NO. OF CREDITS	CONTACT HOURS	PASSING MIN. MARKS	MAX. MARKS
1.	Theory: Introduction to Indian Culture	6	90	40	100
2.	Theory: Impact of Geography on Indian Culture	6	90	40	100
3.	Project	8	120	40	100
TOTAL		20	300		300

PAPER I

Introduction to Indian Culture

Unit I

Culture - Meaning – definitions - scope and importance – civilization – Meaning – Definition – Various Civilizations of the world – Roman – Greek – Babylonian – Assyrian – Sumerian – The Chinese – Egyptian.

Unit II

Indian culture – Characteristic features – Pre-Historic period: Paleolithic, Mesolithic, Neolithic, Chalcolithic – Indus Culture – Vedic Culture – Compare the Indus and Vedic Culture.

Unit III

Impact of Buddhism and Jainism on Indian culture – Life of Buddha Preachings of Buddha – Buddhist sects - Buddhist councils – Life of Mahavira - Teachings of Mahavira - spread of Jainism and Buddhism - its impact on Indian culture

Unit IV

Alien influence on Indian culture – Influence on Islam on Indian Culture – Delhi Sultanate – Mughals – Art, Architecture, Sculpture, Paintings and Literature – Westernization of Indian culture- Portuguese – Dutch- French and English

Unit V

Contemporary Indian Culture – India an Ethnological museum – unity in Diversity –North Vs south – culture of Tamils.

Reference

1. A. L. Basham – The Wonder That was India
2. Prof. Rizziwi – The Wonder That was India – Part – II
3. A. L. Basham (Ed) – The Cultural History of India
4. B. N. Lunia – Life and culture of Ancient India
5. B. N. Lunia – Evaluation of Indian Culture

PAPER II

Impact of Geography on Indian Culture

UNIT I

Indian Geography – Meaning – Characteristic – Features – boundaries – Nature of Indian Geography – Climate – Rainfall – Monsoons – Flora- Fauna – National Parks – Wild life sanctuaries – Birds sanctuaries

Unit II

India – Subcontinent – Himalayas – Upper Himalayas – Lower Himalayas – Sulaiman and Kirthar Mountains – Eastern hills- Kashmir valley – Passes – Peaks – Hill resorts – Himalayas and Adventure Tourism Nature of Indian Geography

UNIT III

Indo Gangetic valley – River Indus and its tributaries – River Ganges and its tributaries – Thar desert and its impact – Food production – Irrigation projects – Hydro Electric power stations – Inland waterways

UNIT IV

Deccan plateau – Land locked between Western Ghats and Eastern Ghats – Vindhya and Satpura Mountain – Important rivers – Narmada – Tapti, Mahanadi, Godavari, Krishna, Vennar, Palar, Cauvery, Vaigai and Tamiraparani – Hydro electric power stations and Irrigative facilities.

UNIT V

Coastal regions and their influence – Coramandel coast, Konkan coasts – Malayam coast – Indian ocean – Bay of Bengal- Arabian sea – Beach resorts – Hill resorts – Spas – Deforestation and Afforestation –Natural Harbors – Impact of Geography on Indian tourism.

Reference

1. George Kuriyan – India General Surrey – New Delhi
2. R. C. Majumdar – The Vedic Age
3. R. C. Majumdar – World Geographic Encyclopedia
4. R. C. Majumdar – A Comprehensive History of India – Vol – I
5. R. C. Majumdar – Ancient India – New Delhi

APPENDIX - AZ18

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

Syllabus for the Certificate Courses in

“Economics and Statistics”

(Non-Economics Students)

under UGC sponsored Career Oriented Programmes

**(FOR THOSE WHO JOINED THE COURSE FROM THE
ACADEMIC YEAR 2012-2013)**

Eligibility

Certificate Course : Any first year degree student

Qualification Norms to handle the Course

Post Graduate Degree in Economics is eligible to handle classes. Preference may be given to those who have handled the classes.

Certificate Course in “Economics and Statistics”

Sub Code	Name of the Paper	No. of Credits	Contact Hours	Min. Marks	Max. Marks
Theory Papers					
ES1	Principles of Economics	6	90	35	100
ES2	Statistical Methods	6	90	35	100
Project Work					
EDP1	Group Project(5 Candidates for each project)	8	120	35	100
Total		20	300		

Syllabus for the Certificate Course in
“Economics and Statistics ”
(Non-Economics Students)

PRINCIPLES OF ECONOMICS

Objective

To enable the students to understand the basic concepts of Economics, different Laws of Economics, Factors of production, market structure and pricing and theories of distribution.

UNIT – I INTRODUCTION

Introduction - Definitions of Economics – Main Divisions of Economics- Economic Laws – Basic concepts.

UNIT – II CONSUMPTION

Human wants – Characteristics and classification of human wants – Law of Diminishing Marginal Utility – Law of Equi - Marginal Utility – Consumer’s Surplus – Law of Demand – Elasticity of Demand.

UNIT – III PRODUCTION

Meaning – Factors of Production – Characteristics of different factors – Theories of Population – Capital formation – Functions of an entrepreneur – Large-Scale and Small Scale Production.

UNIT – IV EXCHANGE

Cost and Revenue concepts and curves – Perfect Competition and price determination – Monopoly and price determination – Monopolistic Competition and price determination – Time element.

UNIT – V DISTRIBUTION

National Income - Rent – Theories of Rent – Wages – Theories of Wages – Interest – Theories of interest – Profit – Theories of Profit.

References:

1. Advanced Economic Theory – M. L. Jhingan
2. Micro Economics – K. Pazhani

STATISTICAL METHODS

Objective

To enable the students to understand the use of statistical tools in projects / research.

UNIT – I CONCEPTS

Meaning of Statistics – Characteristics of Statistics – Data collection – Primary Data – Secondary Data – Sampling methods – Classification – Tabulation – Diagrammatic presentation of data.

UNIT – II AVERAGES

Meaning - Mean – Median - Mode – Geometric Mean – Harmonic Mean.

UNIT – III DISPERSION

Meaning – Measures of Dispersion – Range – Quartile Deviation – Mean Deviation – Standard Deviation – Coefficient of Variation – Lorenz Curve.

UNIT – IV CORRELATION AND REGRESSION

Correlation – Meaning – Types – Methods of studying correlation – Regression – Meaning – Regression lines.

UNIT – V TIME SERIES

Meaning – Components of Time Series – Concepts-Methods of studying Trend – Uses of Time Series.

References:

1. Statistical Methods – S. P. Gupta
2. Basic Statistics – Nagar, A.L. and R.K.Das
3. Statistics - K. Pazhani

APPENDIX – AZ19

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12

CERTIFICATE COURSE IN INDUSTRIAL ANALYTICAL CHEMISTRY

UGC-CAREER ORIENTED PROGRAMME

(FOR THOSE WHO JOINED THE COURSE FROM THE ACADEMIC YEAR 2012-2013)

Paper No.	Title of the Paper	No. of credits	Contact hrs/ year	Minimum marks	Maximum marks	Exam . Hrs.
1	Industrial chemistry	7	105	40	100	3
2	Analytical chemistry and instrumentation	7	105	40	100	3
3	Practical	6	90	40	100	3
	Total	20	300		300	

Basic Qualification:

Pass in +2 Examinations or any other equivalent course

Eligibility:

The faculty members handling UG courses in Chemistry may be allowed to handle the papers for certificate/Diploma/Advanced Diploma course

Evaluation:

Both Theory and Practical papers have only external assessment. There is no internal assessment marks.

This course is one year duration under non-semester pattern

Question Paper pattern:Theory

Part A: 10 Questions (10 x 2 = 20 marks)

Short notes – two questions from each unit

Part B: 5 Questions (5 x 6 = 30 marks)

Either or choice – one question from each unit

Part C: 5 Questions (5 x 10 = 50 marks)

Either or choice – one question from each unit

Practical

Part A: 70 marks – Estimation/Determination

Part B: 30 marks – Preparation

Minimum marks for pass:

A candidate shall be declared to have passed in a theory/practical if he/she obtains a minimum of 40% in the external examinations.

Paper 1: INDUSTRIAL CHEMISTRY

Hours/Year:90

Credits: 7

Objectives:

To know the basic ideas on fuels, corrosion, fertilizers, petroleum products and plastics.

UNIT-I FUELS AND FURNACES

Fuels- types of fuels- calorific value-ignition point-pyrometric effect-explosive range –Furnaces- types of furnaces - Kilns-Blast furnace-Reverberatory furnace- Muffle furnace-electric furnace-regenerative furnace-open hearth furnace-Bessemer converter

UNIT-II CORROSION AND PROTECTIVE COATING

Introduction- severity of corrosion- types of corrosion- chemical and electrochemical corrosion – mechanism- factors influencing corrosion- control of corrosion-cathodic and anodic protection.

Metallic coating-removal of surface contamination- removal of superficial corrosion products – polishing – galvanizing – tinning-electroplating

UNIT-III FERTILIZERS

Definition - classification of fertilizers-Nitrogenous fertilizers: manufacture of ammonium nitrate- ammonium sulphate- calcium cyanamide- calcium ammonium nitrate- Urea - Phosphate fertilizers: Phosphate rock – manufacture of superphosphate of lime - triple super phosphate-Ammonium phosphate - Potash fertilizers: manufacture of potassium chloride- potassium nitrate-NPK fertilizers.

UNIT IV PETROLEUM

Petroleum refining- products of distillation of petroleum- uses of petroleum products- fuel hydrocarbons and lubricants - processes for the production of petro chemical precursors- ethylene, propylene, butadiene, acetylene, benzene, toluene and xylene- petro chemical industries in India.

UNIT-V PLASTICS AND SYNTHETIC FIBERS

Thermo and thermo setting plastics – Manufacture:polyethylene- poly styrene- phenol formaldehyde resins – Bakelite- Distinction between natural fibers and synthetic fibers- artificial silk- manufacture of rayon byViscose process, Cellulose acetate process, Cuprammonium process- manufacture of Nylon-66, Terylene- uses of synthetic fibers.

Books for references:

1. Industrial Chemistry, B.K. Sharma, Goel Publishing House, Meerut.
2. Industrial Chemistry, B.N.Chakrabarty, Oxford & IBH Publishing Co.Pvt.Ltd., Calcutta.
3. Industrial Chemistry, Ayodhya Singh, Campus Books, International I Edition, New Delhi.
4. Reigels Hand Book Industrial chemistry, a/e, Revised by Kent CBS Publishers & Distributers, New Delhi.
5. Applied Chemistry, M.Karunanithy, N.Ayyaswami, T.Ramachandran, H.Venkatramanan, Anuradha Agencies, Educational Publishers, Kumbakonam- Reprint 1998.

Paper 2: ANALYTICAL CHEMISTRY AND INSTRUMENTATION**Hours/Year:90****Credit: 7****Objective:**

To know the importance of analytical chemistry and instrumentation.

UNIT-I INTRODUCTION TO ANALYTICAL CHEMISTRY

Handling of chemicals: corrosive, inflammable, explosive, and poisonous - Waste and fume disposal- simple first aid for accidents involving acids, alkalis, bromine burns and cuts by glass -handling of glasswares- pipettes, standard measuring flask- calibration.

Chemical error analysis: accuracy, precision, absolute error, relative error, types of errors, method, minimizing the error -methods of expressing precision- mean, media, mean deviation.

UNIT-II TITRIMETRIC METHODS OF ANALYSIS

Requirements for titrimetric analysis- concentration terms – molarity- normality - criteria for primary standard- preparation of standard solutions - buffer solution- pH and its determination- Henderson equation - preparation of acidic and basic buffers- relative strength of acid and bases from K_a and K_b values – neutralization-titration curves-theory of indicators-choice of indicators –complexometric titrations-titrations involving EDTA- metal ion indicators.

UNIT-III THERMOMETRIC METHODS

Thermo analytical method -principle of thermogravimetry,differential thermo analysis -characteristics of TGA and DTA curves - factors affecting TGA and DTA curves - applications - TGA of calcium oxalate monohydrate - DTA of calcium oxalate monohydrate.

UNIT-IV X-RAY AND LASER

Production of X-rays - experimental methods - Crystal structures of NaCl,CsCl- Laser - production of Laser -principle - types of Laser -application of Laser -principle of super capacitor.

UNIT-V SPECTRAL ANALYSIS

Colorimetry and spectrophotometry - Beer-Lamberts law - principles of colorimetric analysis - applications - UV spectroscopy : types of electronic transition -applications - NMR spectroscopy : principle - chemical shift - factors influencing chemical shift - NMR spectrum of simple organic molecules - ethyl alcohol , ethyl bromide - ESR spectrum of deuterium - applications of ESR.

Books for Reference :

1. Elements of analytical chemistry - R.Gopalan, P.S. Subramanian, K.Rangarajan, S.Chand and sons, New Delhi.
2. Vogel's Textbook of Quantitative Chemical Analysis, 6th Edition.
3. Analytical Chemistry: Theory and Practice, R.M Varma, CBS Publishers and distributors, New Delhi-4.
4. Separation methods, M.N. Shastri, 2nd Revised Edition 1996, Himalaya Publishing House, Mumbai.

PAPER3: PRACTICAL

Hours/Year : 90

Credit: 6

Estimation / Determination

1. Estimation of water of hydration in hydrated salts
2. Estimation of Iodine value of oil
3. Estimation of saponification of oil
4. Estimation of fluoride in water
5. Estimation of hardness of water
6. Determination of alkalinity of water sample
7. Conductometric titration – NaOH vs HCl
8. Potentiometric titration – KMnO_4 vs FAS
9. Equivalent conductance of strong electrolytes
10. Determination of pH of a Buffer
11. pH Titration – Strong acid-strong base
12. Determination of boiling point and melting point
13. Transition temperature

Out of 13 experiments 9 should be recorded

Preparation of Industrial products

1. Boot polish – Black and Brown
2. Preparation of gel ink
3. Detergent
4. Liquid Soap (Shampo)
5. Talcum Powder
6. Aspirin
7. Preparation of succinic acid from maleic acid
8. Separation of MgCl_2 from sea water

Out of 8 preparations 5 should be recorded

Model Question Paper

Certificate Course in Industrial Analytical Chemistry Examinations, April 2013

Time : 3 Hrs

Max : 100 marks

Section-A(10 x 2 = 20 Marks)

Answer ALL the questions

1. Define: Calorific value.
2. What is the use of Muffle furnace?
3. Mention the types of corrosion.
4. Define: Tinning.
5. What is NPK fertilizer? Give an example.
6. How is potassium nitrate prepared?
7. What is petroleum refining?
8. Give two examples for lubricants.
9. Give the preparation of polyethylene.
10. What are the uses of synthetic fibers?

Section-B (5 x 6 = 30 marks)

Answer ALL the questions

11. a) What are fuels? Explain their types with suitable example.
(OR)
b) Discuss Bessemerconverter.
12. a) Explain the types of corrosion with an illustration.
(OR)
b) Discuss various types of metal coatings and their advantages.
13. a) How are fertilizers classified? Give examples.
(OR)
b) Write short notes on potash fertilizers.
14. a) Mention the various fractions of petroleum distillation. Give their uses.
(OR)
b) How are the following prepared?
i) Butadiene ii) Toluene
15. a) What are thermo and thermosetting plastics? Give their differences.
(OR)
b) Write the manufacture of Nylon-66 and Terylene.

Section-C (5 x 10 = 50 marks)

Answer ALL the questions

16. a) Explain two types of furnaces and their applications.
(OR)
- b) Explain
i) ignition point ii) pyrometric effect iii) explosive range
17. a) What are the factors influencing corrosion? How are corrosion controlled?
(OR)
- b) Write short on
i) Electroplating ii) Galvanisation
18. a) i) How is urea manufactured?
ii) What is triple super phosphate? How is it prepared?
(OR)
- b) How are the following prepared ?
i) ammonium nitrate ii) calcium cyanamide
19. a) Write short notes on petrochemical industries in India.
(OR)
- b) Give the preparation and uses of the following
i) benzene ii) acetylene iii) xylene
20. a) How is Rayon manufactured by
i) Viscose process ii) Cellulose acetate process
(OR)
- b) How is bakelite and phenol formaldehyde resins prepared? Give their uses.

APPENDIX - AZ20

MANONMANIAM SUNDARNAR UNIVERSITY, TIRUNELVELI – 627012

Syllabus for the
Certificate Course in Accounting
Under UGC sponsored Career Oriented Programme
(FOR THOSE WHO JOINED THE COURSE FROM THE ACADEMIC
YEAR 2012-2013)

Eligibility: Any first level degree with +2 level i) Science group ii) non-commerce students

One Year Certificate Course in Accounting

S. No	Title of the Paper	No. of Credit	Contact Hours	Min. Marks	Total
1	Principles of Accounting	6	90	40	100
2	Accounting Package – Tally	6	90	40	100
3	Practical/Training	8	120	40	100
	Total	20	300		

A candidate shall be declared to have passed in theory paper/Practical/Project if he/she obtains a minimum of 40% mark in the External Examinations. This course is one year duration for Under Graduate Non-Commerce students.

Question Paper Pattern:

- Part A : 10 x 1 = 10 marks (objective type)
Part B : 5 x 6 = 30 marks (internal choice)
Part C : 5 x 12 = 60 marks (internal choice)

Duration : 3 hours

PAPER I - PRINCIPLES OF ACCOUNTING

Unit I

Definition of Accounting – Accounting Concepts and conventions – Journal – Ledger – Trial Balance

Unit II

Subsidiary books – Purchases Book – Purchase returns book – Sales Book – Sales Returns book – Cash Book (with simple problems).

Unit III

Final Accounts – Trading and Profit and Loss Account – Balance Sheet with simple adjustments

Unit IV

Bank Reconciliation Statement (Simple Problems)

Unit V

Rectification of errors and Average due date

Reference Books:

1. R.L. Gupta and M. Radhaswamy, Advance Accountancy, Sultan chand & sons, New Delhi
2. S.N Maheswari, Introduction to Accounting, Vikas Publishing House, New Delhi
3. M.A Arulanandam and K.S. Raman – Advance Accountancy

Note: The questions should be asked in the ratio of 60% for problems and 40% for theory.

PAPER – II

ACCOUNTING PACKAGE – TALLY - I

UNIT- I

Basics of Accounting- Tally – Features of Tally – Tally screen components – creating/setting up of company in Tally – Company Features – Creating Accounting Features –Creating Accounting Ledgers.

UNIT – II

Accounting Features – Inventory Features – Statutory and Taxation - Configuration in Tally.

UNIT – III

Creating Inventory Ledgers – Types of Vouchers – Create Stock Items , Stock Groups, Stock Categories, Godowns and Units of Measure – Bill of Material.

UNIT – IV

Create Cost Categories, Cost Centers – Invoice - Interest Calculations – Multiple Currencies Creation.

UNIT – V

Budgets – POS – Display and Reporting – Trial Balance – Final Accounts – Cash flow and Fund Flow –Multi Account Printing.

Reference Books:

1. Tally courseware
2. Financial Accounting using tally 6.3
3. Tally user manual tally solutions (p) Limited
4. Tally – Nadni
5. Tally – Namrata Agrawal

LIST OF PRACTICALS FOR CERTIFICATE COURSE

1. Accounting Ledger Creation
2. Accounting Voucher Creation
3. Inventory Ledger Creation
4. Inventory Voucher Creation
5. Cost Categories and Cost Centers
6. Interest Calculations Creation
7. Multi Currencies Creation
8. Budgets Creation
9. Ledger Creation of POS
10. Final Accounts and Its Adjustments
11. Trial Balance , Fund Flow and Cash Flow

MODEL QUESTION PAPER

Code No:

Sub. Code:

CERTIFICATE COURSE IN ACCOUNTING
APRIL 2014 - Non-Semester

Time : 3 Hours

Max. Marks : 100

PART A (10X1 = 10 Marks)

Answer all the Questions

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

PART B (5 X 6 = 30 Marks)

Answer all the Questions

- | | | |
|-----|-----|------|
| 11. | (a) | |
| | (b) | (Or) |
| 12. | (a) | |
| | (b) | (Or) |
| 13. | (a) | |
| | (b) | (or) |
| 14. | (a) | |
| | (b) | (or) |
| 15. | (a) | |
| | (b) | (or) |

PART C (5X12 = 60 Marks)

Answer all the Questions

16. (a) (Or)
(b)
17. (a) (Or)
(b)
18. (a) (or)
(b)
19. (a) (or)
(b)
20. (a) (or)
(b)

APPENDIX - AZ21

MANONMANIAM SUNDARNAR UNIVERSITY, TIRUNELVEIL –12

CERTIFICATE COURSE IN RETAILING (Commerce)

UNDER CAREER ORIENTED PROGRAMME

**(FOR THOSE WHO JOINED THE COURSE FROM THE
ACADEMIC YEAR 2012-2013)**

Eligibility : Any first level degree with +2 level for
Commerce and Non-Commerce students.
Medium of Instruction : English
Total No. of Theory Papers : Two
Total No. of Project/Training : One
Duration of Examination : Three hours
Question Pattern :
PART A (10 X 1 = 10 Marks) – Objective type
PART B (5 X 6 = 30 Marks) – Either or Type
PART C (5 X 12 = 60 Marks) – Either or Type

Subjects	Title of the Papers	No. of Credits	Contact hours	Passing min. marks	Max. Marks
1	Introduction to Retailing	6	90	40	100
2	Retailing Management	6	90	40	100
3	Project	8	120	40	100
	Total	20	300		

A candidate shall be declared to have passed in theory paper / project, if he / she obtain a minimum of 40 marks in the external examinations. This course is one year duration for under graduate for Commerce & Non-Commerce students.

Paper – I
INTRODUCTION TO RETAILING

Unit – I:

Retailing – meaning - definition - functions of a Retailer – Features of Retailing.

Unit – II:

Retailing in India – main drives of retailing in India – organised and unorganised retailing in India – Trends and opportunities for organised retailing in India.

Unit – III :

Types of Retailers - Impact of Economic slowdown on Indian Retailing – Future prospects of Retailing in India – Challenges to Retail Development in India.

Unit – IV:

Retail consumer – The buying process – types of Buying Decisions. Factors affecting consumer Decision making.

Unit – V:

Factors influencing the Retail shopper – consumer service in retailing – consumer profiling.

Reference Books:

1. Retail marketing :S. Banumathy & M. Jeyalakshmi
2. Retailing: An Introduction by Roger Cox,Paul Brittain (Pearson)
3. Retailing Emerging Global trend by A V Balakrishna (ICFAI)
4. Retailing Management: Text and Cases - Tata McGraw-Hill Education – Swapna Pradhan
5. Retail Marketing – Dr. L. Natarajan - Margham publications Chennai

Paper – II

RETAILING MANAGEMENT

Unit – I:

Merchandise mix – variables that affect the merchandise mix.
Suppliers – criteria for the selection of suppliers – buying systems – buying function.

Unit – II:

Brand management – Brand Management in Retailing – attitudes and benefits of Brands – Leading Brand names in India – change of Brand logos for creating new markets.

Unit – III:

Retail Pricing – factors influencing pricing – pricing objective – Establishing Retail Price – Retail Pricing Policies – Price adjustments – consumer response to prices.

Unit – IV:

Retail location strategies – Factors influencing Retailers choice - Types of decision on Retail location - location site and types of Retail development retail.

Unit – V:

Retail promotional mix – elements – advertising – public relations – personal selling – sales promotion.

Reference Books:

1. Retail Management: A Realistic Approach - Global India Publications - Neelesh Jain
2. Retailing Management: Text and Cases - Tata McGraw-Hill Education – Pradhan
3. Retail Management by Chetan Bajaj, Rajnish Tuli & Nidhi Varma Srivastava (Oxford)
4. Retailing Management by Michael Levy, Barton A Weitz, Ajay Pandit (Tata McGraw Hill)
5. Retail Marketing – Dr. L. Natarajan - Margham publications, Chennai

PAPER III
PROJECT WORK

Sl. No.	Components	Marks
1	Project report	60
2	Viva-voce	40
Total		100

Note:

- 1) The project for certificate course (Carrier Oriented programme) should be a “Group projects”. Each Group should contain maximum of 5 students.
- 2) At the end of the course the project report evaluation will be done centrally and viva-voce will be conducted by both the external examiner and the guide.

MODEL QUESTION PAPER

Code No:

Sub. Code:

CERTIFICATE COURSE IN RETAILING

APRIL 2014

Non-Semester

Time : 3 Hours

Max. Marks : 100

PART A (10X1 = 10 Marks)

Answer all the Questions

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

PART B (5 X 6 = 30 Marks)

Answer all the Questions

11. (a)
(Or)
(b)
12. (a)
(Or)
(b)
13. (a)
(or)
(b)
14. (a)
(or)
(b)

15. (a) (or)
(b)

PART C (5X12 = 60)

Marks)

Answer all the Questions

16. (a) (Or)
(b)

17. (a) (Or)
(b)

18. (a) (or)
(b)

19. (a) (or)
(b)

20. (a) (or)
(b)

APPENDIX – AZ22

MANONMANIAM SUNDARANAR UNIVERSITY, Tirunelveli-12

CERTIFICATE COURSE IN COMMUNICATIVE ENGLISH

under Career Oriented Programme

(For those who joined the course from the academic year 2012 - 2013)

1. **Course** : Certificate Course in Communicative English

2. **Medium of Instruction and Examination:** English

3. **Eligibility for Admission:**

A candidate shall be eligible for admission to Certificate Course in Communicative English if he/ She is a student of any Under Graduate Degree

4. **Course structure**

The name of the Papers, Credits, Contact Hours and Minimum and Maximum Marks for end semester examinations are listed below.

Sl. No	Sub. Code	Name of the Paper	Credits	Contact Hours	Marks	
					Min.	Max.
1		Listening Skills	6	90	40	100
2		Oral Communication Skills	6	90	40	100
3		Practicals	8	120	40	100
Total			20	300		300

5. **Examination**

Pattern of Question Paper (Maximum 100 Marks, 3 Hours)

Part A- Two Multiple Choice Questions from each unit for 1 mark each. (10 Questions) 10 marks

Part B- One Internal Choice Question from each unit for 6 marks each. (5 Questions) 30 marks

Part C- One Internal Choice Question from each unit for 12 marks each. (5 Questions) 60 marks

6. **Project Work**

The project work of the group that consists of 3 students will be evaluated based on the report submitted at the end of the certificate course. The performance of the group will be evaluated by the external examiner in the Viva – Voce examination for 40 marks. The external examiner will evaluate the report for 60 Marks.

The student will get pass in Project Work if he/she scores a minimum of 40 marks including report and Viva-Voce.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12
UGC – CAREER ORIENTED PROGRAMME
CERTIFICATE COURSE IN COMMUNICATIVE ENGLISH

(FOR THOSE WHO JOINED THE COURSE FROM THE ACADEMIC YEAR 2012-2013)

- 1) Scheme of Examination : As per UGC scheme followed by the University
- 2) Eligibility for admission : Any UG student admitted by the college as per M.S.University norms into a UG Programme conducted by Manonmaniam Sundaranar University, Triunelveli.
- 3) Qualification norms for appointment of Teachers } Any teacher who qualifies himself/herself as per UGC norms may be appointed

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12

**UGC – CAREER ORIENTED PROGRAMME
CERTIFICATE COURSE IN COMMUNICATIVE ENGLISH**

(FOR THOSE WHO JOINED THE COURSE FROM THE ACADEMIC YEAR 2012-2013)

Paper	Name of the Paper	No. of Credits	Contact Hours	Min. Pass Marks	Max Marks
Paper I	Listening Skills	6	90	40	100
Paper II	Oral Communication Skills	6	90	40	100
Paper III	Practicals i) Practicals in Listening Skills ii) Practicals in Oral Communication Skills iii) Practicals in Written Communication Skills	8	120	40	100
		20	300		300

- Internal- 40 marks
External – 60 marks

Syllabus for Certificate Course in Communicative English

Paper I Listening Skills

- Unit 1 Listening , Reading, Speaking, Writing
- Unit 2 Difference between Hearing and Listening
Barriers to listening
- Unit 3 Listening as a Process
Modes of Listening
- Unit 4 Factors affecting Listening
- Unit 5 Measures to improve Listening

Paper II Oral Communication Skills

- Unit 1 Greeting, Introducing, Requesting, Offering help and
Giving Instructions
- Unit 2 Group Discussions, Debate, Role Play, Interviews
- Unit 3 Presentation Skills: Description of people, places events
and things, Making short formal speeches
- Unit 4 Sounds in English, Vowel and Consonant Sounds,
Accent, Rhythm and Intonation
- Unit 5 Difference between speeches and presentation , Welcome
speeches, Felicitation speeches, Commemorative speeches and
Farwell speeches

**Paper III Practicals in Listening Skills, Oral Communication Skills and
Written Communication Skills**

(Note: Students may be asked to pick lots asking them to listen to recorded speeches and respond, to make presentations, to do role play or deliver speeches. They may also be asked to do creative writing)

Recommended Books:

Klippel Friederike: Keep Talking: Communicative Fluency Activities

Taylor Grant : English Conversation Practice

Terry O'Brien: Little Red Book Punctuation

Terry O'Brien: Effective Speaking Skills

English Gurunathan Publication: Who's afraid of Spoken English?

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12
UGC – CAREER ORIENTED PROGRAMME
CERTIFICATE COURSE IN COMMUNICATIVE ENGLISH

Time: 3hrs

Maximum: 100 marks

Part A – 10x2=20

Answer the following question in about 50 words each.

1. Comment on the four components that are crucial to listening skills.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Part B—5x6=30

Answer the following questions in about 250 words choosing either (a) or (b)

11. a . Discuss the importance of reading .

or

b. Briefly discuss the characteristic traits involved in speaking.

- 12.
- 13.
- 14.
- 15.

Part C – 5x10=50

Answer the following questions in about 500 words choosing either (a) or (b)

16. a. discuss in detail the strategic steps taken to develop the listening skills

Or

b. Elaborate on the act of speaking in public.

17.

18.

19.

20.

APPENDIX - AZ26

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI -12

Syllabus for B.A./ B.Sc./ B.Mus Part – I Language – Sanskrit (CBCS)

(For those who joined the course from the Academic Year 2012-2013
onwards)

Third Semester

Paper III, TITLE: PROSE, GRAMMAR AND HISTORY OF SANSKRIT LITERATURE

- Unit I** : Chandrapidacaritam – Pages 1 to 13
Unit II : Chandrapidacaritam – Pages 14 to 26
Unit III : Chandrapidacaritam – Pages 27 to 40
Unit IV : Simple Sandhis (Scutva, Shtutva and Jastva Sandhis)
Unit V : History of Prose, Tales and Fables – Pages 108 to 116 and
Pages 120-128

Books Recommended:

For Unit I, II and III – Chandrapidacaritam, Published by R.S.Vadhyar & Sons,
Palakkad.

For Unit IV – Sandhi, Published by Samskrta Bharati

For Unit V – A Short History of Sanskrit Literature, Published by R.S.Vadhyar &
Sons, Palakkad.

QUESTION PAPER PATTERN

External Examination – 75 Marks

Internal Examination – 25 Marks

Time: 3Hours

Total Marks : 100

Part – A

10x1=10 Marks(Totally Objective Type)

Part - B

5x5=25 Marks

Part – C

5x8=40 Marks

MANONMANIAM SUNDARANAR UNIVERSITY

Syllabus for B.A./ B.Sc./ B.Mus Part – I Language – Sanskrit (CBCS)

(For those who joined the course from the Academic Year 2012-2013 onwards)

Fourth Semester

Paper IV, TITLE: DRAMA, POETICS AND HISTORY OF SANSKRIT LITERATURE

- Unit I** : Madhyamavyayoga – Upto Sloka 25
Unit II : Madhyamavyayoga – Upto the end of the play
Unit III : Selected Alankaras:
Upama, Ananvaya, Apahnuti, Dipakam
Unit IV : Ullekha, Slesa, Vyatireka, Smrti, Bharanti and Sandeha
Unit V : History of Dramas – Pages 129 to 157

Books Recommended:

For Unit I, and II – Madhyamavyayoga, Published by R.S.Vadhyar & Sons, Palakkad.

For Unit III and IV – Kuvalayananda of Appayya Dikshita, Published R.S.Vadhyar & Sons, Palakkad.

For Unit V – A Short History of Sanskrit Literature, Published by R.S.Vadhyar & Sons, Palakkad.

QUESTION PAPER PATTERN

External Examination – 75 Marks

Internal Examination – 25 Marks

Time: 3Hours

Total Marks : 100

Part – A

10x1=10 Marks (Totally Objective Type)

Part - B

5x5=25 Marks

Part – C

5x8=40 Marks

APPENDIX - AZ27

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

CHOICE BASED CREDIT SYSTEM

COURSE STRUCTURE FOR PART – II ENGLISH

(For those who joined the course from the Academic Year 2012 – 2013 onwards)

(Semester III And Semester IV)

Talking into consideration the basic criterion of employability of the budding graduates, the syllabus for Part II English for UG courses has been revised. This revised syllabus framed under the choice Based Credit system aims at strengthening the communicative competence of the under graduate students. It focuses on improving all the four skills namely listening, speaking, reading and writing English, thus enabling the students to fare better in the job market.

OBJECTIVES

1. To build the vocabulary of the students
2. To give an exposure to grammar and usage
3. To develop their language skills through literature
4. To enable the students to read meaningfully and critically
5. To train them in the listening skill and help them to speak with clarity and confidence.
6. To help them write well-organised and correct English.

METHODOLOGY

To achieve these ends, the Board recommends communicative language methods centred on task based, interactive and learner – oriented approach.

SCHEME OF EXAMINATIONS IN PART II ENGLISH (REVISED AND NEW)

Semester/ Title of the Paper	Teaching Hours	Exam. Hours	Max. Marks	Internal Marks	External Marks	Overall Passing Minimum
SEMESTER III						
Prose, Drama, Fiction, Language, Study And Composition	6 hrs. Per Week	3	100	25	75	40
Semester IV						
Prose, Poetry, Communicative Grammar And Composition	6 hrs. Per Week	3	100	25	75	40

- ☞ The minimum pass mark in the external examination is 30 marks.
- ☞ For even semesters, the higher marks scored in one of the three written examinations and assignment will be taken for the calculation of internal marks.
E.g. Test I. 13/20; Test II. 14/20; Test III. 15/20
Highest of the three test marks & assignment for 5 marks=15+5=20 marks

TRANSITORY PROVISION

The new syllabus comes into effect from June 2012 and will be valid till April 2015. However students with arrears will be able to appear for examinations in this syllabus till the end of the academic year 2017 – 2018.

SECOND YEAR - SEMESTER III

PROSE, DRAMA, FICTION, LANGUAGE STUDY AND COMPOSITION

UNIT I PROSE	Prescribed Essays	(2 hours)
1. On Saying Please	: A.G. Gardiner	
2. How I became a Public Speaker	: George Bernard Shaw	
3. Shyness My Shield	: M.K. Gandhi	
4. Buddha The Light of Asia	: Ernest O Hauser	
UNIT II DRAMA		(1 hour)
TARA	: Mahesh Dhattani	
UNIT III FICTION		(1 hour)
GREAT EXPECTATIONS (Abridged)	: Charles Dickens	
UNIT IV LANGUAGR STUDY		(1 hour)
VOCABULARY		
UNIT V COMPOSITION		(1 hour)
Group Discussion		
Paragraph Writing		
Review Writing (books and film)		

TEXT BOOKS

1. PROSE AND POETRY COLLECTIONS FOR UNDER GRADUATES. Ed. by The Members of the Board of Studies Part II English, MS University – Tirunelveli. Manimekala Publication.
2. TARA : Mahesh Dhattani. Surjeet Publication, New Delhi.
3. GREAT EXPECTATIONS : Charles Dickens (Second Edition) Ed. by Patricia Atkinson, Macmillan Publication.
4. LANGUAGE STUDY AND COMPOSITION. Edited by The Members of the Board of Studies Part II English, MS University – Tirunelveli. Harrows Publication.

SECOND YEAR - SEMESTER IV

PROSE, POETRY, COMMUNICATIVE GRAMMAR AND COMPOSITION

UNIT I : PROSE **Prescribed Essays** (2 hours)

- | | |
|------------------------|---------------------|
| 1. Tight Corners | : E.V. Lucas |
| 2. Three Days to See | : Helen Keller |
| 3. Science and Culture | : Laurence M. Gould |
| 4. Spring Time | : O'Henry |

UNIT II : POETRY (1 hour)

- | | |
|---|-----------------------|
| 1. Lead, Kindly Light | : Cardinal Newman |
| 2. The Paper Boat | : Rabindranath Tagore |
| 3. "Shall I Compare Thee to a summer's Day? "
(Sonnet XVIII) | : William Shakespeare |
| 4. My Last Duchess | : Robert Browning |
| 5. Mending Wall | : Robert Frost |

UNIT III :COMMUNICATIVE GRAMMAR(TEXT:FORM AND FUNCTION) (1 hour)

Chapter I,II, III, IV, V

UNIT IV : COMMUNICATIVE GRAMMAR Contd... (1
hour)

Chapter VI, VII, IX, X, XII

UNIT V:COMPOSITION (1
hour)

Comprehension Writing

Agenda Writing

Minutes Writing

Advertisement Writing

TEXT BOOKS

1. PROSE AND POETRY COLLECTION FOR UNDER GRADUATES. Ed.
by The

Members of the Board of Studies Part II English, MS University-
Tirunelveli.

Manimekala Publication.

2. FORM AND FUNCTION (A Communicative Grammar for Colleges). Ed.
by

V.Sasikumar & V. Syamala. Emerald Publishers.

3. LANGUAGE STUDY AND COMPOSITION. Ed. by The Members of the
Board of

Studies Part II English, MS.University- Tirunelveli. Harrows Publication.

APPENDIX – AZ29**Manonmaniam Sundaranar University****Tirunelveli - 627 012****B.A. English Literature (CBCS)****(For those who joined from the academic year 2012 -13 onwards)****III Semester**

	Components	Hours	Credits
Part I	Language (1 course)	6	3
Part II	English (1 course)	6	3
Part III	Core Subjects (1 course)	6	5
	Allied Subject (1 course)	6	5
Part IV	Skill based Subject (1 course)	4	4
	Non – major Elective (1 course)	2	2
	Total (6 courses)	30	22

IV Semester

	Components	Hours	Credits
Part I	Language (1 course)	6	3
Part II	English (1 course)	6	3
Part III	Core Subjects (1 course)	6	5
	Allied Subject (1 course)	6	5
Part IV	Skill based Subject (1 course)	4	4
	Non – major Elective (1 course)	2	2
Part V	Extension activity (NCC, NSS, YRC, YWF)		1
	Total (6 courses)	30	23

V Semester

	Components	Hours	Credits
Part III	Core Subjects (2 Courses)	14	10
	Major Elective (2 courses)	12	10
Part IV	Skilled based Subjects (common) (1 course)	4	4
	Total 5 courses	30	24

VI Semester

	Components	Hours	Credits
Part III	Core Subjects (4 Courses)	24	20
	Major Elective (1 course)	6	5
	Total (5 courses)	30	25

Total number of courses : 34

Total number of hours : 180

Total number of credits : 140

Distribution of marks between External and Internal assessment 75:25 for all courses

Pass minimum of 40% for external and overall components.

SYLLABUS

Semester III

Core V Augustan Age – 18th Century Literature

Objective:

1. Understanding texts with special reference to the periods.
2. Interpretation and appreciation of selected texts from the genres of poetry, prose and Drama.

Unit I

The Age of Pope (1700-1745)

Verse

Prose and the Drama

The Age of Johnson (1745 – 1798)

General Prose

The Novel

Verse

Text: Hudson: *History of English Literature*

Unit II

Poetry

Alexander Pope – *An Essay on Man*: Epistle II, Part I :

I know then thyself, presume not God to scan

.....

Which serv'd the past, and must the times to come.

Robert Burns – My Luv is like is Red Red Rose

Thomas Gray – Elegy Written in a Country Churchyard

William Blake – The Tiger

Unit III **Prose**
 Addison and Steele:
 Sir Roger at Church
 Character of Will Wimble

Unit IV **Drama**
 Sheridan – *The Rivals*

Unit V **Fiction**
 Goldsmith - *The Vicar of Wakefield*

Allied Paper III LITERARY FORMS

Unit I Section I – Poetry Chapter II Poetical Types
 The Lyric
 The Ode
 The Sonnet
 The Elegy

Unit II
 The Idyll
 The Ballad
 The Satire

Unit III Section II – Drama Chapter II – Dramatic Types
 Tragedy and Comedy
 Tragi-Comedy
 Farce and Melodrama
 The Masque
 The One Act Play
 The Dramatic Monologue

Unit IV Section III Prose
 The Essay
 The Novel
 The short story

Unit V

Biography

Autobiography

Criticism

Text – *A Background to the study of English Literature* – B. Prasad Macmillan

Skill Based Subject: Phonetics and Spoken English

Introduction to Phonetics and Spoken English

Unit I - Vowels, Stress

Unit II - Consonants, Intonation

Unit III - Transcription of words, sentences and marking of stress

Unit IV - At a Bank I – At a Bank, II – At a hotel reception Hall, Helping a friend to obtain a flat I, II and III –

A discussion between two friends

Booking Accommodation at an outstation hotel, Enquiring about flight/Arrivals. Enquiry for information. At the Restaurant, Visiting a Doctor, At the library

Unit V - Greeting, Introduction, Information, Invitation, Permission, Request, Offers, Compliments, Sympathy, Apology

Complaint, Gratitude, Persuasion, Suggestion, Warning, Opinion, Turn taking, Interview, Group Discussion, Public Speaking

Texts 1. *English Phonetics for Beginners* – P. Iyyadurai - Jones Publication

2. *Spoken English* by Jayashree Balan (Vijaya Publication)

3. *Spoken English* – Saraswathy and Noorjahan

Non Major Elective: English for Competitive Examination

Unit I Chapter 1 - Vocabulary (Pages 96-134)

Words often Confused

Synonyms

Antonyms

Unit 2. Chapter 2 and 3

Choice of words

Analogy Questions

Unit 3 Chapter 4 - Grammar

Articles

Prepositions

The Use of Some Tenses

Conditional Clauses

Question Tags

Subject – Verb Agreement

Unit 4 Chapters 5 and 6

Spotting the Errors

Coherence

Unit 5 Chapter 7 Reading Comprehension

Text: English for Success – G. Radhakrishnan Pillai. Emerald Publishers

Semester IV

Core VI

Romantic Age

Objective :

1. Understanding texts with special reference to the periods.
2. Interpretation and appreciation of selected texts from the genres of poetry, prose and Drama.

Unit I	The Age of Wordsworth (1798 – 1832)
	The Older Poets
	The Younger Poets
	General Prose
	The Novel

Text : Hudson : *History of English Literature*

Unit II	Poetry
	Wordsworth - Ode on Intimations of Immortality
	Coleridge - Christabel
Unit III	Poetry
	Keats - Ode on a Grecian Urn, Eve of St. Agnes
	Shelley - Ode to the West Wind
	Byron - The Prisoner of Chillon
Unit IV	Prose
	Charles Lamb: Dream Children Poor Relations
	Hazlitt Indian Jugglers
Unit V	Fiction
	Jane Austen <i>Emma</i>

Allied Paper IV Literary Critics

Unit I

Plato
Aristotle

Unit II

Philip Sidney
Ben Jonson

Unit III

Dryden
Dr. Johnson

Unit IV

William Wordsworth
S.T. Coleridge

Unit V

Matthew Arnold
T.S. Eliot

Text: *An Introduction to English Criticism* by B. Prasad

Skill-based Subject

Effective communication

General Objective:

The paper aims to fulfill the long felt need to help the undergraduate students, who share a common dream of achieving career success to improve their communicative competence in English both in speaking and writing, by providing them with down-to-earth sensible and stimulating guidance.

Specific Objectives:

The course will enable the students to

1. Carry on conversation in different communication contexts such as face to face communication, telephonic communication, viva voce interview etc.,
2. Participate actively in group discussions and exchange ideas or attempt to reach a decision on shared problems.

3. Improve their ability to read fast with better understanding.
4. Express themselves clearly and concisely using tight words in right places as they will be enabled to add new words to their present vocabulary. (Words, Phrases and idioms)
5. Prepare well-organized curriculum vitae (resume/bio-data) Project report, long essay, and term paper.
6. Prepare effectively formal and informal letters applications, memos, Emails and faxes.

II. The Structure of the paper

The paper consists of the following five units

Unit I :	Listening
Unit II:	Speaking
Unit III:	Reading
Unit IV:	Writing
Unit V:	Vocabulary Building

III Methods

All four skills – listening, speaking, reading, writing are developed through a wide-ranging tasks.

Unit I: Listening

Listening to audio and video tapes of conversations and speeches, announcements instructions and making notes.

Unit II: Speaking

Using correct expressions in given situations/contexts.

Role-play, narration of jokes, commentary on (Important) events, festivals and matches, conducting quizzes, Introducing VIPs and welcoming an audience, proposing vote of thanks, compeering college functions or youth festivals, sports events, miming radio/TV announcements making simple advertisements, conducting interviews, presenting reports, group discussion.

Unit III: Reading

- Providing exercises to test the students' ability to read and comprehend.
- Tasks or passages to improve the students average reading speed. Extensive readers maybe included
- Passages of different types – narrative, descriptive and explorative, may be used as class room materials to train students in different types of reading

Unit IV Writing

- Tasks, assignments, exercises on various current topics may be provided
- Report writing, preparing agenda and writing minutes for meetings effective use of SMS, applying for job, resume and effective profiling
- Emergency communication through print and Electronic media.

Unit V Vocabulary

Traditional and innovative tasks may be devised

Text: Effective Communication by Dr. R. Babu Sivaraja Kirubanithi, Dr. A. Nihamathullah, Dr. C. Rajeswari. A Publication of Manonmaniam Sundaranar University

Non – Major Elective

Business English

Text Book: Commercial Correspondence and office Management – Part I Chand and Company Ltd.

Ramnagar, New Delhi – 110 055

Unit I

Communication in Business
A Good Business Letter
Commercial Correspondence
Format of Business Letters
Avoid Commercial Jargon
Grammar

Unit II

Punctuation
Circular Letter
Sales Letters
Follow up Letters
Trade Enquires
Offers and Quotations

Unit III

Trade Order
Status Enquiry
Confirmation of Orders
Complaints and their Adjustments
Collection Letters
Making Payments

Unit IV

Application for Situation
Banking Letters
Agency Correspondence
Corresponding with the Government
Drafting of Reports
Secretarial Correspondence

Unit V

Import Trade Correspondence
Export Trade Correspondence
Writing of Minutes
Letters to Editors and Complaints to Personnel
Insurance Correspondence
The Speech of the Chairman of a Company

Semester V

Core VII Pre-Raphaelite Age and Victorian Age

Unit I The Age of Tennyson (1832 – 1887)

Verse

General Prose

The Novel

Age of Hardy

Text : Hudson: History of English Literature

Unit II Poetry

Tennyson Lotos eaters

Browning Andrea Del Sarto

Mathew Arnold Forsaken Merman

Rossetti The Blessed Damozel

Unit III Prose

Ruskin : *King's Treasuries (Sesame and Lilies)*

Unit IV Drama

John Galsworthy : *Justice*

Unit V Fiction

George Eliot : *Silas Marner*

Core VIII The Age of Hardy and Modern Age

Unit I

The Age of Hardy }
The Present Age } (1887 – 1955)

Text : Hudson: History of English Literature

Unit II	Poetry	
	Hopkins	The Windhover
	T. S. Eliot	The Love Song of Alfred. J. Prufrock
	W.H. Auden	The Shield of Achilles
	W.B. Yeats	The Second Coming
Unit III	Prose	
	Eliot:	Hamlet and his Problems
Unit IV	Drama	
	Bernard Shaw	<i>Pygmalion</i>
Unit V	Fiction	
	Thomas Hardy	<i>The Mayor of Caster bridge</i>

Electives – Select 2 out of 3

I. CANADIAN LITERATURE

UNIT I

Prose

Catharine Parr Traill	The Backwoods of Canada
Sara Jeannette Duncan	From the Imperialist
Sinclair Ross	As for me and my house
Alice Munro	The Photographer

UNIT II

Poetry

Phyllis Webb	Marvell's Garden
George Bowering	Grandfather
Alpurdy	Elegy for a grandfather
George Elliott Clark	How Exile Melts to one hundred roses

UNIT III

Short story

Stephen Leacock

The Hosterly of Mr. Smith

The Ministrations of the Rev.Mr. smith

The Whirlwind Campaign of Mariposa

The Beacon on the Hill

UNIT IV Drama

Sharon Pollock *Blood Relations*

UNIT V Fiction

Margaret Laurence : *Fire - Dwellers*

II. Women's Writing

Unit I

Virginia Woolf: *A Room of One's Own*. Chapters 1 and 2

Unit II

- | | | |
|---------------------|---|--|
| Maya Angelou | - | I know why the Caged Bird Sings
A Brave and Startling youth |
| P.K. Page | - | Photos of a Salt Line
Stories of Snow |
| Yasmine Gooneratne- | | On an Asian Poet Fallen Among
American Translators
There was a Country |
| Sarojini Naidu | - | Indian Weavers
Song of Radha, The Milk Maid |

Unit III

Margaret Atwood – Hair Jewellery

Bharati Mukherjee - A Wife's Story

Amy Tan - A pair of Tickets

Edith Wharton - Afterward

Unit IV

Manjula Padmanabhan *The Harvest*

Unit V

Shashi Deshpande : *The Dark Holds No Terrors*

Text : The Oxford book of Modern Women's Stories, Patricia Craig

III. English Language Teaching

Objective: To make the learners aware of various language learning methods and the importance of language skills.

Unit I – Introduction of English Language Teaching

1. Problems and principles of English Language Teaching
2. English as an international language
3. The role of English in India; is it a second language or foreign language?
4. Objective of Teaching English at the undergraduate level

Unit II – Instructional Strategies

1. Grammar Translational Method
2. Direct Method
3. Michael West Method
4. Structural Approach
5. Situational Approach
6. Communicative Approach

Unit III – Methods and Objectives of Teaching Language and Literature

1. The Teaching of Prose
2. The Teaching of Poetry
3. The Teaching of Grammar
4. The Teaching of Composition
5. The Teaching of Extensive Reader

Unit IV – Basic Skills

1. Listening
2. Speaking
3. Reading
4. Writing

Unit V – Modern Methods of Teaching Language

1. Activities in English Teaching
2. Audio – Visual Aids
3. Computer Aided Language Learning
4. Learner Centered Teaching

Text Book

Dr. Vincent. S., *The Teaching of English*, Soundra Publication, Madurai, 2007.

Recommended Reading:

1. Tickoo, M.L., *English Language Teaching*, Orient Longman, Hyderabad, 2003.
2. Richard, Jack. C and Theodore. S Rodgers, *Approaches and Methods in English Teaching*, CUP, 1986.
3. Krishnaswamy, N and SriRaman. T. *English Teaching in India*, T.R. Publications, Madras, 1994.
4. Geetha Nagarajan., *English Language Teaching approaches Methods Techniques*, Orient Longman, Calcutta, 1996.

Semester VI
Core IX - Shakespeare

Unit I

1. Shakespeare's stage and Audience
2. Shakespearean comedy
3. Shakespearean Tragedy
4. Shakespeare's historical plays
5. Last plays of Shakespeare
6. Shakespeare's Sonnets

Unit II

Merchant of Venice

Unit III

King Lear

Unit IV

Henry IV – Part I

Unit V

The Tempest

Core X - Contemporary Literature

Unit I Post War and Postmodern Literature

from Sanders, Andrew. *Short Oxford History of English literature* 3rd ed

Unit II

Poetry

Philip Larkin	The Whitsun Weddings
Ted Hughes	Thought Fox, Hawk roosting
Andrew Motion	Better Life, The Dog of the Light Brigade
Carol Ann Duffy	Mrs. Lazarus, Circe

Unit III	Fiction		
		Kinsley Amis	Lucky Jim
Unit IV	Fiction		
		Yann Martel	Life of Pi
Unit V	Drama		
		Bertolt Brecht	<i>Mother Courage and Her Children</i>

Core XI - Literary Criticism and Theory

Unit I

The moral Approach : Literature and Moral Ideas T.S.
 Eliot – Religion and Literature

Unit II

The Psychological approach: Literature and Psychological Theory
 The Myth in Jane Austen – Geoffrey Gorer

Unit III

The sociological approach: Literature and Social Ideals
 Joseph wood Krutch “The Tragic Fallacy”

Unit IV

The Formalistic approach: Literature as Aesthetic Structure
 Cleanth Brooks: Keats’s Sylvan Historic : History without footnotes

Unit V :

The Archetypal approach : Literature in the Light of myth Gilbert Murray ‘Hamlet and Orestes’

Text – Five Approaches of Literary Criticism, Wilbur Scott

Core XII – Regional Literature in Translation

Unit I

Tirukkural

Chapter 4 – The Power of Virtue

Chapter 7 – The Wealth of Children

Chapter 9 – Hospitality

Chapter 11 – Gratitude

Chapter 13 – Self Control / Restraint

Unit II

Raj Gauthaman : Dalit Culture

Lovely Stephen: Dalit Women: The Problem of Self Emancipation

Text:

No Alphabet in Sight: New Dalit Writing from South India ed : K. Satyanarayana

Unit III

Bama : *Karukku*

M. Mukundan : *Dance*

Unit IV

Girish Karnad : *Yayati*

Unit V

Short Stories from Sundara Ramaswamy's *Waves*

Elective 1 AFRICAN LITERATURE

UNIT I Poetry

David Diop	Africa
Wole Soyinka	Telephonic Conversation
John Pepper Clark	Night Rain
Chinua Achebe	Refugee Mother and Child
Noemia De Sousa	If you want to know me

UNIT II Poetry

Bernard Dade	I thank you God
Dennis Brutus	You Laughed and Laughed and Laughed
Gabriel Okara	Once upon a Time
David Rubadiri	A Negro Labourer in Liverpool

UNIT III Drama

Wole Soyinka	Death and the King's Horseman
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UNIT IV Fiction

Chinua Achebe	Things Fall Apart
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UNIT V Non-Fictional Prose

Achebe	The Novelist as Teacher
Ben Okri	Incident at the Shrine

Text Prescribed : *An Anthology of Commonwealth Poetry*

Ed. C.D. Narisimhaiah

Elective 2 Journalism and Mass Communication

Unit I Communication

What is Communication
Forms of Communication
Mass Communication
The power of Mass Media
Mass Media Culture and Function of Mass media

Unit II Journalism

A Short History of Indian Journalism
Theories of Press/Media
The role of the press
Freedom of the press
Press codes and ethics

Unit III Print Media

News and News Values
The Making of a Newspaper
Kinds and Sources of News, News Agencies
Five 'W's and 'H'

Unit IV Radio, Television and Films

Types of Radio programmes
Types of TV programmes
Types of Films
Plot , Scriptwriting, Direction

Unit V Digital Media

Introducing the digital media/ Internet
Citizen Journalism – Blogs, Social Networking Sites
Creation of Websites and Blogs
Texts for Reference : Mass Communication in India : Keval . J. Kumar
Exercises in Media Education: Peter Gonsalves. Pub: Don Bosco
Communication, Mumbai

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI - 12

B.A. English with Computer Applications

Syllabus – II and III year

(III, IV, V and VI Semesters)

III Semester

	Components	Hours	Credits
Part I	Language (1 course)	6	3
Part II	English (1 course)	6	3
Part III	Core Subjects (1 course)	6	5
	Office Automation (1 course)	6	5
Part IV	Skill based Subject (1 course)	4	4
	Non – major Elective (1 course)	2	2
	Total (6 courses)	30	22

IV Semester

	Components	Hours	Credits
Part I	Language (1 course)	6	3
Part II	English (1 course)	6	3
Part III	Core Subjects (1 course)	6	5
	Internet and HTML-Part-I (1 course)	6	5
Part IV	Skill based Subject (1 course)	4	4
	Non – major Elective (1 course)	2	2
Part V	Extension activity (NCC, NSS, YRC, YWF)		1
	Total (6 courses)	30	23

V Semester

	Components	Hours	Credits
Part III	Core Subjects (2 Courses)	14	10
	Major Elective (1 courses)	6	5
	Internet and HTML-Part-II	6	5
Part IV	Skilled based Subjects (common) (1 course)	4	4
	Total 5 courses	30	24

VI Semester

	Components	Hours	Credits
Part III	Core Subjects (4 Courses)	24	20
	C Programming (1 course)	6	5
	Total (5 courses)	30	25

Total number of courses : 34

Total number of hours : 180

Total number of credits : 140

Distribution of marks between External and Internal assessment 75:25 for all courses

Pass minimum of 40% for external and overall components.

SYLLABUS

Semester III

Core V Augustan Age – 18th Century Literature

Objective:

1. Understanding texts with special reference to the periods.
2. Interpretation and appreciation of selected texts from the genres of poetry, prose and Drama.

Unit I

The Age of Pope (1700-1745)

Verse

Prose and the Drama

The Age of Johnson (1745 – 1798)

General Prose

The Novel

Verse

Text: Hudson: *History of English Literature*

Unit II

Poetry

Alexander Pope – *An Essay on Man*: Epistle II, Part I :

I know then thyself, presume not God to scan

.....

Which serv'd the past, and must the times to come.

Robert Burns – My Luv is like is Red Red Rose

Thomas Gray – Elegy Written in a Country Churchyard

William Blake – The Tiger

Unit III	Prose
	Addison and Steele: Sir Roger at Church Character of Will Wimble
Unit IV	Drama
	Sheridan – <i>The Rivals</i>
Unit V	Fiction
	Goldsmith - <i>The Vicar of Wakefield</i>

**Allied Paper III OFFICE AUTOMATION
(PART II)**

UNIT I

PowerPoint: Creating PowerPoint presentations: Creating a basic presentation, building presentations, modifying visual elements.

UNIT II

Formatting and checking text, Adding objects, Applying transitions.

UNIT III

Animation effects and linking, preparing handouts, Taking the show on the road.

UNIT IV

Access: Tracking data with Access: Planning and creating tables, Creating and using forms, Modifying tables.

UNIT V

Working with external data, Creating relational database, Enhancing form design, Producing reports, Creating queries.

Text Book

Gini Courter & Annette Marquis, MICROSOFT OFFICE 2007 No experience required, BPB Publications

Reference Book

Stephen L. Nelson - Office 2007: The Complete Reference, Tata McGraw Hill Education Private Limited.

PRACTICAL: OFFICE AUTOMATION (PART II)

MS POWER POINT

1. Creating a Presentation from Scratch
2. Creating a Presentation using Design Template
3. Creating an Animated Presentation with Sound Effect
4. Creating a Presentation about your Personality

MS ACCESS

1. Mark List Creation
 2. Salary List Preparation
 3. Electricity Bill Generation
 4. Report Generation
 5. Creation of Mailing Labels
-

Skill Based Subject: Phonetics and Spoken English

Introduction to Phonetics and Spoken English

- | | | | |
|----------|---|---|--|
| Unit I | - | Vowels, Stress | |
| Unit II | - | Consonants, Intonation | |
| Unit III | - | Transcription of words, sentences and marking of stress | |
| Unit IV | - | At a Book store, I – At a Bank, II – At a hotel reception hall, helping a friend to obtain a flat | |

I, II and III – A discussion between two friends

Booking Accommodation at an outstation hotel, Enquiring about flight. Enquiring for information. At the Restaurant, Visiting the Doctor, At the library

Unit V - Greeting, Introduction, Information, Invitation, Permission, Request, Offers, Compliments, Sympathy, Apology
Complaint, Gratitude, Persuasion, Suggestion, Warning, Opinion, Turn taking, Interview, Group Discussion, Public Speaking

Texts
1. *English Phonetics for Beginners* – P. Iyyadurai - Jones Publication
2. Spoken English by Jayashree Balan (Vijaya Publication)
3. Spoken English – Saraswathy and Noorjahan

Non Major Elective: English for Competitive Examination

Unit I Chapter 1 - Vocabulary (Pages 96-134)

Words often Confused

Synonyms

Antonyms

Unit 2. Chapter 2 and 3

Choice of words

Analogy Questions

Unit 3 Chapter 4 - Grammar

Articles

Prepositions

The Use of Some Tenses

Conditional Clauses

Question Tags

Subject – Verb Agreement

Unit 4 Chapters 5 and 6
Spotting the Errors
Coherence

Unit 5 Chapter 7 Reading Comprehension

Text: English for Success – G. Radhakrishnan Pillai. Emerald Publishers

Semester IV

Core VI Romantic Age

Objective :

1. Understanding texts with special reference to the periods.
2. Interpretation and appreciation of selected texts from the genres of poetry, prose and Drama.

Unit I The Age of Wordsworth (1798 – 1832)
The Older Poets
The Younger Poets
General Prose
The Novel

Text : Hudson : *History of English Literature*

Unit II Poetry
Wordsworth - Ode on Intimations of Immortality
Coleridge - Christabel

Unit III Poetry
Keats - Ode on a Grecian Urn, Eve of St. Agnes
Shelley - Ode to the West Wind
Byron - The Prisoner of Chillon

Unit IV Prose

Charles Lamb: Dream Children Poor Relations

Hazlitt Indian Jugglers

Unit V Fiction

Jane Austen *Emma*

Allied Paper IV INTERNET AND HTML

(PART I)

Unit 1: Introduction to Internet: Computers in business –Network- Internet- Electronic mail- Resource sharing –Gopher-WWW-Usenet-Telnet-Bulletin services-Wide Area information service.

Unit 2: Internet Technologies: Modem – Internet Addressing – Physical connections – Telephone lines

Internet browsers: Internet Explorer –Netscape Navigator

Unit 3: Introduction to HTML: Designing a Home page – History of HTML – HTML generations- HTML Documents-Anchor tag –Hyper links –Sample HTML documents.

Unit 4: Head and Body section: Header Section –Title-Prologue-Links-Colorful web page –Comments lines

Designing the body: Heading printing –Aligning the headings-Horizontal rule-paragraph-Tab settings-Image and pictures-Embedding PNG format Images

Unit 5: Ordered and unordered lists: List-Unordered lists- headings in a list – ordered lists- Nested lists.

Text Book:

World Wide Web Design with HTML, C. Xavier, TMH, 2001

Reference Book:

1. Internet & World Wide Web, H.M.Deital, P.J.Deital & A.B.Goldberg, Pearson Education
2. Fundamentals of information technology, Mathew's lenon and Alxis leon, Vijay Nicole private limited, Chennai.

PRACTICAL –INTERNET AND HTML (PART I)

1. Write HTML code to display information about your college.
2. Create a table to display the marks obtained in the exam.
3. Develop a complete web page to describe your skills in various areas.
4. Develop a website to publish the details of your family and each member.
5. Create a web page with Anchor tag.
6. Create web page with images.
7. Develop an HTML document to print the departments in your college as an Unordered List.
8. Develop an HTML document to print various subjects you have studied as Ordered List.

Skill-based Subject**Effective communication****General Objective:**

The paper aims to fulfill the long felt need to help the undergraduate students, who share a common dream of achieving career success to improve their communicative competence in English both in speaking and writing, by providing them with down-to-earth sensible and stimulating guidance.

Specific Objectives:

The course will enable the students to

1. Carry on conversation in different communication contexts such as face to face communication, telephonic communication, viva voce interview etc.,

2. Participate actively in group discussions and exchange ideas or attempt to reach a decision on shared problems.
3. Improve their ability to read fast with better understanding.
4. Express themselves clearly and concisely using tight words in right places as they will be enabled to add new words to their present vocabulary. (Words, Phrases and idioms)
5. Prepare well-organized curriculum vitae (resume/bio-data) Project report, long essay, and term paper.
6. Prepare effectively formal and informal letters applications, memos, Emails and faxes.

II. The Structure of the paper

The paper consists of the following five units

Unit I :	Listening
Unit II:	Speaking
Unit III:	Reading
Unit IV:	Writing
Unit V:	Vocabulary Building

III Methods

All four skills – listening, speaking, reading, writing are developed through a wide-ranging tasks.

Unit I: Listening

Listening to audio and video tapes of conversations and speeches, announcements instructions and making notes.

Unit II: Speaking

Using correct expressions in given situations/contexts.

Role-play, narration of jokes, commentary on (Important) events, festivals and matches, conducting quizzes, Introducing VIPs and welcoming an audience, proposing vote of thanks, compeering college functions or youth festivals, sports events, miming radio/TV announcements making simple advertisements, conducting interviews, presenting reports, group discussion.

Unit III: Reading

- Providing exercises to test the students' ability to read and comprehend.
- Tasks or passages to improve the students average reading speed. Extensive readers maybe included
- Passages of different types – narrative, descriptive and explorative, may be used as class room materials to train students in different types of reading

Unit IV Writing

- Tasks, assignments, exercises on various current topics may be provided
- Report writing, preparing agenda and writing minutes for meetings effective use of SMS, applying for job, resume and effective profiling
- Emergency communication through print and Electronic media.

Unit V Vocabulary

Traditional and innovative tasks may be devised

Text: Effective Communication. Publication Division, Manonmaniam Sundaranar University

Non – Major Elective

Business English

Text Book: Commercial Correspondence and office Management – Part I Chand and Company Ltd.

Ramnagar, New Delhi – 110 055

Unit I

Communication in Business

A Good Business Letter

Commercial Correspondence

Format of Business Letters

Avoid Commercial Jargon

Grammar

Unit II

Punctuation

Circular Letter

Sales Letters

Follow up Letters

Trade Enquires

Offers and Quotations

Unit III

Trade Order

Status Enquiry

Confirmation of Orders

Complaints and their Adjustments

Collection Letters

Making Payments

Unit IV

Application for Situation

Banking Letters

Agency Correspondence

Corresponding with the Government

Drafting of Reports

Secretarial Correspondence

Unit V

Import Trade Correspondence

Export Trade Correspondence

Writing of Minutes

Letters to Editors and Complaints to Personnel

Insurance Correspondence

The Speech of the Chairman of a Company

Semester V

Core VII Pre-Raphaelite Age and Victorian Age

Unit I The Age of Tennyson (1832 – 1887)

Verse

General Prose

The Novel

Age of Hardy

Text : Hudson: History of English Literature

Unit II Poetry

Tennyson Lotos eaters

Browning Andrea Del Sarto

Mathew Arnold Forsaken Merman

Rossetti The Blessed Damozel

Unit III Prose

Ruskin : *King's Treasuries (Sesame and Lilies)*

Unit IV Drama

John Galsworthy : *Justice*

Unit V Fiction

George Eliot : *Silas Marner*

Core VIII The Age of Hardy and Modern Age

Unit I

The Age of Hardy	}	(1887 – 1955)
The Present Age		

Text : Hudson: History of English Literature

Unit II

Poetry

Hopkins	The Windhover
T. S. Eliot	The Love Song of Alfred. J. Prufrock
W.H. Auden	The Shield of Achilles
W.B. Yeats	The Second Coming

Unit III

Prose

Eliot:	Hamlet and his Problems
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Unit IV

Drama

Bernard Shaw	<i>Pygmalion</i>
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Unit V

Fiction

Thomas Hardy	<i>The Mayor of Caster bridge</i>
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Electives – Select 1 out of 2

I. CANADIAN LITERATURE

UNIT I

Prose

Catharine Parr Traill	The Backwoods of Canada
Sara Jeannette Duncan	From the Imperialist
Sinclair Ross	As for me and my house
Alice Munro	The Photographer

UNIT II

Poetry

Phyllis Webb	Marvell's Garden
George Bowering	Grandfather
Alpurdy	Elegy for a grandfather
George Elliott Clark	How Exile Melts to one hundred roses

UNIT III

Short story

Stephen Leacock	The Hosterly of Mr. Smith
	The Ministrations of the Rev.Mr. smith
	The Whirlwind Campaign of Mariposa
	The Beacon on the Hill

UNIT IV Drama

Sharon Pollock	Blood Relations
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UNIT V Fiction

Maria Campbell: The Half-Breed

II. English Language Teaching

Objective: To make the learners aware of various language learning methods and the importance of language skills.

Unit I – Introduction of English Language Teaching

1. Problems and principles of English Language Teaching
2. English as an international language
3. The role of English in India; is it a second language or foreign language?
4. Objective of Teaching English at the undergraduate level

Unit II – Instructional Strategies

1. Grammar Translational Method
2. Direct Method
3. Michael West Method
4. Structural Approach
5. Situational Approach
6. Communicative Approach

Unit III – Methods and Objectives of Teaching Language and Literature

1. The Teaching of Prose
2. The Teaching of Poetry
3. The Teaching of Grammar
4. The Teaching of Composition
5. The Teaching of Extensive Reader

Unit IV – Basic Skills

1. Listening
2. Speaking
3. Reading
4. Writing

Unit V – Modern Methods of Teaching Language

1. Activities in English Teaching
2. Audio – Visual Aids
3. Computer Aided Language Learning
4. Learner Centered Teaching

Text Book

Dr. Vincent. S., *The Teaching of English*, Soundra Publication, Madurai, 2007.

Recommended Reading:

1. Tickoo, M.L., *English Language Teaching*, Orient Longman, Hyderabad, 2003.
2. Richard, Jack. C and Theodore. S Rodgers, *Approaches and Methods in English Teaching*, CUP, 1986.
3. Krishnaswamy, N and SriRaman. T. *English Teaching in India*, T.R. Publications, Madras, 1994.
4. Geetha Nagarajan., *English Language Teaching approaches Methods Techniques*, Orient Longman, Calcutta, 1996.

III. INTERNET AND HTML

(PART II)

Unit 1: Table handling: Tables- table creation in HTML- Width of the Tables and cells-Cells spanning multiple rows/Columns- Coloring cells – Column specification

Unit 2: DHTML and Style sheets: Defining styles –Elements of styles- Linking a style sheet to an HTML document –Inline styles –Internal & External style sheets –Multiple styles

Unit 3: Frames: Frame set - Definition – Frame definition –Nested Frames
Web Page Design Project : Frameset Definition – Animals – Birds – Fish.

Unit 4: Forms: Action attributes –Method attributes –Enctype attribute – Drop down list- sample forms.

Unit 5: E-Commerce: The Information Technology Revolution – E-Commerce Definition – Evolution of E-Commerce – E-Commerce Growth Factors – Types of E-Commerce – Virtual Shop – The Digital Middlem – What kind of E-Commerce to use? – Benefits of E-Commerce for companies – Benefits of E-Commerce for customers.

Text Books:

1. World wide web design with HTML, C.Xavier, TMH, 2001
2. Introduction to Information Systems, Alexis Leon and Mathews Leon, Vijay Nicole private limited, Chennai.

Reference Book:

1. Internet & World Wide Web, H.M.Deital, P.J.Deital & A.B.Goldberg, Pearson Education.
2. Fundamentals of information technology, Mathews Leon and Alexis Leon, Vijay Nicole private limited, Chennai.

PRACTICAL –INTERNET AND HTML (PART II)

1. Develop a Web page to display your class Time Table.
2. Develop a colorful Web page to display your resume.
3. Develop a Web page to display the monthly calendar.
4. Develop a Web page with form.
5. Develop a complete web page using frames and framesets, which give the information about a hospital.
6. Write a few HTML documents each explaining about a district of your state. The list of districts must appear in a frame. When we click on a district, the details must appear in another frame.
7. Write a set of frames to show your biodata in a colorful form with suitable links.
8. Write a HTML code to display list of 5 cars in a frame. Link each one to the brief description in second frame.

Semester VI
Core IX - Shakespeare

Unit I

1. Shakespeare's stage and Audience
2. Shakespearean comedy
3. Shakespearean Tragedy
4. Shakespeare's historical plays
5. Last plays of Shakespeare
6. Shakespeare's Sonnets

Unit II

Merchant of Venice

Unit III

King Lear

Unit IV

Henry IV – Part I

Unit V

The Tempest

Core X - Contemporary Literature

Unit I **Post War and Postmodern Literature**

from Sanders, Andrew. *Short Oxford History of English literature* 3rd ed

Unit II

Poetry

Philip Larkin	The Whitsun Weddings
Ted Hughes	Thought Fox, Hawk roosting
Andrew Motion	Better Life, The Dog of the Light Brigade
Carol Ann Duffy	Mrs. Lazarus, Circe

Unit III	Fiction	
	Kinsley Amis	Lucky Jim
Unit IV	Fiction	
	Yann Martel	Life of Pi
Unit V	Drama	
	Bertolt Brecht	<i>Mother Courage and Her Children</i>

Core XI - Literary Criticism and Theory

Unit I

The moral Approach : Literature and Moral Ideas
T.S. Eliot – Religion and Literature

Unit II

The Psychological approach: Literature and Psychological Theory
The Myth in Jane Austen – Geoffrey Gorer

Unit III

The sociological approach: Literature and Social Ideals
Joseph wood Krutch “The Tragic Fallacy”

Unit IV

The Formalistic approach: Literature as Aesthetic Structure
Cleanth Brooks: Keats’s Sylvan Historic : History without footnotes

Unit V :

The Archetypal approach : Literature in the Light of myth Gilbert Murray
‘Hamlet and Orestes’

Text – Five Approaches of Literary Criticism, Wilbur Scott

Core XII – Regional Literature in Translation

Unit I

Tirukkural

Chapter 4 – The Power of Virtue

Chapter 7 – The Wealth of Children

Chapter 9 – Hospitality

Chapter 11 – Gratitude

Chapter 13 – Self Control / Restraint

Unit II

Raj Gauthaman : Dalit Culture

Lovely Stephen: Dalit Women: The Problem of Self Emancipation

Text:

No Alphabet in Sight: New Dalit Writing from South India ed : K. Satyanarayana

Unit III

Bama : *Karukku*

M. Mukundan : *Dance*

Unit IV

Girish Karnad : *Yayati*

Unit V

Short Stories from Sundara Ramaswamy's *Waves*

INTRODUCTION TO C PROGRAMMING

Unit I

Introduction to C: The C Character set – Identifiers and keywords – Data types – Constants – Variables – Declaration of variables.

Operators and Expressions: Arithmetic Operators – Relational and Logical Operators – Assignment Operators – Increment and Decrement operators - The Conditional Operator

Unit II

Data Input and Output: Formatted Input and Output only [ie., scanf() and printf() only].

Control Statements: The if statement - if-else Statement – nested –if - The for loop Statement (only) –The Switch Statement – The goto Statement.

Unit III

Arrays: Declaration of one dimensional array - Processing an Array – two dimensional array.

Pointers: Pointer Declarations – Simple pointer expressions - Pointers and One Dimensional Arrays.

Unit IV

User-Defined Functions: Defining a Function – Function calls – Return values and their types – Function declaration – Function with argument and return type (only) – Recursion.

Unit V

Structures : Defining a Structure – Processing a Structure

File Management in C: Defining and Opening a File – Closing a file – Input and Output operations on file.

Text Books

Programming in ANSI C , Fifth Edition, E.Balafurusamy, Tata McGraw Hill Education Private Limited

Reference Books

1. Computer Fundamentals and Programming in C, Reema Thareja, Oxford University Press
2. How to Program C, Sixth Edition, Paul Deitel and Harvey Deitel, PHI Learning Private Limited

PRACTICAL: INTRODUCTION TO C PROGRAMMING

1. Write a C program to find all the possible roots of a quadratic equation using switch statement.
2. Write a C program to evaluate the power series for a required accuracy
$$e^x = 1 + x + x^2/2! + x^3/3! + \dots + x^n/n!, 0 < x < 1$$
3. Write a C program to sort a list of numbers in descending order.
4. Write a C program to search an element in an array.
5. Write a C program to find nCr using Recursion.
6. Write a C program to multiply two matrices, if they are compatible.
7. Write a C program to check whether the given string is palindrome or not.
8. Write a C program to sort a list of names in alphabetical order.
9. Write a C program to calculate the standard deviation for a set of numbers using function.
10. Write a C program to prepare the mark sheet using structure.

APPENDIX - AZ31

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12
Choice Based Credit System
B.A. History & Tourism
SYLLABUS FOR III, IV, V and VI Semesters

III Semester

Sl. No	Components	Teaching Hours	Exam Duration	Max. Marks 100		Min. Marks	Credit
				Theory	Internal		
3.1	Part I Tamil / Other languages 1 course	6	3	75	25	40	3
3.2	Part II English (1 Course)	6	3	75	25	40	3
3.3	Part III Core Subject (1 Course) History of India from 1526 - 1772 A.D	6	3	75	25	40	5
3.4	Allied - II Any One (1 course) Economics / Sociology / Political Science	6	3	75	25	40	5
3.5	Part IV Skill-Based Subject (Any One) History of Pathfinders of Tamilnadu (1680-1975 A.D) Panchayat Raj in India with a reference to Tamil Nadu.	4	3	75	25	40	4

3.6	Non - Major Elective I (Any One) Freedom Movement in India / Gandhian Thought	2	3	75	25	40	2
	Total Course 6	30					22

IV Semester

Sl. No	Components	Teaching Hours	Exam Duration	Max. Marks 100		Min. Marks	Credit
				Theory	Internal		
4.1	Part I Tamil / Other languages (1 Course)	6	3	75	25	40	3
4.2	Part II English	6	3	75	25	40	3
4.3	Part III (Core Subject) (1 Course) History of India from 1772 - 1947 A.D	6	3	75	25	40	5
4.4	Allied II (Any One) (1 Course) Economics / Sociology/ Political Science	6	3	75	25	40	5
4.5	Part IV Skill-Based Subject (1 Course) Archaeology / Epigraphy	4	3			40	4
4.6	Non-Major Elective II (1 Course) Social Reformers of Modern India / Indian Constitution	2	3	75	25	40	2
	Part V Extension Activity NCC, NSS, YRC / YWF						1
	Total	30					23

V Semester

Sl. No	Components	Teaching Hours	Exam Duration	Max. Marks 100		Min. Marks	Credit
				Theory	Internal		
5.1	Part III Core Subjects (2 Courses) History of Tamil Nadu upto 1565 A.D	14	3	75	25	40	10
5.2	History of Europe (1453 - 1789 AD)						
5.3	Major Elective (2 courses) History of World Civilization upto 1453 A.D	12	3	75	25	40	10
5.4	Freedom movement in India since 1801 AD						
5.5	History of the Fareast (1839-1970 AD)						
5.6	Part IV Skill - Based subject (1 Course) Common	4	3	75	25	40	4
	Total Course -5	30					24

VI Semester

Sl. No	Components	Teaching Hours	Exam Duration	Max. Marks 100		Min. Marks	Credit
				Theory	Internal		
6.1	Part III Core Subjects (4 Courses) History of Tamil Nadu upto 1565 to 2000 A.D	24	3	75	25	40	20
6.2	History of Europe (1789 -1945 A.D)						
6.3	History of Science and Technology since 1500 A.D						
6.4	Working of the Indian Constitution						
6.5	Major Elective (One course) (Any one) Constitutional History of England (1603-1970 A.D)	6	3	75	25	40	5
	International Relations (1945-2000 A.D)						
	History of Russia (1800-1991 A.D)						
	Total courses -5	30					25

SEMESTER - III

Core Subject

HISTORY OF INDIA - 1526 A.D - 1772 A.D

Unit - I

- ❖ Mughal Empire - Sources - India on the Eve of Babur's invasion - Babur's early life - conquests - Administration - Humayun - Shersha.

Unit - II

- ❖ Akbar the Great - Bairamkhan - War with Rajputs Deccan Expedition – Religious Policy - Jahangir. Nurjahan.

Unit - III

- ❖ Shahjahan - Aurangzeb - Decline and Disintegration of the Mughals - Art and Architecture. Deccan Policy - Mughal Administration.

Unit - IV

- ❖ The rule of Marathas - Shivaji - Military achievements - Administration - Art and Architecture - Peshwas - Balaji Viswanath - Baj Rao - Balaj Baj Rao III – Third Battle of Panipat.

Unit - V

- ❖ Advent of the Europeans - The Anglo-French Rivalry - Carnatic wars - Robert Clive - Battle of Plassey - Buxar - Dual Government in Bengal.

BOOKS FOR REFERENCE

1. Mahajan V.D : India since 1526
2. Sri Vasthava : The Mughal Empire
3. Ishwariprasad : History of Modern India
4. Lane Poole : History of India
5. Thripathi .R.P : Rise and fall of the Mughal Empire.

SEMESTER - III
Allied - Economics
MONETARY ECONOMICS

Unit - I : Introduction

Barter - Meaning and Difficulties - Functions of Money: Primary, Secondary and Contingent - Fisher's Quantity Theory of Money.

Unit - II : Monetary Standards

Gold Standard : Types of Gold Standard - Merits and Demerits of Gold Standards. Bimetallism: Merits and Demerits of Bimetallism - Paper Currency Standard - Principles and Systems of Note Issue - Merits and Demerits of Paper Currency Standard.

Unit - III : Inflation and Deflation

Meaning of Inflation: Features - Causes and Effects of Inflation - Measures to Control Inflation. Deflation: Meaning, Features, Causes and Effects - Anti - Deflationary Measures.

Unit - IV : Commercial Banking

Definition - Functions - Role of Commercial Bank in a Developing Economy. The Balance Sheet of a Commercial Bank - Credit Creation by Commercial Banks.

Unit - V : Central Banking

Definition - Functions of a Central Bank - Methods of Credit Control - Role of Reserve Bank of India in the Economic Development of the Nation.

BOOKS FOR REFERENCE

1. Monetary Economics-M.L.Seth
2. Monetary Theory - M.C.Baish
3. Introduction to Money, Exchange & Banking - Raj Narain Mathur
4. Monetary Theory - H.L. Bhatia
5. Monetary Economics-Deva Irakkam

SEMESTER – III
Allied - II – Sociology
RURAL SOCIOLOGY

Unit : I : Rural Sociology

Definition. Nature. Scope. Aims. Characteristics of rural society. Origin of rural sociology in India. Importance of rural sociology in India.

Unit - II : Agrarian Structure

Land tenure patterns : Zamindari system and Rayatwari system. Present land tenure pattern and land distribution. Village community: Definition. Features and Types. Sociological Importance of Village Communities in India.

Unit - III : Rural Economy Structure

Features of rural economy. Importance of Rural economy. Problems of Indian agriculture. Landless agriculture laborers: Their problems. Government measures to protect and uplift them. Impact of Green Revolution. Cottage Industries: Handicrafts. Machine crafts. Importance of cottage industries in Indian economy.

Unit - IV : Rural Power Structure

Traditional power structure: Traditional village panchayat, Caste panchayat: Its composition and functions. Modern statutory panchayat: Its organization, functions and problems. Changes brought about by it. Emerging pattern of leadership.

Unit - V : Rural Development

Community Development Programme: Meaning. Aims & Objectives. Implementation and Achievement. Evaluation of the Community Development Programme.

Meaning and Main components of Rural Development. Aspects of Rural Development. Important Rural Development Programmes: IRDP, NREP, TRYSEM, ANTYODYA, RLEGP, JRY, SFDA, FFWP, DDP, DPAP, EAS, JGSY, SGSY, PMRY.

BOOKS FOR REFERENCE

1. Deasi, A.R. **Rural Sociology in India**. Bombay: Popular Prakashan, 1969.
2. Chitamber, J.B., **Introductory Rural Sociology**, New York: John Wiley & Sons, 1973
3. Beteille, Andre, **Studies in Agrarian Structure**. New Delhi: Oxford University press, 1974.
4. Desai, Vasant., **Rural Development**. 6.vols. Bombay: Himalaya publishing House, 1986.
5. Sharma R.K. **Rural Sociology**, New Delhi: Atatlantic Publishers & distributors, 2004.

SEMESTER - III

Allied - Political Science

MODERN POLITICAL THOUGHT

Unit - I

- ❖ Sovereignty - Thomas Hobbes - John Locke - Political Philosophy of Rousseau - Montesquieu - David Hume - Edmund Burke.

Unit - II

- ❖ Utilitarianism - Jeremy Bentham - James Mill - John Stuart Mill - Idealist Theory of the State - Bradley - Bosanquet - Immanuel Kant. - Individualism - Herbert Spencer.

Unit - III

- ❖ Socialism - Definition - Kinds of Socialism - Christian Socialism - Collectivism - Fabianism - Guild Socialism - Marxism - Karl Marx - Communism - Lenin.

Unit - IV

- ❖ Democracy - Definition of Democracy - Liberalism - Nationalism - Internationalism - Imperialism - Fascism - Nazism.

Unit - V

- ❖ Pluralism - Harold J.Laski - Bertrand Russel - Indian Political Thought - Mahatma Gandhi.

BOOKS FOR REFERENCE

1. Suresh Chandra Pant : History of Western Political Thought
2. Mahajan. V.D. : Recent Political Thought
3. Sharma .U : Western Political Thought
4. Sharma. U. : Modern Indian Political Thought
5. Sachdeva & Gupta : A Simple Study of Political Thought

SEMESTER III
SKILL - BASED SUBJECT
HISTORY OF PATHFINDERS OF TAMILNADU (1680 – 1975 A.D)

UNIT I

Historic background of the Resurgence in Tamilnadu - In Multi – Spheres since 17th Century – Political, Socio, Religious and cultural spheres – Social and Religious awakening.

UNIT II

Rettaimalai Srinivasan – Rajaji – M.C. Raja – Thillaiyadi Valliammai – Viswanatha Das - K.B. Sundarambal.

UNIT III

Ayya Vaikundar – Ramalinga Adigal – Pandithar Ayodhy Das – Ida Scudder- Pasumpon Muthuramalinga Thevar – E. V. Ramasamy – Kamarajar – Arcot Brothers – Seethakadhi.

UNIT IV

Umarupulavar – G. Subramaniya Iyer – Bharathiyar as a Journalist – V.O. Chidambaram as a Literary Laureate – Pudumaipithan – Rukmini Arundel – Pattukottai Kalyana Sundaram – Justice M.M. Ismail.

UNIT V

Dr. Muthulakshmi Reddi – C.V. Raman – Srinivasa Ramanujar – G.D. Naidu – A.P.J. Abdul Kalam – K. Kasthuri Rangan.

BOOKS FOR REFERENCE:

1. Paramarthalingam, C. *Religion and Social reform in Tamilnadu*, Madurai, 1997.
2. Pillai, K.K. *Tamilaga Varalaru, Makkalum Panpadum*, Chennai, 2004.
3. Rajayyan, K. *History of Tamilnadu (1585-1982)*, Madurai, 1982.
4. Viswanathan, E. *The Political career of E.V.R.* Madurai, 1983.
5. Sivagnanam, M.P. *Viduthalaiporil Tamilagam (Tamil) Vol. I & II*, Chennai, 2005.

SEMESTER – III

SKILL BASED SUBJECT

“PANCHAYAT RAJ IN INDIA WITH A REFERENCE TO TAMIL NADU”

UNIT I

Concept of Panchayat Raj – Evolution – Ancient Times – Guilds, Sabha, Samiti and Kudavolai System under Cholas – Gramika, Gopa, Sthanika, Panchamandala – Little Republics.

UNIT II

Development under British rule – Need context – Phases 1687 – 1881 – Lord Mayo and Lord Ripon – 1907 Royal Commission on Decentralization – Provincial Autonomy under the Act of 1935 – Post Independence – Article 40 in the Constitution.

UNIT III

Panchayat Raj and Mahatma Gandhi – Gram Swaraj of Vinoba – Evolving 73rd Constitutional Amendment Bill, 1991 – Phases 1957 – 1992 – Committees on Panchayat Raj – Balwantrai Mehta Committee – Ashok Mehta Committee – L.M. Singhvi Committee.

UNIT IV

The 73rd Constitutional Amendment Act, 1992 – Definition and Provisions – Reservation of Seats – Gramsabha Meetings – Participatory Rural Development (PRD) – Financial Resources and Management – Community Development programmes – Jawahar Yojana, IRDP and Mahatma Gandhi National Rural Employment Guarantee Scheme.

UNIT V

Panchayat Raj System in Tamilnadu – Emergence of Corporation at Madras (1683) and other Municipalities – Two – tier System under Kamaraj – Tamilnadu Panchayat Act, 1994, - Direct election to the Village Panchayats.

BOOKS FOR REFERENCE:

- Sachdheva and Durga, *Simple study of Local self Government in India.*
- S.R. Maheswari and Sri Ram Maheswari, *Local Government in India.*
- Kumar Kalanand Mani (ED) *Panchayat Raj OR Gram Sarkar.*
- “Status of Panchayat Raj in the States and Union Territories of India, 2000” – *Published by Institute of Social Science, New Delhi, 2000.*

SEMESTER - III

Non-Major Elective

FREEDOM MOVEMENT IN INDIA

Unit - I

- ❖ Rise of Indian Nationalism - Birth of Indian National Congress - Aims - Surat Split - Moderate Nationalism - Militant Nationalism - Muslim League - Home Rule Movement.

Unit - II

- ❖ Gandhian Era - Rowlatt Satyagraha of 1919 - Non-Co-operation Movement - Boycotts - Chauri Chaura incident - The Swarajya Party.

Unit - III

- ❖ Simon Commission Report - Nehru Report - Muslim Reaction - Jinnah's 14 points - Poorna Swaraj Resolution.

Unit - IV

- ❖ Civil Disobedience Movement - Salt Satyagraha - Gandhi - Irvin Pact - Round Table Conference - Communal Award - Poona Pact - Cripp's Mission - Failure.

Unit - V

- ❖ Quit India Movement - Resolution - Arrest of Leaders - Mass Movements - Failure - Indian National Army - Wavell Plan - Cabinet Mission Plan - Mountbatten Plan - Independence Act of 1947.

BOOKS FOR REFERENCE

1. V.D Mahajan : Modern India
2. Majumdar R.C : Advanced History of Modern India
3. P.E. Roberts : History of British India
4. Sumit Sarkar : Modern India
5. R.C. Agarwal : Constitutional Development of India and Freedom Movement

SEMESTER – III
Non - Major Elective
GANDHIAN THOUGHT (TRUTH AND NON-VIOLENCE)

Unit - I

- ❖ **Truth** - Its Meanings - Evolution of Truth - Truth and World Religion - Truth and Great Thinkers and Philosophers.

Unit - II

- ❖ **Gandhian Conception of Truth** - God is Truth and Truth is God - Experiments in Truth - Absolute Truth and Relative Truth - Realization of Truth and Educating the People (Conscientization) - Truth and Non-Violence.

Unit - III

- ❖ **Non-Violence** - Its Meaning and the Conceptual Frame work.

Unit - IV

- ❖ **Non-Violence and World Religion** - Non-Violence and Great Thinkers and Philosophers - Non-Violence and its application.

Unit - V

- ❖ **Theories of Non-Violence** - Types of Non-Violence - Inaction, Violent Action and Non-Violent Actions - Passive Resistance - Non-Violent Direct Action - Satyagraha - Non-Violent or Non-Existence.

BOOKS FOR REFERENCE

1. Gandhi, M.K., Non-violence in War & Peace, 2 vols. Navajeevan Publications, Ahmadabad.
2. Horsburg, H.J.N., Non-violence and Aggression.
3. Kantilal Shah, Vinoba on Gandhi, Ch.9 & 10.
4. Mahadevan, T.K., Truth and Non-violence, Gandhi Peace Foundation, Delhi.
5. Richard B. Gregg, The Power of Non-violence, Navajeevan Publications, Ahmadabad
6. Theo P. Lentz, Towards a Science of Peace.
7. Yogendra Singh, Traditions of Non-violence.

SEMESTER - IV

Core Subject

HISTORY OF INDIA (1772 A.D. - 1947 A.D.)

- Unit – I** : Lord Warren Hastings – Reforms – Impeachment – Lord Cornwallis – Reforms – Permanent Revenue Settlement – Lord Wellesley – The subsidiary alliance – Conquests – Anglo – Marathawars – Lord Hastings – Lord William Bentinck – Reforms – Ranjit Singh – Anglo Sikh Wars.
- Unit – II** : Lord Dalhousie – Reforms – Doctrine of Lapse – Annexations – Sepoy mutiny of 1857 – Nature, causes and results – Lord Canning – Lord Lytton – Lord Ripon – Lord Ripon – Lord Curzon – partition of Bengal.
- Unit – III** : Constitutional development – Regulating Act of 1773 – The Act of 1861 – The Act of 1892 – Minto Morley Reforms Act of 1909 – Montagu Chelmsford Reforms, Act of 1919 – Government India Act of 1935.
- Unit – IV** : Socio – Religious reform movements – Development of Education – Growth of local self government – Impact of British rule in India – Anti-caste movements Vaikkam movement – Legacy of British rule.
- Unit – V** : Emergency of Nationalism – Indian National Congress Indian National Leaders : Dadabai Naoroji – Surendranatt Banerji – Gokhale – Thilak – Anne Besant – Mahatma Gandhi – Jawaharlal Nehru.

Book for Reference:

- 1) Mahajan, V.D : India since 1526
- 2) Roberts, P.E : History of British India
- 3) Majumdar, R.C : An advanced History of India
- 4) Sumit Sarkar : Modern India
- 5) Sathianathair : History of India
- 6) Dharmaraj : History of India, 1761-1947 (Tamil)
- 7) Rai Choudri, S.C : History of Modern India
- 8) Grovet, B.L : A new look on Modern Indian History

SEMESTER – IV
Skill - Based Subject
PRINCIPLES AND METHODS OF ARCHAEOLOGY

Unit - I

- ❖ **Definition and Scope:** Archaeology and Allied Subjects - Kinds of Archaeology : Underwater Archaeology - Aerial Archaeology - Salvage Archaeology - Value of Archaeology: as a Primary Source - Resource of Historical Relics - Understanding our Heritage.

Unit - II

- ❖ **History of Archaeology in India:** Sir William Jones - James Princep - Alexander Cunningham - Robert Bruce Foote - Lord Curzon - John Marshall - Mortimer Wheeler - Post-Independence Era.

Unit - III

- ❖ **Surface Exploration:** Map Reading - Historical Literature - Local Tradition - Aerial Photography - Scientific Aids in Exploration.
- ❖ **Excavation:** Trial Trench - Rectangular Trenching System - Horizontal Excavation Open Stripping - Quadrant Method.

Unit - IV

- ❖ **Dating Methods:** Radio - Carbon Dating - Thermoluminescence Dating - Dendrochronology:
- ❖ **Documentation and Preservation:** Pottery yard - Photographic Documentation - Register - - Excavation Report - Conservation of Artifacts - Wood, Glass, Metal Objects - Museum Display.

Unit - V

- ❖ **Indian Archaeological Sites :** Harappa - Mohanjo-daro - Nalanda - Dwaraka - Adichanallur - Arikamedu - Kaviripumpattinam.

BOOKS FOR REFERENCE

1. Childe U.G. : A Short Introduction to Archaeology.
2. David Browne : Principles and Practice in Modern Archaeology.
3. Ekambaranathan.A : Archaeological Excavation Techniques
4. Mahalingan. T.V : Excavation in Lower Cauveri Basin.
5. Rajan .K : Archaeology - Principles and Methods.
6. Raman K.V. : Principles and Methods of Archaeology.
7. Sankalia H.D. : New Archaeology - The Scope and Application in India
8. Venkatraman .R : Indian Archaeology - A Review.

SEMESTER - IV
Skill - Based Subject
EPIGRAPHY

Unit - I

- ❖ Introduction - Importance of Epigraphy - Origin and Growth - Kinds of Inscriptions - Literary, Political, Religious, Memorial, Legal, Welfare, Social Status and Spurious - Contents and Conventions.

Unit - II

- ❖ Evolution of Scripts - Paleography - Pictographic - Ideographic - Phonograph - Logograph - Cuneiform - Graffiti - Linear - Brahmi - Vatteluthu - Grantha - Writing materials - Decipherment.

Unit - III

- ❖ Dating System - Eras - Saka Era - Kali Era - Vikrama Era - Kollam Era - Estempaging of Inscriptions.

Unit - IV

- ❖ Eminent Epigraphists - George Buhler - J.F.Fleet - James Burgess - H.Krishna Sastri - V.Venkaya - B.L. Rice - Robert Sewell - E.Hultzeh - K.V. Subramaniya Iyer.

Unit - V

- ❖ Inscriptions - Case Studies - Velivikkudi Grant - Uttaramerur Inscription - Kuram Copper Plates - Kanyakumari Inscriptions.

BOOKS FOR REFERENCE

1. Subramanian, T.N. : South Indian Temple Inscriptions
2. Sadasiva Pandaratar. T.V. : Pirkala Cholar Varalaru
3. Sircar, D.C. : Indian Epigraphy
4. Dikshidar, V.R.R. : Select South Indian Inscriptions.

SEMESTER – IV
Allied - Subject II – Economic
PUBLIC FINANCE

Unit - I : Introduction

Meaning of Private Finance and Public Finance - Principle of Maximum Social Advantage - Public Expenditure - Classification - Cannons - Causes for the Recent Growth of Public Expenditure with Special Reference to India.

Unit - II : Public Revenue

Meaning and Sources of Revenue - Cannons of Taxation - Objectives of Taxation - Kinds of Taxation: Direct and Indirect Taxes - Proportional, Progressive, Regressive and Degressive Taxation - Specific and Advalorem Duties.

Unit - III : Public Debt

Meaning - Objectives and Classification of Public Debt - Effects - Burden of Public Debt - Methods of Debt Redemption - India's Public Debt since Independence.

Unit - IV : Budgeting

Meaning and Principles of Budgeting - Objectives - Characteristics of a Sound Budget - Budgetary Procedure in India a) Preparation, Presentation and Discussion b) A Review of the Latest Union Budget.

Unit - V : Deficit Financing

Meaning, Objectives and Limitations - Instruments of Fiscal Policy - Fiscal Policy and Economic Development of India.

BOOKS FOR REFERENCES

- | | | |
|--|---|---------------------|
| 1. Public Finance | : | B.P. Thyagi |
| 2. Public finance | : | Andley and Sundaram |
| 3. Public finance | : | Mathur and Saxena |
| 4. Public finance | : | Dalton |
| 5. Public finance in Theory and Practice | : | S.K. Singh |
| 6. Public finance in Theory and Practice | : | Holley Ulbrich. |

SEMESTER - IV
Allied - II - Sociology
CONTEMPORARY SOCIAL PROBLEMS

Unit - I : Social Problem

Definition. General Characteristics. Causes. Types. Process of development of a social problem. Society's response to a social problem. Perspectives : Social Disorganization Perspective. Value - Conflict Perspective.

Unit - II : Drug and Alcoholism

Drug Abuse : Definition. Classification. Extent of the Problem. Causes. Social implications of drug abuse. Measures to treat and prevent drug abuse.

Alcoholism : Meaning. Extent of the Problem. Causes and Effects. Measures to treat and prevent alcoholism.

Unit - III : Child Labour

Definition. Causes. Effects of the Problem. Legal Measures to eradicate the problem. Child Labour Eradication Programmes in India.

Unit - IV : Aids

Meaning. Extent of the problem. Modes of transmission. Its stages of development. Its impact on the affected individual, family and society. Protective and preventive measures.

Unit - V : Terrorism

Concept. Characteristics. Theoretical (Relative Deprivation Theory) Explanation for Terrorism. Legal Measures for combating the problem.

BOOKS FOR REFERENCE

1. Julin, Joseph, **Social Problem**, New Jersey: Printice-Hall, Englewood Cliffs, 1977.
2. Scarpitti, Franx.R., and Andersohn, Margaret. L. **Social Problems**, New York : Harper Row, 1989.
3. Merton, Rober K., and Nisbet, Robert. **A Contemporary Social Problems**. New York: Harccurt Brace, 1991.
4. Lamert, Edwin M. **Social Pathology**, New York: McGraw-hill Book Company, 1991.
5. Ahuja, Ram., **Social Problems in India**, Jaipur: Rawat Publications, 1992.

SEMESTER – IV
Allied II - Political Science
INDIAN ADMINISTRATIVE SYSTEM

Unit - I : Introduction

Characteristics of Indian Administration during Colonial Rule - Constitution - Contemporary Administrative Context.

Unit - II : Central Government - I

Framework - Secretariat - Ministry of Home Affairs - Ministry of Finance - Ministry of Defence - Ministry of External Affairs - Planning Commission and National Development Council - Constitutional Authorities :

Central Government - II

All India Service - Indian Administrative Service - Central Civil Services - Training for Civil Servants - O & M in Central Government - Union-State Relationship - Administrative Reforms.

Unit - III : The Election Commission - Attorney General of India - Special Officers for the SC's and ST's; Special Officers for Linguistic minorities - The Finance Commission - Advisory Committees - Administration of Public Undertakings.

Unit - IV : State and Local Government

State Secretariat - Board of Revenue - District Administration - State Services - Rural and Urban Local Government - Panchayat Raj and the Ashok Mehta Committee - The 73rd & 74th Constitutional Amendments.

Unit - V : Issues in Indian Administration

Generalists and Specialists — Minister-Civil Servant Relationship — Administrative Corruption and Administrative Accountability.

BOOKS FOR REFERENCE

1. Shriram Maheswari, **Indian Administration** (New Delhi : Orient Longman, 1993 4th Edition).
2. Avasthi & Maheswari, **Public Administration** (Agra : Lakshminarain Agarwal, 1995) 21st Edition.
3. T.N. Chaturvedi, **Organization of Government of India** (New Delhi : IIPA, 1985).
4. S.R.Maheswari, **The Administrative Reforms Commission** (New Delhi : Atmaram, 1982).
5. D.P.Singh, **Problems of Public Administration in India** (Delhi : Chand & Co., 1980).

SEMESTER - IV

Non - Major Elective

SOCIAL REFORMERS OF MODERN INDIA

Unit - I

- ❖ Rajaram Mohan Rai - Dayanand Saraswathi - Sir Syed Ahmed Khan

Unit - II

- ❖ Jothiba Phule - Dr. Ambedkar - Pandit Aythyadas

Unit - III

- ❖ Ranade - Dadabai Nauroji - R.C. Dutt.

Unit - IV

- ❖ Ramalingar - Vaikuntasamy - Narayana Guru - Ayyankali - Swami Sahajananda

Unit - V

- ❖ Periyar E.V.R - Vinoba Bhave - Jayaprakash Narayan.

BOOKS FOR REFERENCE

1. B.Sobhanan, Temple Entry Movement and the Sivakasi Riots, Madurai, 1985.
2. Dr.R.Ponnu, Sri Vaikuntaswamigal and the Struggle for Social Equality in South India, Ram Publishers, Madurai, 2000.
3. T.P.Kamalanathan, Scheduled castes struggle for Emancipation in South India, Tirupattur, 1985.
4. V.R.Krishna Ayyar, Social Democracy and Dalit Egalite, University of Madras, 1989.
5. Dr.P.Mohan, Scheduled caste: History of Elevation in Tamilnadu, 1900 - 1955, New Era Publication, 1993.
6. B.S.Chandrababu, Social Protest and its impact in Tamil Nadu with respect to Self Respect Movement, 1920 - 1940, Madras, 1993.
7. K.R.Hanumantan, Untouchability - A Historical study upto 1500 A.D., Madras, 1972.
8. Guru, Nataraja, P.Life and Teaching of Narayanaguru, Ernakulam, 1968.
9. M.S.A., Rao, Social Movements or Social Transformation, Madras, 1979.
10. kh.ngh.rptQhdk;> ts;syhh; fz;l xUikg;ghL.
11. f.Kfpyd;> lhf;lh; gp.Mh;. mk;Ngj;fhh; tho;f;if tuyhW.
12. tp.rPdpthrd;> jPz;lhikiaj; jPapL> kq;ifg; gjpg;gfk;> rpjk;guk;> 2004.
13. tp.rPdpthrd;> Mjppuhtplh; Gdh;tho;Tk; jtj;jpU Rthkp> rf[he;jhTk;> rpjk;guk;> 2001.

SEMESTER – IV
Non - Major Elective
INDIAN CONSTITUTION

Unit - I

- ❖ Framing of the Indian Constitution - Salient Features of the Indian Constitution - Preamble.

Unit - II

- ❖ Fundamental Rights and Fundamental Duties - Directive Principles of State Policy - Amendments.

Unit - III

- ❖ The Executive: President - Vice-President - Prime Minister. The State Government: Governor and Chief Minister.

Unit - IV

- ❖ The Legislature: Lok Sabha - The Speaker. Rajya Sabha: The Process of Law - Making.

Unit - V

- ❖ The Judiciary - The Supreme Court and High Courts - Judicial Review.

BOOKS FOR REFERENCE

1. Sharma M.P : The Government of Indian Republic
2. Kapur Anup chand : Select Constitutions
3. Gokhale B.K. : Political Science
4. Dubey .S.N. : World Constitutions
5. Kapur A.C. : Constitutional History of India.

Semester V

Core Subject

HISTORY OF TAMILNADU – UPTO 1565 AD

Unit I

Geographical features of Tamil Nadu – Society – Sangam Age – Political, Social, Economic and Religious conditions – Kalabhras.

Unit II

Origin of the Pallavas – Mahendravarman I – Narasimhavarman I – Contributions of Pallavas to Art and Architecture – Pallava Administration.

Unit III

Imperial Cholas – Paranthaka I – Rajaraja I – Rajendra I – Chalukya Cholas – Kulottungan I, Kulottungan III – Chola administration – Contribution to Literature – Art and Architecture.

Unit IV

First Pandyan Empire – Battle of Thirupurambiam – Second Pandyan Empire – Contribution of Pandyas to Art and Architecture.

Unit V

Invasion of Malik Kafur – Rise of Madurai Sultanate – Impact of Muslim Rule – Tamil Nadu under Vijayanagar Empire – Administration, Art and Literature – Battle of Talaikota – Decline of Vijayanagar Empire.

Books for Reference :

Social History of Tamils	-	Pillai. K.K.
History of the Pallavas of Kanchi	-	Gopalan. R.
The Tamils 1800 years ago	-	Kanakasabhai Pillai
History of Tamil Nadu upto 1336	-	Subramanian. N
History of the Tamils	-	Srinivasa Iyengar P.T.
History of South India	-	Nilakanta Sastri K.A.

Semester V

Core Subject

HISTORY OF EUROPE – 1453 A.D. TO 1789 A.D.

Unit I

The Survey of the condition of Europe at the close of the middle ages - Fall of Constantinople, 1453 A.D. – The Geographical Discoveries – Causes – Effects – Renaissance – causes – Effects on Literature, Art and Science.

Unit II

Reformation movement – Martin Luther and Calvin – Zwingli – Anglicanism - Counter Reformation – Revival of Catholicism – Results of the Reformation.

Unit III

Emergence of Nation States – Rise of Spain – Ferdinand – Isabella – Charles V – Philip II – Foreign Policy – Armada - Dutch War of Independence.

Unit IV

Rise of Bourbon Dynasty – Henry IV – Sully – Richelieu – Cardinal Mazarin - Thirty year's war – causes – course – Results - significance.

Unit V

The Enlightened Despots – Louis XIV – Peter the Great – Catherine II - Frederick the Great – Maria Theresa – Joseph II.

Books for Reference :

- | | | |
|--------------------------------|---|--------------------|
| History of Europe 1450 to 1815 | - | Rao. B.V |
| Modern Europe upto 1945 | - | Verma. S.P |
| History of Europe 1453 – 1789 | - | Arun Bhattacharjee |

Semester V

Major Elective

History of World Civilizations upto 1453 A.D

Unit I

Civilization – Definition – Causes for the growth of Civilization – Palaeolithic Age – Neolithic Age – Age of Metals – Egyptian Civilization – Sources – Salient Features – Mesopotamian Civilization.

Unit II

Hebrew Civilization – Ancient Persian Civilization – Phoenician Civilization – Greek Civilization – Age of Pericles – Legacy of Greece – Roman Civilization – Legacy in the field of Law, Philosophy – Art and architecture – Chinese Civilization – Salient Features

Unit III

Rise and Growth of Major religions – Hinduism – Confucianism – Zoroastrianism – Christianity – Islam.

Unit IV

Byzantine Civilization – Code of Justinian Social and Economic Condition – Art – religion and philosophy – Arabian Civilization – Salient features.

Unit V

The Church and the States – Monastic Orders – The Crusades – Feudalism – Guild System – Rise of Cities and Universities.

Books for Reference

- 1) S.E. Swaine – The World Civilization
- 2) Wall Bank Tayler - History of World Civilizations
- 3) W. Watson - Early Civilization in China
- 4) Arnold Toynbee - A Study of History
- 5) Will Durct - A Study of Civilization
- 6) H.A.L. Fisher - A History of Europe, Vol. I

Semester V
Major Elective
FREEDOM MOVEMENT IN INDIA SINCE 1801 A.D

- Unit – I** : Early movements – South Indian Rebellion 1800 – 1801 – Vellore mutiny of 1806 – The Revolt of 1857 – Causes, Course and results – Tribal and peasant movements.
- Unit – II** : Causes for the rise of Indian Nationalism – Birth of Indian National Congress – Moderates and Extremists – Partition of Bengal and Swadesi movement – Terrorists – Muslim league – Home rule movement.
- Unit – III** : Gandhian era – Rowlatt Satyagraha of 1919 – Khilafat movement – Non Co-operation movement – 1920 – 1922 – The Swarajya party – Simon Commission – Nehru report and Jinnah’s Fourteen points.
- Unit – IV** : Civil disobedience movement, 1930 – 1934 – Salt Satyagraha – Gandhi Irwin pact – Round table conferences – Communal award – Poona pact – Cripp’s mission – Quit India movement – Muslim league and demand for Pakistan – Indian National Army.
- Unit – V** : Towards transfer of power – Wavell plan – Cabinet Mission plan, 1946 – Mountbatten plan – Indian Independence Act of 1947 – Role of Tamilnadu in the Freedom movement – Role of press and cinema in the Freedom Movement – Leaders – V.O. Chidambaram Pillai – Bharathy, Subramania Siva, Vanchinathan – Rajaji – Kamaraj.

Book for Reference :

- 1) R.C. Agarwall : National movement and constitutional development in India.
- 2) D.C. Gupta : Indian National movement.
- 3) M.M. Ahulwalia : Freedom struggle in India, 1857-1909.
- 4) R.C. Majumdar : History of Freedom movement in India, Vol. 1 to 3
- 5) K. Rajayyan : Freedom struggle in India.
- 6) J. Dharmaraj : History of Freedom struggle in India (Tamil)
- 7) G. Venkatesan : History of Freedom struggle in India.

Semester V
Major Elective
History of the Far East (1839 – 1970 A.D)

Unit I

Early European Contacts – First Opium War – Taiping Rebellion – Second Opium War – First Sino – Japanese War – Open Door Policy – Hundred Days Reforms – Boxer Rebellion – Empress Dowager – Manchu Reforms.

Unit II

Rebellion of 1911 – Sun – yat – Sen Yuan – Slih – Kai – China and the First World War – 21 demands – May 4th Movement – Manchurian – Crisis.

Unit III

Chiang Kai Sheik – The Kuomintang and the Communists – China and the Second World War – The Civil War and the Long March – The Communist Revolution of 1949 – Mao TSc – Tung – Foreign Policy of China since 1949.

Unit IV

The opening of Japan – Meiji restoration – Meiji Constitution – Anglo – Japanese alliance – Russo – Japanese War – Second Sino – Japanese War.

Unit V

Japan and the First World War – Japan and the Second World War – Foreign Policy of Japan Since 1950

Book for Reference

1. Harold M. Vinacke – A History of the Far East in Modern Times
2. Clyde and Beers – The Far East
3. Gupta R.S. – A History of Modern China

Semester VI
Core Subject
HISTORY OF TAMILNADU – 1565 A.D. to 2000 A.D.

Unit I

Nayaks of Madurai – Viswanatha Nayak – Thirumalai Nayak – Chockanatha Nayak – Rani Mangammal – Nayaks of Tanjore – Raganatha Nayak – Vijaya Ragava Nayak – Nayaks of Gingi – Krishnappa II – Contribution of the Nayaks to administration, art and architecture.

Unit II

Sethupathy of Ramnad – Kizhavan Sethupathy – Maratha Rule in Tanjore – Venkoji – Shaji – Serfoji II – Contribution to Art and Architecture.

Unit III

Advent of the British and the French – Carnatic Wars – Mysore wars..

Unit IV

Polygars – Kattabomman – Maruthu Pandyan – South Indian Rebellion – Vellore Mutiny – Impact of British Rule – Ryotwari System.

Unit V

Growth of Education and Press - Justice Party – E.V.Ramasamy and Self Respect Movement – V.O.Chidambaram – C. Subramania Bharathy – Vanchi – Subramania Siva Rajaji – Administration of Kamaraj, C. N. Annathurai, M.G. Ramachandran, M. Karunanithi and J. Jeyalalitha.

Books for Reference:

History of Tamil Nadu	-	Rajayyan. K
History of Tamil Nadu	-	Krishnamurti. V.M
Social History of Tamils	-	Pillai. K.K.
History of Tamil Nadu	-	Chellam. V.T
History of the Nayaks of Madurai	-	Sathiananthaier. R
History of Tamil Nadu Vol II	-	Subramanian. N

Semester VI

Core Subject

HISTORY OF EUROPE – 1789 A.D. TO 1945 A.D.

Unit I

Europe on the eve of the French Revolution- French Revolution – Causes – course – results – Napoleon Bonaparte – Campaigns – Domestic Reforms – The Congress of Vienna - Concert of Europe – The Revolutions of 1830 and 1848 – Metternich – Napoleon III – Domestic Policy and Foreign Policy.

Unit II

Unification of Italy – Unification of Germany – Bismarck’s Domestic and Foreign Policy - Franco Prussian War 1871 - Policy of Kaiser William II - Eastern Question – The Greek war of Independence – Crimean war – Congress of Berlin and Balkan wars.

Unit III

Europe on the eve of First World War – First World War – Causes – course and results – Peace of Paris – Peace of Versailles - League of Nations – Russian Revolution, 1917.

Unit IV

Facism in Italy – Mussolini – Foreign Policy - Nazism in Germany – Hitler- Foreign Policy – Turkey Under Mustafa Kamal Pasha.

Unit V

Rome – Berlin – Tokyo Axis – Second World War - causes, course and results - Potsdam conference – U.N.O – Origin – Achievements

Books for Reference :

History of Europe	-	V.D. Mahajan
History of Europe	-	South Gate
History of Europe	-	Kettleby
History of Europe 1789A.D. - 1945 A.D.	-	Arun Bhattacharje

Semester VI

Core Subject

History of Science and Technology since 1500 A.D

Unit-I

Modern era-Impact of Renaissance-on -science and Technology. Nicholas Copernicus-Kepler-Galileo-Toricelli. Rene Descartus-Immanuel kant- Issac Newton-Francis Bacon.

Unit-II

Industrial Revolution-Cotton Mining- Metallurgy -Agrarian Revolution –Plough-Horticulture-Transportation and communication – Discoveries of Henry Cavandish-Joseph Priestely-Lavoisier.

Unit III

Communicative Skills- Telegraph -Telephone- Television - Progress Of Biology- Charles Darwin- Progress in Physics and Mathematics-Michael Faraday- James Clark Maxwell- Progres in Chemistry- John Dalton-Mandeleef -Alfred Nobel –Rontgen- X-Ray-Marie Curie – and Radium- Marconi and Radio .

Unit- IV

Nuclear Space Research- Newtonian Impact – Meteorological Studies- Space Shuttles-Rockets –Albert Einstein- Theory Of Darwin-Rutherford.

Unit-V

Modern Science in India- Pioneers of Indian Science and Technology-Jagadish Chandra Bose-P.Chandra Roy- Srinivasa Ramanujam-C.V.Raman-Harhobind Hharona- Abdul Kalam- Kasthuri Rangan.

Books for reference:

- 1.Vargheese Jeyaraj, “History of Science and Technology”.
- 2.Venkat Raman, “History of Science and Technology”.
- 3.Sinjar, “ A Short History of Science”.
- 4.Charles Van Daren, “History of Knowledge – The Pivot Event”
- 5.Charles Van Daren, “ People and Achievements of World History”.

Semester VI

Core Subject

WORKING OF THE INDIAN CONSTITUTION

Unit I:

Historical Background – Growth of Legislature from 1861 to 1892 – Minto – Marley Reforms of 1909 – Montague Chelms Ford Reforms Act 1919.

Unit II

The Government of India Act 1935 – The Indian Independence Act, 1947 – Framing of the Indian Constitution – Outstanding features of the constitution.

Unit III

Federal System – Government of the Union – the President – Prime Minister and the Council of Ministers – Constitution of Parliament – Functions of Parliament Legislative Procedure – Ordinary Bills – Money Bills – Financial Bill.

Unit IV

Government of the States – Chief Minister and the Council of Ministers – Special Status of Jammu and Kashmir.

Unit V

Organisation of Judiciary – The Supreme Court Appointment of Judges – High Courts – Judicial Review – Fundamental Rights – Amendment of the Constitution.

Books for Reference

1. Durga Das Basu - Introduction to the Constitutions of India
2. Gran Ville Austin - The Indian Constitution Corner Stone of a Nation
3. Santhanam - Union – State Relation in India
4. A.C. Kapur - Constitutional History of India
5. A.V. Pylee - Constitutional History of India
6. A.B. Keith - Constitutional History of India

Semester VI

Major Elective

Constitutional History of England (1603 – 1970 A.D)

Unit I

Stuart Period – James I and his Parliaments – Struggle between Charles I and the Parliament – The petition of Rights – The eleven years tyranny – The Long Parliament – The Civil War – Causes – Course – Consequences.

Unit II

The Common Wealth – The Constitutional experiments of Oliver Cromwell – The significance of his experiments – the end of the Common Wealth – Restoration – Charles II – James II Glorious revolution of 1688 – Causes – Course – Results – The Bill of Rights – The Act of Settlement.

Unit III

George I and George II – Whig Oligarchy - Emergence of the office of the Prime Minister – Walpole - Origin and development of Cabinet System – George III – his Personal Government – Causes of failure.

Unit IV:

The Age of Reforms – The Parliamentary Reforms Act of 1832 – Relation between the two houses of Parliament – The Parliament Act of 1911 – The Representation of Peoples Act of 1918 and 1928 – Reduction of Voting Age in 1970 – The Chartist Movement – Characteristics – Significance.

Unit V

Constitutional Changes due to the two World Wars – War Cabinet – The Statute of West Minister – The abdication of Edward VIII – The Constitutional Significance – Recent Development in the Political and Constitutional Institution such as (i) Judiciary (ii) The Local Government (iii) The Commonwealth of Nations

Book for Reference

1. L.N. Srivastava - Constitutional History of England
2. Prof. Gultti - History of England since 1760
3. Warner and Martin - Political Constitutional History of England

Semester VI

Major Elective

International Relations (1945- 2000 A.D)

Unit I

UNO – Origin and establishment – structure – functions – specialized agencies – achievements – Common Wealth – Non-alignment.

Unit II

The concept of cold war – various phases of Cold War – NATO, SEATO, CENTO, WARSAW PACT – Truman Doctrine – Marshall Plan – Korean War – Vietnam war-Cuban crisis- German Question –effects of Cold War.

Unit III

International Law – Disarmament – Disarmament under Security System – NPT – CTBT – Nuclear Power for Peace – SAARC.

Unit IV

Middle East Problem – Palestine question – Arab – Israel War – Palestine Problem – Oil Diplomacy – Gulf War - European Atomic Energy Community (EURATOM).

Unit V

European Common Market – European Union (EU) Common Wealth of Nations – Foreign Policy of U.S.A, Russia and India - Disarmament of USSR – Afghan War.

Books for Reference

- 1) Gibbons – An Introduction To World Politics
- 2) Palmer and Perkins – International Relations
- 3) W. Schuman – International Politics
- 4) Arnold Joseph Toynbee – Survey of International Affairs.
- 5) M. G. Gupta – International Relations Volume I

Semester VI

Major Elective

HISTORY OF RUSSIA (1800-1991A.D)

Unit –I

- Alexander I – Reforms and Achievements. Nicholas I –
Decembrist Revolt – His reforms – Crimean war.

Unit –II

- Alexander II the Liberator – His reforms and External Policy.
Alexander III – Internal and External Policies.

Unit –III

- Nicholas II – the decline of monarchy – the Russo – Japanese
war – the Revolution of 1905 – Political parties –
October Manifesto – the Dumas and Stolypin – Russia and the
first
World War – Bolshevik Revolution- Civil War in Russia.

Unit –IV

- The Constitution of 1924 – Lenin and his New
Economic
Policy. Joseph Stalin- His reforms – The Constitution of 1936
–
USSR and the Second World War.

Unit –V

- Krushchev – Internal and External policies – Breshnew –
his
Internal and External Policies – progress in Russia
–
Gorbachev - Dismemberment of Soviet Russia.

BOOKS FOR REFERENCE

1. Thaden Edward – Russia since 1801
2. N. Subramanian – History of Russia
3. Basi – A History of Russia
4. Wadhvani – Rise of Soviet Union to world
Power.

APPENDIX - AZ32

Manonmaniam Sundaranar University, Tirunelveli
Choice Based Credit System
B.A. Tourism & Hospitality Management
SYLLABUS FOR III & IV SEMESTER

Semester III			
Sl. no	Subject	Hours	Credit
1	<i>Part I</i> Tamil/ other languages (1 course)	6	3
2	<i>Part II</i> English (1 course)	6	3
3	<i>Part III</i> <i>Core Subject:</i> Travel Geography	6	5
4	<i>Allied: (Any one)</i> 1. Front Office Operation 2. Principles of Management 3. Art and Architecture in India (South India)	6	5
5	<i>Part IV</i> <i>Skill Based :</i> 1. Computer Applications to Tourism 2. Food & Beverage Services	4	4
6	<i>Non Major Elective :</i> 1. Introduction to Tourism 2. Office Administration	2	2
Total		30	22

Semester IV			
Sl. no	Subject	Hours	Credit
1	<i>Part I</i> Tamil/ other languages (1 course)	6	3
2	<i>Part II</i> English (1 course)	6	3
3	<i>Part III</i> Core Subject: Tourism Marketing	6	5
4	<i>Allied: (Any one)</i> 1. Public Relation and Advertising 2. Organizational Behaviour 3. Art and Architecture in India (North India)	6	5
5	<i>Part IV</i> <i>Skill Based :</i> 1. Communicative French 2. Communicative Hindi	4	4
6	<i>Non Major Elective :</i> 1. Housekeeping Operations 2. Travel Agency & Tour Operations	2	2
7	<i>Part V</i> Extension Activities : NCC, NSS, YRC/YWF		1
Total		30	23

Semester V			
Sl. no	Subject	Hours	Credit
1	<i>Part III</i> <i>Core Subjects</i> 1. International Airline Management	7	5
	2. Tourism Product of India	7	5
2	<i>Major Elective: (Any One)</i> 1. Travel Agency Management Or Eco Tourism	6	5
	2. Economics of Tourism Or Hotel Accounting	6	5
3	<i>Skill Based Subject:</i> Common	4	4
Total		30	24

Semester VI			
Sl. no	Subject	Hours	Credit
1	<i>Part III</i> <i>Core Subjects</i> 1. Air Travel, Ticketing and Fare Construction	6	5
	2. Human Resource Management in Tourism	6	5
	3. House Keeping Management	6	5
	4. Air Cargo Operation Management	6	5
2	<i>Major Elective: (Any One)</i> 1. Tourism Accounting Or Tourism Policy & Planning	6	5
Total		30	25

B.A. TOURISM & HOSPITALITY MANAGEMENT

SYLLABUS FOR III & IV SEMESTER

**Semester III
Core Subject
Travel Geography**

Unit – I

Geographical features, location, physiography, metrology etc. – topography and geology-natural vegetation – population and human development – drainage.

Unit- II

Geography of tourism: Overview- world's continents – longitude and Gratitude of map reading skills – Exploring the countries of the world and cities.

Unit- III

Natural tourist resources – land forms & terrains – tourist destinations – water bodies – hill af mountain resorts – sanctuaries – monuments, historical and archaeological sites, museum and art galleries etc.

Unit – IV

Development of Tourism in India with special reference to geography – Impact Assessment – approaches, methodology and techniques

Unit – V

World time zones – Elapsed travel times – international date line

Books for Reference:

- | | |
|------------------|--|
| 1. Bhatia A.K. | - Tourism Development, Principles and Practices |
| 2. Dubey & Negi | - Economic Geographic |
| 3. Jagmohan Negi | - Tourism Guide and Tour Operation : Planning and Organizing |

**Semester III
Allied -1**

FRONT OFFICE OPERATION

UNIT-I INTRODUCTION TO HOTEL & CATERING INDUSTRY

- Evolution of Hotel Industry in India & Abroad.
- Growth and development of Hotels in India.
- Inter relationship between Travel, Tourism and Hospitality
- Role of Travel Agents and Airlines
- Types of Hotels, Lodging – Ownership, affiliation & management contracts
- Classifying hotels and levels of service

UNIT-II ORGANISATIONAL CHART OF HOTELS

- Hotel Organisational chart of small, medium and large hotels
- Hierarchy chart of front office department of small, medium and large hotel
- Role & functions of front office
- Guest Cycle
- F.O. co-ordination with other departments
- Job description and job specification with examples

UNIT – III

RESERVATION SECTION

- Reservation/ prearrival phase & Guest Cycle
- Importance and definition of reservation
- Sources and modes of Reservation.
- Systems of reservations – Manual and Automated
- Processing a reservation – Booking, blocking, availability, confirmation and storage of information
- Processing reservation – FIT, Group
- Amendment and cancellation
- Types of reservation – guaranteed, non-guaranteed
- Over booking policy

UNIT- IV POST REGISTRATION ACTIVITIES

- Rooming & handling C-forms.
- Travel agents voucher.
- Luggage handling.
- Amenities and special arrangements.

UNIT- V LAYOUT & EQUIPMENT

- Layout of the front office.
- F.O. Equipments

Books for Reference :

1. Front Office Operation by Colin Dix & Chirs Baird
2. Front Office Training Manual by Sudhir Andrew
3. Principles of Hotel Front Office Operations, Sue Baker & Jeremy Huyton, Continum
4. Front Office Procedures, Social Skills and Management, Peter Abott & Sue Lewry Butterworth Heinemann

Semester III
Allied- 2
Principles of Management

UNIT - 1 : HISTORICAL DEVELOPMENT

Definition of Management - Science or Art - Management and Administration - Development of Management Thought - Contribution of Taylor and Fayol - Functions of Management - Types of Business Organisation.

UNIT - 2 : PLANNING

Nature & Purpose - Steps involved in Planning - Objectives - Setting Objectives - Process of Managing by Objectives - Strategies, Policies & Planning Premises- Forecasting - Decision-making.

UNIT - 3 : ORGANISING

Nature and Purpose - Formal and informal organization - Organization Chart - Structure and Process - Departmentation by difference strategies - Line and Staff authority - Benefits and Limitations - De-Centralization and Delegation of Authority - Staffing - Selection Process - Techniques - HRD - Managerial Effectiveness.

UNIT - 4 : DIRECTING

Scope - Human Factors - Creativity and Innovation - Harmonizing Objectives - Leadership - Types of Leadership Motivation - Hierarchy of needs - Motivation theories - Motivational Techniques - Job Enrichment - Communication - Process of Communication - Barriers and Breakdown - Effective Communication - Electronic media in Communication.

UNIT - 5 : CONTROLLING

System and process of Controlling - Requirements for effective control - The Budget as Control Technique - Information Technology in Controlling - Use of computers in handling the information - Productivity - Problems and Management - Control of Overall Performance - Direct and Preventive Control - Reporting - The Global Environment - Globalization and Liberalization - International Management and Global theory of Management.

Books for Reference:

1. Harold Koontz & Heinz Weihrich "Essentials of Management", Tata McGraw-Hill, 1998
2. Joseph L Massie "Essentials of Management", Prentice Hall of India, (Pearson) Fourth Edition, 2003.
3. Tripathy PC And Reddy PN, " Principles of Management", Tata McGraw-Hill, 1999.
4. Decenzo David, Robbin Stephen A, "Personnel and Human Resources Management", Prentice Hall of India, 1996
5. JAF Stomer, Freeman R. E and Daniel R Gilbert Management, Pearson Education, Sixth Edition, 2004.
6. Fraidoon Mazda, "Engineering Management", Addison Wesley, -2000.

Semester III

Allied- 3

Art and Architecture in India (South India)

Unit – I

Excavations - Arikamedu And Adichanailur - Artifacts - Seals And Pottery - Metal Art And Coins.

Unit –II

Andhra - Amaravathi- Nagarjuna Konda, Chalukya - Durga & Ladkhan Temple At Aihole, Cave Temple At Badami, Virupaksha At Pattadakal, Rashtrakuta - Ellora Temples- Hoysalas Chennakesava Temples.

Unit II

Pallavas- Mahabalipuram- Kailasanatha Temple- Pandyas Cave Temple ,Cholas Brahadeshwara, Gangaikonda Cholapuram, Dharasuram Temple- Vijayanagar - Virupaksha & Vitalaswami Temple, Hampi

Unit IV Sculptures- Mahabalipuram- Ellora, Belur & Halabid- Bronzes of South India.

Unit V

Paintings- Kanchipuram, Sittanavasal, Thaniavur- Lepakshi. Music - Carnatic- Dances- Bharathanatyam, Kuchipudia, Mohiniattam, Kathak- Bagavathamela.

Books for Reference:

1. Percy Brown : Indian Architecture Buddhist and Hindu Architecture - Volume I and II
2. K.A. Mahalingam : A History South India.
- 3 T.V. Mahalingam : Early Pandya Architecture
4. C.V. Narayana Iyer : Origin and History of Saivism

SEMESTER III
Skill Based - 1
Computer Applications to Tourism

Unit-1

- Introduction to computers: what is computer, block diagram, components of a computer system, generation of computers, programming languages, generation of languages, storage devices, floppy disks, CDROM'S.

Unit-II

- Operating systems: introduction, functions, types, components, case studies-DOS, windows.

Unit-III

- Word processing, spread sheets and presentations: what is word processing, features of MS WORD, editing commands and mail merge-what is spread sheet, features, formulae and functions, if statement, preparing sample worksheets, different graphs.

Unit-IV

- Features of POWERPOINT-preparing a presentation-preparing an organization chart

Unit-V

- Introduction to internet: what is internet, network, network of networks, WWW.e-mail, websites, introduction to e-commerce -introduction to tournet-feature of tournet-feature of tour manager:costing-evaluation of cancellation.

Books for Reference

- 1.Fundamental of Computer, V.Rajaram,Prentice Hall India.
- 2.Mastering Micro Office,Lonnie E.Mosely&David M.Boody,BPB Publications.

SEMESTER III
Skill Based Subject -2
Food & Beverage Services

Unit – I

Introduction to the Food & Beverage industry – Types of catering establishments – Introduction of Food & Beverage Operations.

Unit – II

F & B services areas in a hotel: Restaurant Coffee Shop, room Service, Bars, Banquets, Discotheques, Still Room, Grill Room, Snack Bar, Executive lunches, centres & Night Clubs.

Unit – III

F & B service equipment : usage of equipment, criteria for selection, requirements, quantity and types – furniture – linen – Chinaware, silverware & Glassware- disposables.

Unit – IV

Food & Beverage Service Personnel – Job descriptions & Job Specifications of F&B Service staff – attitude & Attributes of a Food & Beverage personnel, competencies – Basic Etiquettes for Catering staff – Interdepartmental relationships.

Unit – V

F &S Service Methods : Table Service-silver/ English, family, American, Butler/French, Russian – Self Service – Buffet & Cafeteria – specialized service – Guerdon , tray, Trolley, Lounge – Room, etc.

Books for Reference

1. Food & Beverage service Training Manual - Sudhir Andrews, Tata McGraw Hill
2. Food & Beverage Service - Lillicrap & Cousins, ELBS
3. Modern Restaurant Service- John Fuiler, Hutchinson
4. Professional Food & Beverage Service Management- Brain Varghese

SEMESTER III

Non Major Elective 1

Introduction to Tourism

Unit-I

Historical evaluation and development of tourism - Murphy's factors on the evolution of tourism – Paid holidays and transition to modern tourism.

Unit-II

Tourism Phenomenon: Concepts, forms and types and nature – Future trends – Purpose of tourism

Unit-III

Tourism system – Basic concepts and Impacts: Introduction, concepts of pull and push – Demand and supply – Motivations and factors for travel – Measurements of tourism and statistics – Economic, social, physical and environment impacts of tourism.

Unit-IV

Travel formalities and procedures – arrival formalities – departure formalities – Travel and tourism terminology – air, ship and rail travel – hotel terminology, general terms – tourism abbreviations – steamship code abbreviation

Unit-V

Growth and Development of Tourism in India – Tourism Committees – pre and post – Independence periods National Committee on tourism – National Action Plan and Policies for Civil Aviation and Tourism.

Books for Reference:

Bhatia A.K. : Tourism Development – Principles and practices National Action Plan 1992.

Burhat and Medlit : Tourism – Past, Present and Future

Raul. R.H. : Dynamics of Tourism

Christopher J.Holloway : The Business of Tourism Macdonald and Evans 1983.

Selvaraj .C. : Principles of Tourism.

SEMESTER III

Non Major Elective 2

Office Administration

Unit-I

Meaning of office – Importance of an office – Functions of an office – meaning of office administration – office manager – functions.

Unit-II

Office layout – objectives – importance – principles of office layout – open office – private office. Office furniture – need for standardized furniture – selection of furniture – types of furniture.

Unit-III

Filing – Functions – significance – Advantages. methods of classification of files – filing system and equipments. Indexing.

Unit-IV

Office forms – kinds – Forms control – Objectives of forms control – forms designing – principles of form designing continuous stationary supplies.

Unit-V

Office mechanization – objects – need for office machanisation – office automation – selection of office machines – types of machines.

Books for Reference:

1. Office organization and Management - R.K.Chopra
2. Office Management and commercial correspondence – Balraj Digga

SEMESTER IV
Core subject
Tourism Marketing

Unit-I

Definition-market segmentation-marketing in tourism-marketing mix-tourism product.

Unit-II

Advertising-purpose in tourism-planning for advertising-production of advertisement-display of posters-media-travel writing.

Unit-III

Display and sale in tourism market-conference,conventions and exhibition services-distribution channels for tourists supply-characteristics of tourist product distribution-distributive functions.

Unit-IV

Sales forecasting-techniques-factors-methods-forecasting tourism products-carrying capacity analysis.

Unit-V

Marketing communication-Public Relation-Personality-Marketing Research-types-Organisation-Marketing Research in Tourism-sources of data for research in tourism.

Books for reference:

- 1.Manish Srivatsava - National and State Tourism Marketing
- 2.Jha S.M - Tourism Marketing
- 3.Beri G.C - Marketing Research

SEMESTER-IV

Allied - 1

Public Relation and Advertising

Unit-I

Principles of public relations & communication-Definition-Nature-Functions-Role of public relations in marketing-sales-Exhibition and Fairs-Definition of communications- Tools and media of public relations concepts and classifications. Classification of newspaper Visual communication-Media Relation-Public Relations and Writings.

Unit-II

Corporate Public Relations-Emerging Corporate India-PR Challenges-challenges of the public relations changing business environment-Media Relations-Employees Relations

Unit-III

Editing & Production of Publications-Corporate-Scope-Type-Editing techniques of PR-Photography-Graphics and Colour-Good Layout-Proof Reading.

Unit-IV

Advertising Theory & Practice-Advertising Theory-Types & Classification-Planning and Managing Advertising Campaigns-Creating Audio&Visuals Advertising media.

Unit-V

The Role of Public Relations in Promoting Tourism-Need for PR department in Tourism-PR functions & Role in Tourism-PR as an effective marketing Tour PR and publicity in Tourism.

Books for reference:

1. Bernecker Paul- Methods of Media of Tourist Publicity, Austrian National Tourist office 1961.
2. Hollow JC- the Business of Tourism, Pitman London 1980.
3. Jenkins IR & Jif JJ. Planning the Advertising Campaign, Macmillan Publishing 1973.
4. Morrison J.W- Travel Macmillan Publishing 1973.
5. Morrison J.W- Travel Agents & Tourism Acro Publishing Inc. New York 1980.
6. Schmoll G.M- Tourism Promotion. Tourism International Press London 1977.
7. Van Harsell- Tourism in exploration, Prentice Hall 1970.
8. S.A. Chunawalla & K.C. Sethia- Foundations of Advertising- Theory and Practice, Himalaya Phb 2002.

SEMESTER 1V
Allied-2
Organizational Behaviour

Unit – I

Importance and scope of organizational psychology – Individual difference – intelligence tests – Measurement of intelligence – personality tests – nature, types and uses.

Unit – II

Perception – Factors affecting perception – Motivation – theories – financial and non-financial motivation – techniques of motivation – transactional Analysis – Brain storming.

Unit – III

Job satisfaction – meaning- factors- theories – management of job satisfaction- morale – importance – Employee attitude and behavior and their significance to employee productivity – job enrichment – enlargement

Unit – IV

Group Dynamics – Cohesiveness – Co-operation – competition – conflict – types of conflict – resolution of conflict – socio metry – group norms – role – position – status – supervision style – training for supervisions.

Unit – V

Leadership – types – theories – leadership and evaluation – organizational climate – organizational effectiveness – organizational development – counseling and guidance – Importance of counselor – types of counseling – information needed for counseling.

Books for Reference:

- | | |
|-----------------|----------------------------|
| 1. Keith Davis | - Human Behaviour at work |
| 2. Ghos | - Industrial Psychology |
| 3. Fred Luthans | - Organizational Behaviour |
| 4. L.M Prasad | - Organizational Behaviour |
| 5. Hippo | - organizational Behaviour |

SEMESTER 1V
Allied-3

ART AND ARCHITECTURE IN INDIA (NORTH INDIA)

Unit-I

Indus Valley Civilization - seals - pottery. Architecture- sculpture - painting - minor art.

Unit – II

Mauryan Architecture - Asoka's contribution - foreign influence

Mauryan sculpture - Bull and Lion capitals - Buddhist Architecture - Sarnath pillar – Sanchi stupa, Chaitya at Kane - Viharas at Nasik and Ajanta

Unit - III

Evolution of Temple Architecture - Gupta period - Sanchi - Deogarh.

Unit – IV

Indo Islamic Architecture - Qutb Minar- Fatehpur sikri - Taj mahal - Redfort

Unit - V

Painting - Ajantha - Miniature paintings of Mughals, Rajasthani, Pahari,

Music - Hindustani, Carnatic - Dances - Kathakali Odessy, Manipuri, Kathak, Bharatnatyam, Mohini attam and Kuchipudi , Folklore dances .

Books for reference:

1. Percy brown – Indian Architecture [Hindu and Buddhists] Volume I &II
2. Basham A.L -The wonder that was India

Semester IV

Skilled Based Subject -1

COMMUNICATIVE FRENCH

Unit I

Comprises of basic grammar elements / usual forms of greeting / enquires.

Unit II

At the Airport – Welcoming the Foreigner – Conducting him to the Hotel – Guide Services.

Unit III

At the Hotel – Checking in – Changing Money – Restaurant – Bar Sightseeing.

Unit IV

Tourists Sports of South India

Unit V

Shopping

Reference for Books:

1. A Votre Service 1 Franc,ais pour l'hotellrie elle toursme – Rajeswari Chandra Sekar, Chitra Krishnan, etal
2. Le Franc, ais de l'hotelleir et du tourisme – M.Dany, J.R. Laloy & Jayanthi Balan

SEMESTER IV
Skill Based Subjects -2

Communicative Hindi

Unit-I

Starts with alphabets, word construction sentence formations with applied grammar, numerals, functional Hindi, names of flowers, relations vegetables, parts of conversational Hindi.

Unit-II

Conversation in day-to-day life, between two friends, teacher, students, market places, shops, enquires in bus stand, railway airport, about current affairs, sports and in college.

Unit-III

Some phrases proverbs and idioms also will be practiced. Creative Writing and Reading.

Unit-IV

Essays connection with temples, festivals of India, important incidents and simple stories.

Translation

Unit - V

10-15 sentences in English to Hindi and Hindi to English.

Books for reference:

1. Anuvadmalā Part – 1, Dakshin Bharat Hindi Prachar Sabha , Chennai – 17
2. Manohar Kahaniyam , Dakshin Bharat Hindi Prachar Sabha , Chennai -17.
3. Gadhya Sankam, Dakshin Bharat Hindi Prachar Sabha, Chennai – 17.
4. Tamil Nadu, Veera Raghavan, Publication Division, Ministry of Information and Broadcasting, Patiala House, New Delhi.
5. Temples of India: Myths and Legends , Mathuram Bhoothalingam, Ministry of Information and Broadcasting.

SEMESTER IV

Non Major Elective 1

HOUSE KEEPING OPERATIONS

Unit –I

INTRODUCTION TO HOUSEKEEPING DEPARTMENT - ROLE OF HOUSEKEEPING IN HOSPITALITY INDUSTRY - CLASSIFICATION OF HOTEL - CLASSIFICATION OF ROOMS - LAYOUT OF HOUSEKEEPING DEPARTMENT

UNIT - II

ORGANIZATION OF A HOUSEKEEPING DEPARTMENT - JOB DESCRIPTION OF

HOUSEKEEPING PERSONNEL - DEPARTMENT THAT HOUSEKEEPING COORDINATES WITH QUALITIES OF HOUSEKEEPING STAFF

UNIT - III

CLASSIFICATION OF CLEANING EQUIPMENT - MANUAL MECHANICAL – SELECTION CRITERIA OF EQUIPMENT - CLEANING AGENT - SELECTION CRITERIA OF CLEANING AGENT

UNIT - IV

CLASSIFICATION OF CLEANING AGENT (ALKALIS, ACIDS, SOLVENTS, ABRASIVES - DEODORIZING, DISINFECTANT, DISTRIBUTION AND CONTROL) - MAIDS SERVICE ROOM

UNIT - V

LAYOUT AND ESSENTIAL FEATURES - ORGANIZING MAID`S TROLLEY

Books for Reference:

1. Hotel Housekeeping, Sudhir Andrews, Tata McGraw Hill
2. The Professional Housekeeper, Trucker Scheneider, VNR
3. Housekeeping Management for Hotels, Rosemary Hurst, Heinemann
4. Accommodation & Cleaning Services, Vol. I & II, Davide Allen, Hutchinson

SEMESTER IV

Non Major Elective 2

Travel Agency & Tour operations

Unit-I

Travel agency, definitions and its scope – Definition of a tour operator and their functions – History of Travel agency and present status of travel agency system in India & abroad.

Unit-II

Procedure for approval of a travel agency and tour operator to sell tourism pertaining to Travel agency and tour operator. Organisation & structure of a travel agency and tour operation.

Unit-III

Ticketing, Itinerary preparation & Marketing of tourism products or packages by travel agency & tour operator. Linkages & arrangements of a travel agency , tour operator with hotels, airlines and other transport agencies.

Unit-IV

The need for professionalization & the job training for a travel agency & tour operator.

Unit - V

Management of private & public airlines in India, Case studies of Sahara, Jet etc.

Books for reference:

1. A.K Bhatia - Tourism development , principles & practices
2. VTC Middleton - Marketing in travel & tourism , Hein man publications
3. JMS & Nagi - Tourism & Hoteliering , Gethanjali publications
4. Michael Hall C - Tourism planning, Policies, Processes & Relationships, Pearson Education Ltd.
5. Javid Akhbar - Tourism Management in India , Ashish, New Delhi 1990.

Semester V
Core Subject - 1

International Airlines Management

Unit I:

History, growth and development of aviation industry. Aviation in India, present status of airline companies, airports, airport security etc.

Unit II:

Role of IATA and its function, ICAO its role and function, DGCA, Airport Authority of India, Open sky policy, International conventions ; Warsaw convention, Chicago convention 1944.

Unit III:

Management of Airlines – Types of airlines, airlines personnel and revenue earning, airport management, study of aircraft parts, the aircraft turnaround, the control tower.

Unit - IV

Airport facilities and special passengers, airport access, check in facilities, landing facilities for departing passengers, in-flight services, cabin component, audio and video projection equipment, emergency equipment for disembarkation, in-flight entertainment, classes of service with more comfort.

Unit - V

Baggage – Definition & rules – free baggage allowance – special charged – prohibited items.

Books for Reference:

1. Jagmohan Negi, 'Air travel Ticketing and Fare construction', Kanishka, New Delhi, 2005
2. OAG, Consultant, IATA, Geneva
3. Air Tariff Book
4. Stephen Shaw, 'Airlines in Shifts & Mgt', Ashgate Pub, USA, 2004
5. IATA, Geneva
6. R. Doganis, 'Airport Business'
7. K. Sikdar, All you wanted to know about airlines functions
8. Journal of Air Transport Management by Elsevier Science
9. Joel Lech, 'Airfare secrets exposed', Powell Books, London, 2002

Semester V
Core Subject - 2

Tourism Product of India

Unit I:

Tourism Products: Definition, Concept and classification. Cultural Heritage of India - Stages of evolution, continuity. Heritage – Meaning, types, of Heritage Tourism, Heritage Management Organisations- UNESCO, ASI, ICOMOS, INTACH.

Unit II:

Architectural Heritage of India : glimpses on the prominent architecture style flourished in different period. Different style of architecture in India - Hindu, Buddhist and Islamic. Selected case studies of World Heritage Sites in India

Unit III :

Pilgrimage Destinations: Hindu- Charo Dham Yatra, Jyotirlinga Yatra, Devi Yatra Vindhya (U.P.) Kamakhya (Assam), Vaishnavadevi, Kashi, Prayag, Gaya, Ayodhya, Mathura– Vrindavana, Allahabad, Ujjain, Hardwar, Gangasagar. Pallani Murugan Temple (TN), Tirupathi (AP) Sabarimalai (Kerala). Buddhist: Lumbini, Bodhgaya, Sarnath, Kushinagar, Vaishali, Rajgriha, Kapilvastu, Jain: Kashi, Pavapuri, Shatrunjaya, Girnar, Mt. Abu, Sharavanbelgola, Palitana Muslim: Ajmer Sharif, Nizamuddin (Delhi), Sikh: Amritsar, Christian: Annai Velankani.

Unit IV:

Natural Resources: Important Wildlife Sanctuaries, National Parks and Natural Reserves in India. Hill Stations: Study of Hill Station attractions and their environs with case studies of Mussoorie, Nainital, Munnar, Kodaikanal and Ooty. Beaches and Islands: Beaches in Goa, Kerala, Tamilnadu, Andaman Nicobar & Lakshadweep islands.

Unit V:

Important Museum, Art Galleries and Libraries. Performing art of India: classical dances, folk dances and folk culture.

Fairs and Festivals : Social, religious and commercial fairs of touristic significance.

Books for References:

1. Basham A. L. : The Wonder that Was India.
2. Basham A. L. : Cultural History of India
3. Peroy Brown : Islamic Architecture
4. Peroy Brown : Indian Architecture
5. James Burgess : Western Cave Temples of India
6. Enakshi Bhavnani : Dances of India
7. R. Nath : Mughal Colour Decoration
8. Husaini S. A. : The National Culture of India, National Book Trust, New Delhi
9. Gupta M. L. and Sharma D. D. : Indian Society and Culture

Semester V
Major Elective – 1 (Any one)

Travel Agency Management

Unit I:

Definition of Travel Agency and Tour Operations, differentiation, interrelationship. Origin and growth of travel agencies. An overview of the travel agents in India, local travel agents.

Unit II :

How to set up travel agency:

- (a) Market research, sources of funding
- (b) Comparative study of various types of organisation proprietorship, partnership, private limited and limited
- (c) Govt. rules for getting approval
- (d) IATA rules, regulation for accreditation
- (e) Documentation
- (f) Office automation
- (g) Practical exercise in setting up a Travel Agency

Unit III:

Departmentalization, managerial responsibilities and use of technology.
Sources of earning : commissions, service charges etc. Itinerary preparation, important considerations for preparing itinerary, costing, types and components of package tour.

Unit IV:

Dealing with Principal Suppliers: Dealing with air travel, tourist transport and accommodation. Supplier challenges. Present business trends and future prospects problems and issues.

Unit V:

Publicity and promotion: Issues related to sales, promotional issues, marketing communication, public relations. Associations and Organizations promoting travel agencies and tour operators: IATO, TAAI, ASTA, WATA, PATA, FHRAI, UFTA

Books for Reference:

1. Travel Agency and Tour Operation, Concepts and Principles - J.M.S. Negi
2. Professional Travel Agency Management - Chunk, James, Dexter & Boberg
3. The Business of Travel Agency Operations and Management - D.L. Foster
4. Travel Agency Management-An Introductory Text, Anmol Publication New Delhi-Mohinder Chand.
5. Tourist Guide and Tour Operations, Kanishka Publication, New Delhi.

OR

Semester V
Major Elective – 1

Eco Tourism

Unit I:

Environmental Studies : Definitions, components of environment, types of environment (an overview of food chains, food web and energy flow). Bio – Geo Chemical cycles,

Unit II:

Environmental Pollution – Air, Water and Noise Pollution with special reference to tourism activities. Green house effect. Depletion of ozone layer treats due to global warming.

Unit III:

Concept and Origin : Emergence of Eco-tourism, growth and development. Definitions. Principles of Eco-tourism. An overview of Eco-tourists.

Unit IV:

Eco-tourism Resources in India – Caves, National Parks, Wild life sanctuaries, Tiger Reserves, Biosphere Reserves, Wet lands, Mangroves, Coral reefs and desert Ecosystem.

Unit V:

Eco-tourism Planning and development strategies – Eco-tourism strategies with special reference to Environmental Protection (Environmental Impact Analysis)
Role of Eco tourism in WTO, UNDP, UNEP, Ministry of Tourism GOI - Eco tourism in Tamil nadu.

Books for Reference

1. Baldwin J.H. (1985) Environmental Planning and Management. I.B.D. Dehradun
2. Singh Ratandeep : Handbook of Environmental Guidelines for Indian Tourism – Kanishka Publishers, New Delhi.
3. Romila Chawla : Wildlife Tourism and Development; Sonali Publications, New Delhi.
4. Dash M.C. (1993) fundamentals of Ecology (New Delhi), Tata McGraw Hill Co.Ltd., Publishing Co.Ltd.)
5. Kormandy E.J. (1989) Environmental issues Concerns and Strategies (New Delhi) Ashish
6. Kandari O. P., Chandra Ashish : Tourism Biodiversity & Sustainable

Development, Isha Books, Delhi.

Semester V
Major Elective – 2 (Any one)

Economics of Tourism

Unit I:

Nature, scope and application of economics in tourism and hospitality; Tourism scenario in India – tourist arrival data and Indian economy

Unit II:

Law of Demand, Determinants of Demand; Elasticity of Demand; Nature of tourism demand analysis and its forecasting; Law of supply; Determinants of tourism and hospitality supply; Elasticity of supply analysis and forecasting

Unit III:

Liberalization, privatization, globalization and tourism
Input-Output decisions, Production function, short-run analysis; Long-run function; short run and long-run cost functions. Empirical estimation of production and costs

Unit IV:

Price-Output Decisions; Tourism and hospitality market structures; Price determination under different market conditions; Pricing practices and strategies; Profit measurement and profit policy; Determinants of investment decision in tourism and hospitality

Unit V:

Tourism development and economic planning, review of the economic planning of tourism through the annual and five year plans, foreign exchange earnings and contribution to GDP through tourism.

Books for reference:

1. Hailstones, Thomas J. and Rathwell, John C., Managerial Economics, Prentice Hall International, New Delhi.
2. Chopra, O.P., Managerial Economics, Tata-McGraw Hill, New Delhi.
3. Agarwal, Manju, Economics for decision Making, Indian Institute of Finance, 1997, Delhi.
4. Davis, J.R. and Chang, Simon, Principles of Managerial Economics, Prentice Hall International, New Delhi.
1. Mehta, P.L., Managerial Economics, Sultan Chand, New Delhi.
2. Petterson: Managerial Economics, 3rd Ed., Prentice Hall of India, Delhi.
3. Adhikary M., Managerial Economics, Khosla Pub.
4. Salvatore, Domnick, Managerial Economics in a global economy, Irwin McGraw Hill.
5. Tribe, J. 2001, The Economics of Leisure and Tourism, New Delhi, Butterworth – Heineman.
6. Cullen, P. 1997, Economics for Hospitality Management, London, International Thomson Business Press.
7. Sinclair, M.T. and Stabler, M., 1997, The Economics of Tourism, London, Routledge

OR

Semester V
Major Elective – 2

Hotel Accounting

Unit - I

INTRODUCTION TO ACCOUNTING: Meaning and Definition - Types and Classification - Principles of accounting - Systems of accounting - Generally Accepted Accounting Principles (GAAP) – departmental income & expense statement (all schedules including long – form)

Unit – II

Departmental accounting : Meaning and purpose, methods allocation and apportionment of expenses.

Unit – III

Understanding Balance sheet statement: Meaning and purpose, assets and liabilities, identification of assets and liabilities.

Unit – IV

Visitors Tabular Ledger : Meaning & purpose, very basic of audit, night audit in hotels.

Unit – V

Costing: Fundamentals, marginal costing technique, basic standard costing techniques, standard for material & labour variance only.

Books for Reference :

Hotel Accounting, Earnest B. Horwath & Luis Toth
Hospitality Accountig, Richard Kotas & Michael Conlan
Hotel & Catering Costing & Budgets, R.D Boardman, Heinemann

Semester VI
Core Subject – 1
Air Travel, Ticketing and Fare Construction

Unit – I

Air travel and world airlines – air transport regulations – passenger aircraft and aeroplanes – airlines policies and practices.

Unit – II

World side city-to-city schedules- Familiarization with OAG: letter city and airport code, airline designated code, minimum connecting time, global indicator – air transport abbreviation and meaning. Familiarization with Air tariff : currency regulation, NUC conversion factors, general rules, planning itinerary by air.

Unit – III

Introduction to fare construction: Elements of air fares – types of fares – far sheets- Abbreviation used in the fare formula.

Unit – IV

Air far construction : Guidelines - mileage principles, fare construction with Extra Mileage Allowance (EMA), Extra Mileage Surcharge.

Unit – V

Air Ticketing techniques : Reservation Sheets – Airline Reservations – Domestic Airline ticketing – International Airline Tickets. Universal air travel plan: types of air travel card. Bank Settlement Plan (BSP)- Case studies of selected Airlines Modules.

Books for Reference:

1. Jagmohan Negi, 'Air travel Ticketing and Fare construction', Kanishka, New Delhi, 2005
2. OAG, Consultant, IATA, Geneva
3. Air Tariff Book
4. Stephen Shaw, 'Airlines in Shifts & Mgt', Ashgate Pub, USA, 2004
5. IATA, Geneva
6. R. Doganis, 'Airport Business'
7. K. Sikdar, All you wanted to know about airlines functions
8. Journal of Air Transport Management by Elsevier Science
9. Joel Lech, 'Airfare secrets exposed', Powell Books, London, 2002

Semester VI
Core Subject – 2

Human Resource Management in Tourism

Unit I:

Basic Philosophy and Approaches in HRD Planning. HRD Functions

Unit II:

Human Resource Management (HRM) in Perspective: HRM: The Field and It's Environment.
The Evolving Role of HRM in the tourism industry: the Changing Emphasis

Unit III:

Meeting Human Resource Requirements: Human Resource Planning (HRP). Job/Role Analysis.
Recruitment & Selection. Orientation & Placement.

Unit IV:

Developing Effectiveness in Human Resources: Training & Development (T&D). Performance
Management. Potential Appraisal. Career/Succession Planning.

Unit V :

Managing Employee Growth: Conflict and Stress management. Importance of Discipline and
Counseling in Tourism. Human Resource Management in Tourism: HRM in the service Industry.
Emerging trends and Perspectives

Books for Reference:

1. Ian Beardwell & Len Holden– Human Resource Management: A contemporary
1. perspective, Macmillan
2. Wayne F. Cascio – Managing Human Resources: Productivity, Quality of
Work Life,
3. Profits, Tata Mcgraw Hill
4. M. Madhukar - Human Resource Management in Tourism , R. Publications

Semester VI
Core Subject – 3

House Keeping Management

Unit - 1

Introduction to House Keeping: Importance & Functions of Housekeeping House Keeping Areas – Front-of-the-house and Back-of-the-house areas, Guest Rooms, Public Areas, Maids Room, Indoor and Outdoor Areas. Co-ordination with other Departments like Front Office, Engineering, F & B, Kitchen, Security, Purchase, HRD, Accounts.

Unit - II

Layout of House Keeping Department : Sections of the housekeeping department, their functions and layout. Organization of Housekeeping Department : Hierarchy in large, medium & small hotels - Attributes of staff. Job Descriptions and Job Specifications

Unit – III

Guest Rooms: Types - Amenities & facilities for Standard & VIP guest rooms.

Unit - IV

Cleaning Equipments : Classification, use, care & maintenance
Selection & purchase criteria. Cleaning Agents: Classification, use, care and storage - Distribution & Control - Selection Criteria

Unit - V

Key Control : Computerized keys - Manual keys - Key Control Procedures Glossary of Terms:
Students should be familiar with the glossary of terms pertaining to above mentioned topics

REFERENCE BOOKS: -

1. Housekeeping Training Manual - Sudhir Andrews
2. Hotel, Hostel & Hospital Housekeeping – Brenscon & Lanox

Semester VI
Core Subject – 4
Air Cargo Management

Unit – I

Introduction to Cargo Management: Cargo history, concepts and common terms used in cargo handling, rules governing acceptance of Cargo. Cargo rating- familiarization of cargo tariffs. Round off of the weights/dimensions/currencies. Chargeable weight rating – specific commodity rates, class rates, general cargo rates, valuation charges.

Unit – II

Introduction to Air Cargo: Air Cargo Terminology – IATA cargo agent and agency operation – ABC air cargo Guide book – TACT rules, TACT tariff etc. – Chargeable weights & Principles of Air cargo.

Unit – III

Cargo booking acceptance : Acceptance of special cargo. IATA dangerous goods regulation. Perishable cargo, valuable cargo, baggage shipped as cargo, human remains. Life saving drugs, live animal regulations. Restrictions in acceptance of cargo. Identification of cargo, documentation, labels.

Unit - IV

Documents in Air Cargo : Airway bill: The function and completion of the airway bills, labeling & marking of packages. Cargo manifest, Cargo transfer Manifesto : Documents concerning postal mails and diplomatic mails. Shippers declaration for dangerous goods. SMTP, IGM, SOB, LOC, FCL.

Unit – V

Cargo Handling : Handling Cargo. Cargo capacity of Air – cargo needing special attention. Instruction to dangerous goods regulations – Cargo liability & Insurance. – foreign Trade License activity - Export – Import Documentation.

Books for Reference:

Course Material on Air Cargo Management, Swastick School for travel and Tourist Studies

Air Cargo Management Manual

Semester VI
Major Elective (Any one)

Tourism Accounting

Unit – I

Accounting Principles: Concepts and Conventions, double entry system – journal – ledger – trial balance and its preparations – final accounts of proprietary partnership and joint stock companies of tourism industry – insurance claims.

Unit – II

Analysis and interpretation of financial statement – ratio Analysis – fund floor (operating ratios in tourism industry)

Unit – III

Costing accounting – concepts – classification of costs – preparation of cost sheet- Methods of costing operation costing (canteen costing)

Unit – IV

CVP – Analysis – Break Even Point, Break Even Chart – application of CVP analysis for managerial decisions.

Unit - V

Pricing – Importance – pricing in tourism – conventional pricing methods – determination of room rates – food and beverage pricing – menu engineering – pricing package tours and budgeting and budgetary control.

Books for Reference :

Richard Kotas, Management Accounting for Hospitality and Tourism

OR

**Semester VI
Major Elective
Tourism Policy and Planning**

Unit – I

Tourism Planning – phases – needs – goals – planning process – role of government in tourism

Unit – II

Tourism Planning in India - five year plans – tourism policy Considerations and structure planning – safety and security of tourists.

Unit – III

Tourism policy formulation – public sector involvement – role of public sector and planning – legislation and regulation establishing tourism policy – Manila Declaration – Goa declaration.

Unit – IV

Origin and development of tourism policy in India – Tamilnadu. Types of planning – local, regional, national and master plan – National Action plan of 1992 – National Tourism Policy of 2002.

Unit – V

Incentives and subsidies of state and central government to promote tourism – national committee for tourism.

Books for Reference :

- | | |
|-------------|---|
| Balu U. | : Tourism in India – Policy and Perspective |
| Gunn C.M. | : Tourism Planning |
| Hall P. | : Urban and Regional Planning |
| Mishra S.K. | : Tourism in India – Policy and Perspective |

APPENDIX - AZ33

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
Choice Based Credit System
B.A. History (Vocational)
Tourism
SYLLABUS FOR III to VI SEMESTER

Semester III

Sl. no	Subject	Hours	Credit
1	<i>Part I</i> Tamil / Other languages 1 course	6	3
2	<i>Part II</i> English (1 Course)	6	3
3	<i>Core Subject:</i> History of India 1526-1772 AD	6	5
4	<i>Allied II : (Any One)</i> 1. Travel Geography 2. Hotel Management & Hospitality Enterprises 2. Front Office Operation	6	5
5	<i>Part IV</i> <i>Skill - Based : (Any One)</i> 1. Communication Skill 2. Food and Beverage Services	4	4
6	<i>Non - Major Elective I : (Any One)</i> 1. Freedom Movement in India 2. Gandhian Thought (Truth and Non - violence)	2	2
<i>Total</i>		30	22

Semester IV

Sl. no	Subject	Hours	Credit
1	<i>Part I</i> Tamil / Other languages 1 course	6	3
2	<i>Part II</i> English (1 Course)	6	3
3	<i>Part III</i> Core Subject: History of India 1773-1947 AD	6	5
4	<i>Allied II : (Any One)</i> 1. Hospitality Management 2. Contemporary Social Problems 3. Organizational Behaviour	6	5
5	<i>Part IV</i> Skill - Based : (Any One) 1. Tour Operations 2. Epigraphy	4	4
6	<i>Non - Major Elective II : (Any One)</i> 1. Indian Constitution 2. Housekeeping Operations	2	2
7	<i>Part - V - Extension Activity</i> NCC, NSS, YRC / YWF		1
<i>Total</i>		30	23

V Semester

Sl. No	Components	Teaching Hours	Exam Duration	Max. Marks 100		Min. Marks	Credit
				Theory	Internal		
5.1	Part III Core Subjects (2 Courses) History of Tamil Nadu upto 1565 A.D	14	3	75	25	40	10
5.2	History of Europe (1453 - 1789 AD)						
5.3	Major Elective (Any two) (2 courses) Tourism Promotion Publicity and Marketing	12	3	75	25	40	10
5.4	ECO Tourism						
5.5	Principles of Management						

5.6	Part IV Skill - Based subject (1 Course) Common	4	3	75	25	40	4
	Total Course -5	30					24

VI Semester

Sl. No	Components	Teaching Hours	Exam Duration	Max. Marks 100		Min. Marks	Credit
				Theory	Internal		
6.1	Part III Core Subjects (4 Courses) History of Tamil Nadu upto 1565 to 2000 A.D	24	3	75	25	40	20
6.2	History of Europe (1789 -1945 A.D)						
6.3	History of Science and Technology since 1500 A.D						
6.4	Working of the Indian Constitution						
6.5	Major Elective (One course) (Any one) Tourism Organization	6	3	75	25	40	5
	Constitutional History of England (1603 -1970 A.D)						
	History of Russia (1800-1991 A.D)						
	Total courses -5	30					25

SEMESTER - III

Core Subject

HISTORY OF INDIA - 1526 A.D - 1772 A.D

Unit - I

- ❖ Mughal Empire - Sources - India on the Eve of Babur's invasion - Babur's early life - conquests - Administration - Humayun - Shersha.

Unit - II

- ❖ Akbar the Great - Bairamkhan - War with Rajputs Deccan Expedition – Religious Policy - Jahangir. Nurjahan.

Unit - III

- ❖ Shahjahan - Aurangzeb - Decline and Disintegration of the Mughals - Art and Architecture. Deccan Policy - Mughal Administration.

Unit - IV

- ❖ The rule of Marathas - Shivaji - Military achievements - Administration - Art and Architecture - Peshwas - Balaji Viswanath - Baj Rao - Balaj Baj Rao III – Third Battle of Panipat.

Unit - V

- ❖ Advent of the Europeans - The Anglo-French Rivalry - Carnatic wars - Robert Clive - Battle of Plassey - Buxar - Dual Government in Bengal.

BOOKS FOR REFERENCE

1. Mahajan V.D : India since 1526
2. Sri Vasthava : The Mughal Empire
3. Ishwariprasad : History of Modern India
4. Lane Poole : History of India
5. Thripathi .R.P : Rise and fall of the Mughal Empire.

Semester – III

Skill Based - 1

Communication Skill

Unit 1 Listening Skills

Types of Listening (theory /definition) - Tips for Effective Listening - Academic Listening- (lecturing) - Listening to Talks and Presentations - Listening to Announcements- (railway/ bus stations/ airport /stadium announcement etc.) - Listening to Radio and Television

Unit 2 Telephone Skills

· Basics of Telephone communication · How to handle calls- telephone manners
· Leaving a message · Making requests · Greeting and Leave Taking over phone(etiquette)
· Asking for and giving information · Giving Instructions · Listening for Tone/Mood and Attitude at the other end Handling the situations especially trouble shooting -Teleconference handling
Handling Tele interviews for Call Centres

Unit 3 Writing Skills

· Standard Business letter · Report writing · Email drafting and Etiquettes · Preparing Agenda and writing minutes for meetings · Making notes on Business conversations · Effective use of SMS
· Case writing and Documentation

Unit 4 Career Skills

· Applying for job · Cover letters · Resume and Effective Profiling · Interviews · Group discussions

Unit 5 Soft Skills

· Empathy(Understanding of someone else point's of view) · Intrapersonal skills · Interpersonal skills · Problem solving · Reflective thinking · Critical thinking
· Negotiation skills

Books for References:

1. Gantside Modern : Business Correspondent
2. Jane Singleton and Wendy Teraokai : Business Listening and Speaking

SEMESTER III
Skill Based Subject -2
Food & Beverage Services

Unit – I

Introduction to the Food & Beverage industry – Types of catering establishments – Introduction of Food & Beverage Operations.

Unit – II

F & B services areas in a hotel: Restaurant Coffee Shop, room Service, Bars, Banquets, Discotheques, Still Room, Grill Room, Snack Bar, Executive launches, centres & Night Clubs.

Unit – III

F & B service equipment : usage of equipment, criteria for selection, requirements, quantity and types – furniture – linen – Chinaware, silverware & Glassware- disposables.

Unit – IV

Food & Beverage Service Personnel – Job descriptions & Job Specifications of F&B Service staff – attitude & Attributes of a Food & Beverage personnel, competencies – Basic Etiquettes for Catering staff – Interdepartmental relationships.

Unit – V

F & S Service Methods : Table Service-silver/ English, family, American, Butler/French, Russian – Self Service – Buffet & Cafeteria – specialized service – Guerdon , tray, Trolley, Lounge – Room, etc.

Books for Reference

1. Food & Beverage service Training Manual - Sudhir Andrews, Tata McGraw Hill
2. Food & Beverage Service - Lillicrap & Cousins, ELBS
3. Modern Restaurant Service - John Fuiler, Hutchinson
4. Professional Food & Beverage Service Management- Brain Varghese

Semester – III
Allied – 1
Travel Geography

Unit – I

Geographical features, location, physiography, metrology etc. – topography and geology-natural vegetation – population and human development – drainage.

Unit- II

Geography of tourism: Overview- world's continents – longitude and Gratitude of map reading skills – Exploring the countries of the world and cities.

Unit- III

Natural tourist resources – land forms & terrains – tourist destinations – water bodies – hill af mountain resorts – sanctuaries – monuments, historical and archaeological sites, museum and art galleries etc.

Unit – IV

Development of Tourism in India with special reference to geography – Impact Assessment – approaches, methodology and techniques

Unit – V

World time zones – Elapsed travel times – international date line

Books for Reference:

- | | |
|------------------|--|
| 1. Bhatia A.K. | - Tourism Development, Principles and Practices |
| 2. Dubey & Negi | - Economic Geographic |
| 3. Jagmohan Negi | - Tourism Guide and Tour Operation : Planning and Organizing |

Semester – III
Allied – 2

Hotel Management & Hospitality
Enterprises

UNIT-I

THE HOSPITALITY INDUSTRY:

Hotel Definition, Classifying Hotels by Size and Target Markets: Commercial Hotels, Airport Hotels, Suite Hotels, Extended Stay Hotels, Residential Hotels, Resort Hotels, Bed and Breakfast Hotels, Time-Share and Condominium Hotels, Casino Hotels, Conference Centers, Convention Hotels, Time Share Alternative Lodging Properties

UNIT-II

HOTEL ORGANIZATION

Hotel Organization :Organizational Missions, Goals, Strategies and Tactics Hotel Organization :Organization Charts, Classifying Functional Areas, Rooms Division, Food and Beverage Division, Sales and Marketing Division, Accounting Division, Engineering and Maintenance Division, Security Division, Human Resources Division, Other Divisions

UNIT - III

RESTAURANT BUSINESS:

Organisation, Chain – Independent / Franchise

UNIT – IV

FOOD SERVICE DEMAND:

The changing Age Composition of our population, Other Demographic Factors, Supply Labour, Work force Diversity, Competitions with other Industries

UNIT –V

THE PRINCIPLES OF HOSPITALITY MANAGEMENT:

Planning in Organizations, Departmentalization, Selection and Employment, Characteristic of Control System, Element of leading and Directing,

Books for Reference:

1. Jitendra K. Sharma : Hotel Management and Hospitality Management
2. Amirk Singh Sudan : Encyclopedia of Hotel and Hospitality Management

Semester – III
Allied - 3
FRONT OFFICE OPERATION

UNIT-I INTRODUCTION TO HOTEL & CATERING INDUSTRY

- Evolution of Hotel Industry in India & Abroad.
- Growth and development of Hotels in India.
- Inter relationship between Travel, Tourism and Hospitality
- Role of Travel Agents and Airlines
- Types of Hotels, Lodging – Ownership, affiliation & management contracts
- Classifying hotels and levels of service

UNIT-II ORGANISATIONAL CHART OF HOTELS

- Hotel Organisational chart of small, medium and large hotels
- Hierarchy chart of front office department of small, medium and large hotel
- Role & functions of front office
- Guest Cycle
- F.O. co-ordination with other departments
- Job description and job specification with examples

UNIT – III

RESERVATION SECTION

- Reservation/ prearrival phase & Guest Cycle
- Importance and definition of reservation
- Sources and modes of Reservation.
- Systems of reservations – Manual and Automated
- Processing a reservation – Booking, blocking, availability, confirmation and storage of information
- Processing reservation – FIT, Group
- Amendment and cancellation
- Types of reservation – guaranteed, non-guaranteed
- Over booking policy

UNIT- IV POST REGISTRATION ACTIVITIES

- Rooming & handling C-forms.
- Travel agents voucher.
- Luggage handling.
- Amenities and special arrangements.

UNIT- V LAYOUT & EQUIPMENT

- Layout of the front office.
- F.O. Equipments

Books for Reference :

1. Front Office Operation by Colin Dix & Chirs Baird
2. Front Office Training Manual by Sudhir Andrew
3. Principles of Hotel Front Office Operations, Sue Baker & Jeremy Huyton, Continum
4. Front Office Procedures, Social Skills and Management, Peter Aboott & Sue Lewry Butterworth Heinemann

SEMESTER – III
Non-Major Elective
FREEDOM MOVEMENT IN INDIA

Unit - I

- ❖ Rise of Indian Nationalism - Birth of Indian National Congress - Aims - Surat Split - Moderate Nationalism - Militant Nationalism - Muslim League - Home Rule Movement.

Unit - II

- ❖ Gandhian Era - Rowlatt Satyagraha of 1919 - Non-Co-operation Movement - Boycotts - Chauri Chaura incident - The Swarajya Party.

Unit - III

- ❖ Simon Commission Report - Nehru Report - Muslim Reaction - Jinnah's 14 points - Poorna Swaraj Resolution.

Unit - IV

- ❖ Civil Disobedience Movement - Salt Satyagraha - Gandhi - Irvin Pact - Round Table Conference - Communal Award - Poona Pact - Cripp's Mission - Failure.

Unit - V

- ❖ Quit India Movement - Resolution - Arrest of Leaders - Mass Movements - Failure - Indian National Army - Wavell Plan - Cabinet Mission Plan - Mountbatten Plan - Independence Act of 1947.

BOOKS FOR REFERENCE

1. V.D Mahajan : Modern India
2. Majumdar R.C : Advanced History of Modern India
3. P.E. Roberts : History of British India
4. Sumit Sarkar : Modern India
5. R.C. Agarwal : Constitutional Development of India and Freedom Movement

SEMESTER - III
Non - Major Elective

GANDHIAN THOUGHT (TRUTH AND NON-VIOLENCE)

Unit - I

- ❖ **Truth** - Its Meanings - Evolution of Truth - Truth and World Religion - Truth and Great Thinkers and Philosophers.

Unit - II

- ❖ **Gandhian Conception of Truth** - God is Truth and Truth is God - Experiments in Truth - Absolute Truth and Relative Truth - Realization of Truth and Educating the People (Conscientization) - Truth and Non-Violence.

Unit - III

- ❖ **Non-Violence** - Its Meaning and the Conceptual Frame work.

Unit - IV

- ❖ **Non-Violence and World Religion** - Non-Violence and Great Thinkers and Philosophers - Non-Violence and its application.

Unit - V

- ❖ **Theories of Non-Violence** - Types of Non-Violence - Inaction, Violent Action and Non-Violent Actions - Passive Resistance - Non-Violent Direct Action - Satyagraha - Non-Violent or Non-Existence.

BOOKS FOR REFERENCE

1. Gandhi, M.K., Non-violence in War & Peace, 2 vols. Navajeevan Publications, Ahmadabad.
2. Horsburg, H.J.N., Non-violence and Aggression.
3. Kantilal Shah, Vinoba on Gandhi, Ch.9 & 10.
4. Mahadevan, T.K., Truth and Non-violence, Gandhi Peace Foundation, Delhi.
5. Richard B. Gregg, The Power of Non-violence, Navajeevan Publications, Ahmadabad
6. Theo P. Lentz, Towards a Science of Peace.
7. Yogendra Singh, Traditions of Non-violence.

SEMESTER - IV
Core Subject
HISTORY OF INDIA (1773 A.D. - 1947 A.D.)

- Unit – I** : Lord Warren Hastings – Reforms – Impeachment – Lord Cornwallis – Reforms – Permanent Revenue Settlement – Lord Wellesley – The subsidiary alliance – Conquests – Anglo – Marathawars – Lord Hastings – Lord William Bentinck – Reforms – Ranjit Singh – Anglo Sikh Wars.
- Unit – II** : Lord Dalhousie – Reforms – Doctrine of Lapse – Annexations – Sepoy mutiny of 1857 – Nature, causes and results – Lord Canning – Lord Lytton – Lord Ripon – Lord Ripon – Lord Curzon – partition of Bengal.
- Unit – III** : Constitutional development – Regulating Act of 1773 – The Act of 1861 – The Act of 1892 – Minto Morley Reforms Act of 1909 – Montagu Chelmsford Reforms, Act of 1919 – Government India Act of 1935.
- Unit – IV** : Socio – Religious reform movements – Development of Education – Growth of local self government – Impact of British rule in India – Anti-caste movements Vaikkam movement – Legacy of British rule.
- Unit – V** : Emergency of Nationalism – Indian National Congress Indian National Leaders : Dadabai Naoroji – Surendranatt Banerji – Gokhale – Thilak – Anne Besant – Mahatma Gandhi – Jawaharlal Nehru.

Book for Reference:

- 1) Mahajan, V.D : India since 1526
- 2) Roberts, P.E : History of British India
- 3) Majumdar, R.C : An advanced History of India
- 4) Sumit Sarkar : Modern India
- 5) Sathianathair : History of India
- 6) Dharmaraj : History of India, 1761-1947 (Tamil)
- 7) Rai Choudri, S.C : History of Modern India
- 8) Grovet, B.L : A new look on Modern Indian History

Semester – IV
Skill Based – 1
Tour operations

Unit-I

Travel agency, definitions and its scope – Definition of a tour operator and their functions – History of Travel agency and present status of travel agency system in India & abroad.

Unit-II

Procedure for approval of a travel agency and tour operator to sell tourism pertaining to Travel agency and tour operator. Organisation & structure of a travel agency and tour operation.

Unit-III

Ticketing, Itinerary preparation & Marketing of tourism products or packages by travel agency & tour operator. Linkages & arrangements of a travel agency , tour operator with hotels, airlines and other transport agencies.

Unit-IV

The need for professionalization & the job training for a travel agency & tour operator.

Unit - V

Management of private & public airlines in India, Case studies of Sahara, Jet etc.

Books for reference:

1. A.K Bhatia - Tourism development , principles & practices
2. VTC Middleton - Marketing in travel & tourism , Hein man publications
3. JMS & Nagi - Tourism & Hoteliering , Gethanjali publications
4. Michael Hall C - Tourism planning, Policies, Processes & Relationships, Pearson Education Ltd.
5. Javid Akhbar - Tourism Management in India , Ashish anew Delhi 1990.

SEMESTER - IV
Skill - Based Subject
EPIGRAPHY

Unit - I

- ❖ Introduction - Importance of Epigraphy - Origin and Growth - Kinds of Inscriptions - Literary, Political, Religious, Memorial, Legal, Welfare, Social Status and Spurious - Contents and Conventions.

Unit - II

- ❖ Evolution of Scripts - Paleography - Pictographic - Ideographic - Phonograph - Logograph - Cuneiform - Graffiti - Linear - Brahmi - Vatteluthu - Grantha - Writing materials - Decipherment.

Unit - III

- ❖ Dating System - Eras - Saka Era - Kali Era - Vikrama Era - Kollam Era - Estempaging of Inscriptions.

Unit - IV

- ❖ Eminent Epigraphists - George Buhler - J.F.Fleet - James Burgess - H.Krishna Sastri - V.Venkaya - B.L. Rice - Robert Sewell - E.Hultzeh - K.V. Subramaniya Iyer.

Unit - V

- ❖ Inscriptions - Case Studies - Velivikkudi Grant - Uttaramerur Inscription - Kuram Copper Plates - Kanyakumari Inscriptions.

BOOKS FOR REFERENCE

1. Subramanian, T.N. : South Indian Temple Inscriptions
2. Sadasiva Pandaratar. T.V. : Pirkala Cholar Varalaru
3. Sircar, D.C. : Indian Epigraphy
4. Dikshidar, V.R.R. : Select South Indian Inscriptions.

Semester – IV
Allied- 1
Hospitality Management

Unit – I

Introduction to Hotel industry – Growth of the hotel industry in India – Classification & types of Hotel industry

Unit – II

Introduction to front office – reception – reservation – check out procedures

Unit – III

Hotel business and brand management – marketing – conference

Unit – IV

Department of an approved hotel – food and beverage Management

Unit – V

Multi national Chains of hotels – functioning of private and public sector hotels in India : Taj, Oberoi, Ashok hotels etc.

Books for Reference:

1. Jagmohan Negi : Hotel Classification and Grading
2. Jitendra K. Sharma : Hotel Management and Hospitality Management
3. Amirk Singh Sudan : Encyclopedia of Hotel and Hospitality Management

SEMESTER – IV
Allied - II – Sociology
CONTEMPORARY SOCIAL PROBLEMS

Unit - I : Social Problem

Definition. General Characteristics. Causes. Types. Process of development of a social problem. Society's response to a social problem. Perspectives : Social Disorganization Perspective. Value - Conflict Perspective.

Unit - II : Drug and Alcoholism

Drug Abuse : Definition. Classification. Extent of the Problem. Causes. Social implications of drug abuse. Measures to treat and prevent drug abuse.

Alcoholism : Meaning. Extent of the Problem. Causes and Effects. Measures to treat and prevent alcoholism.

Unit - III : Child Labour

Definition. Causes. Effects of the Problem. Legal Measures to eradicate the problem. Child Labour Eradication Programmes in India.

Unit - IV : Aids

Meaning. Extent of the problem. Modes of transmission. Its stages of development. Its impact on the affected individual, family and society. Protective and preventive measures.

Unit - V : Terrorism

Concept. Characteristics. Theoretical (Relative Deprivation Theory) Explanation for Terrorism. Legal Measures for combating the problem.

BOOKS FOR REFERENCE

1. Julin, Joseph, **Social Problem**, New Jersey: Printice-Hall, Englewood Cliffs, 1977.
2. Scarpitti, Franx.R., and Andersohn, Margaret. L. **Social Problems**, New York : Harper Row, 1989.
3. Merton, Rober K., and Nisbet, Robert. **A Contemporary Social Problems**. New York: Harccurt Brace, 1991.
4. Lamert, Edwin M. **Social Pathology**, New York: McGraw-hill Book Company, 1991.
5. Ahuja, Ram., **Social Problems in India**, Jaipur: Rawat Publications, 1992.

Semester – IV
Allied- 3
Organizational Behaviour

Unit – I

Importance and scope of organizational psychology – Individual difference – intelligence tests – Measurement of intelligence – personality tests – nature, types and uses.

Unit – II

Perception – Factors affecting perception – Motivation – theories – financial and non-financial motivation – techniques of motivation – transactional Analysis – Brain storming.

Unit – III

Job satisfaction – meaning- factors- theories – management of job satisfaction- morale – importance – Employee attitude and behavior and their significance to employee productivity – job enrichment – enlargement

Unit – IV

Group Dynamics – Cohesiveness – Co-operation – competition – conflict – types of conflict – resolution of conflict – socio metry – group norms – role – position – status – supervision style – training for supervisions.

Unit – V

Leadership – types – theories – leadership and evaluation – organizational climate – organizational effectiveness – organizational development – counseling and guidance – Importance of counselor – types of counseling – information needed for counseling.

Books for Reference:

- | | |
|-----------------|----------------------------|
| 1. Keith Davis | - Human Behaviour at work |
| 2. Ghos | - Industrial Psychology |
| 3. Fred Luthans | - Organizational Behaviour |
| 4. L.M Prasad | - Organizational Behaviour |
| 5. Hippo | - organizational Behaviour |

SEMESTER – IV
Non - Major Elective II
INDIAN CONSTITUTION

Unit - I

- ❖ Framing of the Indian Constitution - Salient Features of the Indian Constitution - Preamble.

Unit - II

- ❖ Fundamental Rights and Fundamental Duties - Directive Principles of State Policy - Amendments.

Unit - III

- ❖ The Executive: President - Vice-President - Prime Minister. The State Government: Governor and Chief Minister.

Unit - IV

- ❖ The Legislature: Lok Sabha - The Speaker. Rajya Sabha: The Process of Law - Making.

Unit - V

- ❖ The Judiciary - The Supreme Court and High Courts - Judicial Review.

BOOKS FOR REFERENCE

1. Sharma M.P : The Government of Indian Republic
2. Kapur Anup chand : Select Constitutions
3. Gokhale B.K. : Political Science
4. Dubey .S.N. : World Constitutions
5. Kapur A.C. : Constitutional History of India.

Semester – IV
Non Major Elective – 2
HOUSE KEEPING OPERATIONS

Unit –I

INTRODUCTION TO HOUSEKEEPING DEPARTMENT - ROLE OF HOUSEKEEPING IN HOSPITALITY INDUSTRY - CLASSIFICATION OF HOTEL - CLASSIFICATION OF ROOMS - LAYOUT OF HOUSEKEEPING DEPARTMENT

UNIT - II

ORGANIZATION OF A HOUSEKEEPING DEPARTMENT - JOB DESCRIPTION OF HOUSEKEEPING PERSONNEL - DEPARTMENT THAT HOUSEKEEPING COORDINATES WITH QUALITIES OF HOUSEKEEPING STAFF

UNIT - III

CLASSIFICATION OF CLEANING EQUIPMENT - MANUAL MECHANICAL – SELECTION CRITERIA OF EQUIPMENT - CLEANING AGENT - SELECTION CRITERIA OF CLEANING AGENT

UNIT - IV

CLASSIFICATION OF CLEANING AGENT (ALKALIS, ACIDS, SOLVENTS, ABRASIVES - DEODORIZING, DISINFECTANT, DISTRIBUTION AND CONTROL) - MAIDS SERVICE ROOM

UNIT - V

LAYOUT AND ESSENTIAL FEATURES - ORGANIZING MAID`S TROLLEY

Books for Reference:

1. Hotel Housekeeping, Sudhir Andrews, Tata McGraw Hill
2. The Professional Housekeeper, Trucker Scheneider, VNR
3. Housekeeping Management for Hotels, Rosemary Hurst, Heinemann

Semester V
Core Subject
HISTORY OF TAMILNADU – UPTO 1565 AD

Unit I

Geographical features of Tamil Nadu – Society – Sangam Age – Political, Social, Economic and Religious conditions – Kalabhras.

Unit II

Origin of the Pallavas – Mahendravarman I – Narasimhavarman I – Contributions of Pallavas to Art and Architecture – Pallava Administration.

Unit III

Imperial Cholas – Paranthaka I – Rajaraja I – Rajendra I – Chalukya Cholas – Kulottungan I, Kulottungan III – Chola administration – Contribution to Literature – Art and Architecture.

Unit IV

First Pandyan Empire – Battle of Thirupurambiam – Second Pandyan Empire – Contribution of Pandyas to Art and Architecture.

Unit V

Invasion of Malik Kafur – Rise of Madurai Sultanate – Impact of Muslim Rule – Tamil Nadu under Vijayanagar Empire – Administration, Art and Literature – Battle of Talaikota – Decline of Vijayanagar Empire.

Books for Reference :

Social History of Tamils	-	Pillai. K.K.
History of the Pallavas of Kanchi	-	Gopalan. R.
The Tamils 1800 years ago	-	Kanakasabhai Pillai
History of Tamil Nadu upto 1336	-	Subramanian. N
History of the Tamils	-	Srinivasa Iyengar P.T.
History of South India	-	Nilakanta Sastri K.A.

Semester V

Core Subject

HISTORY OF EUROPE – 1453 A.D. TO 1789 A.D.

Unit I

The Survey of the condition of Europe at the close of the middle ages - Fall of Constantinople, 1453 A.D. – The Geographical Discoveries – Causes – Effects – Renaissance – causes – Effects on Literature, Art and Science.

Unit II

Reformation movement – Martin Luther and Calvin – Zwingli – Anglicanism - Counter Reformation – Revival of Catholicism – Results of the Reformation.

Unit III

Emergence of Nation States – Rise of Spain – Ferdinand – Isabella – Charles V – Philip II – Foreign Policy – Armada - Dutch War of Independence.

Unit IV

Rise of Bourbon Dynasty – Henry IV – Sully – Richelieu – Cardinal Mazarin - Thirty year's war – causes – course – Results - significance.

Unit V

The Enlightened Despots – Louis XIV – Peter the Great – Catherine II - Frederick the Great – Maria Theresa – Joseph II.

Books for Reference :

- | | | |
|--------------------------------|---|--------------------|
| History of Europe 1450 to 1815 | - | Rao. B.V |
| Modern Europe upto 1945 | - | Verma. S.P |
| History of Europe 1453 – 1789 | - | Arun Bhattacharjee |

Semester V

Major Elective

Tourism Promotion, Publicity and Marketing

Unit – I

Tourism Promotion : Promotion of Marketing Tools – Promotion Planning – Advertising – functions of Advertising Agencies – sales support activities.

Unit – II

Tourism Publicity : Selection of Appropriate tools of publicity – role of films, TV and press — Display – poster display etc.

Unit – III

Tourism Marketing : Purpose and scope – classification of marketing – significance of marketing

Unit – IV

Marketing Pricing policies – Marketing Mix

Unit – V

Marketing Research and Marketing information system – Tourism campaign – international marketing – selling the Tourism Product to different age group.

Books for reference

Ketler Philip : Marketing Management

D.K.J. Maccarthy : Basic Marketing – a Management Approach

K.T. Crampon : An Analysis of Tourist Markets

Semester V
Major Elective
Eco Tourism

Unit I:

Environmental Studies : Definitions, components of environment, types of environment (an overview of food chains, food web and energy flow). Bio – Geo Chemical cycles,

Unit II:

Environmental Pollution – Air, Water and Noise Pollution with special reference to tourism activities. Green house effect. Depletion of ozone layer treats due to global warming.

Unit III:

Concept and Origin : Emergence of Eco-tourism, growth and development. Definitions. Principles of Eco-tourism. An overview of Eco-tourists.

Unit IV:

Eco-tourism Resources in India – Caves, National Parks, Wild life sanctuaries, Tiger Reserves, Biosphere Reserves, Wet lands, Mangroves, Coral reefs and desert Ecosystem.

Unit V:

Eco-tourism Planning and development strategies – Eco-tourism strategies with special reference to Environmental Protection (Environmental Impact Analysis)

Role of Eco tourism in WTO, UNDP, UNEP, Ministry of Tourism GOI - Eco tourism in Tamil nadu.

Books for Reference

1. Baldwin J.H. (1985) Environmental Planning and Management. I.B.D. Dehradun
2. Singh Ratandeep : Handbook of Environmental Guidelines for Indian Tourism – Kanishka Publishers, New Delhi.
3. Romila Chawla : Wildlife Tourism and Development; Sonali Publications, New Delhi.
4. Dash M.C. (1993) fundamentals of Ecology (New Delhi), Tata McGraw Hill Co.Ltd., Publishing Co.Ltd.)
5. Kormandy E.J. (1989) Environmental issues Concerns and Strategies (New Delhi) Ashish
6. Kandari O. P., Chandra Ashish : Tourism Biodiversity & Sustainable Development, Isha Books, Delhi.

Semester V

Major Elective

Principles of Management

UNIT - 1 : HISTORICAL DEVELOPMENT

Definition of Management - Science or Art - Management and Administration - Development of Management Thought - Functions of Management - Types of Business Organisation.

UNIT - 2 : PLANNING

Nature & Purpose - Steps involved in Planning - Objectives - Setting Objectives - Process of Managing by Objectives - Strategies, Policies & Planning Premises- Forecasting - Decision-making.

UNIT - 3 : ORGANISING

Nature and Purpose - Formal and informal organization - Organization Chart - Structure and Process - Departmentation by difference strategies - Line and Staff authority - Staffing - Selection Process – Techniques.

UNIT - 4 : DIRECTING

Scope - Human Factors - Creativity and Innovation - Harmonizing Objectives - Leadership - Types of Leadership Motivation - Hierarchy of needs - Motivation theories -

UNIT - 5 : CONTROLLING

System and process of Controlling - Requirements for effective control - Information Technology in Controlling - Control of Overall Performance - Direct and Preventive Control - Reporting - The Global Environment - Globalization and Liberalization - Global theory of Management.

Books for Reference:

1. Harold Koontz & Heinz Weihrich "Essentials of Management", Tata McGraw-Hill,1998
2. Joseph L Massie "Essentials of Management", Prentice Hall of India, (Pearson) Fourth Edition, 2003.
3. Tripathy PC And Reddy PN, " Principles of Management", Tata McGraw-Hill, 1999.
4. Decenzo David, Robbin Stephen A, "Personnel and Human Resources Management", Prentice Hall of India, 1996
5. JAF Stomer, Freeman R. E and Daniel R Gilbert Management, Pearson Education, Sixth Edition, 2004.
6. Fraidoon Mazda, "Engineering Management", Addison Wesley,-2000.

Semester VI
Core Subject
HISTORY OF TAMILNADU – 1565 A.D. to 2000 A.D.

Unit I

Nayaks of Madurai – Viswanatha Nayak – Thirumalai Nayak – Chockanatha Nayak – Rani Mangammal – Nayaks of Tanjore – Ragunatha Nayak – Vijaya Ragava Nayak – Nayaks of Gingi – Krishnappa II – Contribution of the Nayaks to administration, art and architecture.

Unit II

Sethupathy of Ramnad – Kizhavan Sethupathy – Maratha Rule in Tanjore – Venkoji – Shaji – Serfoji II – Contribution to Art and Architecture.

Unit III

Advent of the British and the French – Carnatic Wars – Mysore wars..

Unit IV

Polygars – Kattabomman – Maruthu Pandyan – South Indian Rebellion – Vellore Mutiny – Impact of British Rule – Ryotwari System.

Unit V

Growth of Education and Press - Justice Party – E.V.Ramasamy and Self Respect Movement – V.O.Chidambaram – C. Subramania Bharathy – Vanchi – Subramania Siva Rajaji – Administration of Kamaraj, C. N. Annathurai, M.G. Ramachandran, M. Karunanithi and J. Jeyalalitha.

Books for Reference:

History of Tamil Nadu	-	Rajayyan. K
History of Tamil Nadu	-	Krishnamurti. V.M
Social History of Tamils	-	Pillai. K.K.
History of Tamil Nadu	-	Chellam. V.T
History of the Nayaks of Madurai	-	Sathiananthaier. R
History of Tamil Nadu Vol II	-	Subramanian. N

Semester VI

Core Subject

HISTORY OF EUROPE – 1789 A.D. TO 1945 A.D.

Unit I

Europe on the eve of the French Revolution- French Revolution – Causes – course – results – Napoleon Bonaparte – Campaigns – Domestic Reforms – The Congress of Vienna - Concert of Europe – The Revolutions of 1830 and 1848 – Metternich – Napoleon III – Domestic Policy and Foreign Policy.

Unit II

Unification of Italy – Unification of Germany – Bismarck's Domestic and Foreign Policy - Franco Prussian War 1871 - Policy of Kaiser William II - Eastern Question – The Greek war of Independence – Crimean war – Congress of Berlin and Balkan wars.

Unit III

Europe on the eve of First World War – First World War – Causes – course and results – Peace of Paris – Peace of Versailles - League of Nations – Russian Revolution, 1917.

Unit IV

Facism in Italy – Mussolini – Foreign Policy - Nazism in Germany – Hitler- Foreign Policy – Turkey Under Mustafa Kamal Pasha.

Unit V

Rome – Berlin – Tokyo Axis – Second World War - causes, course and results - Potsdam conference – U.N.O – Origin – Achievements

Books for Reference :

History of Europe	-	V.D. Mahajan
History of Europe	-	South Gate
History of Europe	-	Kettleby
History of Europe 1789A.D. - 1945 A.D.	-	Arun Bhattacharje

Semester VI

Core Subject

History of Science and Technology since 1500 A.D

Unit-I

Modern era-Impact of Renaissance-on -science and Technology. Nicholas Copernicus-Kepler-Galileo-Toricelli. Rene Descartus-Immanuel kant- Issac Newton-Francis Bacon.

Unit-II

Industrial Revolution-Cotton Mining- Metallurgy -Agrarian Revolution –Plough-Horticulture-Transportation and communication – Discoveries of Henry Cavandish-Joseph Priestely-Lavoisier.

Unit III

Communicative Skills- Telegraph -Telephone- Television - Progress Of Biology- Charles Darwin- Progress in Physics and Mathematics-Michael Faraday- James Clark Maxwell- Progres in Chemistry- John Dalton-Mandeleef -Alfred Nobel –Rontgen- X-Ray-Marie Curie – and Radium- Marconi and Radio .

Unit- IV

Nuclear Space Research- Newtonian Impact – Meteorological Studies- Space Shuttles-Rockets –Albert Einstein- Theory Of Darwin-Rutherford.

Unit-V

Modern Science in India- Pioneers of Indian Science and Technology-Jagadish Chandra Bose-P.Chandra Roy- Srinivasa Ramanujam-C.V.Raman-Harhobind Hharona- Abdul Kalam- Kasthuri Rangan.

Books for reference:

- 1.Vargheese Jeyaraj, “History of Science and Technology”.
- 2.Venkat Raman, “History of Science and Technology”.
- 3.Sinjar, “ A Short History of Science”.
- 4.Charles Van Daren, “History of Knowledge – The Pivot Event”
- 5.Charles Van Daren, “ People and Achievements of World History”.

Semester VI
Core Subject
WORKING OF THE INDIAN CONSTITUTION

Unit I:

Historical Background – Growth of Legislature from 1861 to 1892 – Minto – Marley Reforms of 1909 – Montague Chelms Ford Reforms Act 1919.

Unit II

The Government of India Act 1935 – The Indian Independence Act, 1947 – Framing of the Indian Constitution – Outstanding features of the constitution.

Unit III

Federal System – Government of the Union – the President – Prime Minister and the Council of Ministers – Constitution of Parliament – Functions of Parliament Legislative Procedure – Ordinary Bills – Money Bills – Financial Bill.

Unit IV

Government of the States – Chief Minister and the Council of Ministers – Special Status of Jammu and Kashmir.

Unit V

Organisation of Judiciary – The Supreme Court Appointment of Judges – High Courts – Judicial Review – Fundamental Rights – Amendment of the Constitution.

Books for Reference

- | | | |
|----------------------|---|--|
| 1. Durga Das Basu | - | Introduction to the Constitutions of India |
| 2. Gran Ville Austin | - | The Indian Constitution Corner Stone of a Nation |
| 3. Santhanam | - | Union – State Relation in India |
| 4. A.C. Kapur | - | Constitutional History of India |
| 5. A.V. Pylee | - | Constitutional History of India |
| 6. A.B. Keith | - | Constitutional History of India |

Semester VI
Major Elective
Tourism Organization

Unit – I

Introduction – nature, purpose and kinds of organization – departmentation – committees – structure of informal organization.

Unit – II

National Tourist organizations – travel agents Association of India (TAAI) - _ India Association of Tour operators (IATO) – Federation of Hotel and Restaurant Association of India (FHRAI)

Unit – III

International organizations – Classifications – WTO, IATA, UFTAA, ICAO, WTTC & PATA

Unit – IV

Public Organization in India : Department of Tourism, Government of India – Indian Tourism Development Corporation - State Tourism Organizations – TTDC etc. – India Railways – Ministry of Civil Aviation

Unit – V

International Touring Alliance – World Touring and Automobile Organization (WTAO) – International Automobile Federation (IAF)

Books for Reference

- | | |
|----------------|--|
| Prem Nath Dhar | : International Tourism |
| Prem Nath Dhar | : Development of Tourism and Travel Industry |
| Bhatia A.K. | : Tourism Development |
| Dileep M.I | : Introduction to Tourism : Concepts and Impacts |

Semester VI

Major Elective

Constitutional History of England (1603 – 1970 A.D)

Unit I

Stuart Period – James I and his Parliaments – Struggle between Charles I and the Parliament – The petition of Rights – The eleven years tyranny – The Long Parliament – The Civil War – Causes – Course – Consequences.

Unit II

The Common Wealth – The Constitutional experiments of Oliver Cromwell – The significance of his experiments – the end of the Common Wealth – Restoration – Charles II – James II Glorious revolution of 1688 – Causes – Course – Results – The Bill of Rights – The Act of Settlement.

Unit III

George I and George II – Whig Oligarchy - Emergence of the office of the Prime Minister – Walpole - Origin and development of Cabinet System – George III – his Personal Government – Causes of failure.

Unit IV:

The Age of Reforms – The Parliamentary Reforms Act of 1832 – Relation between the two houses of Parliament – The Parliament Act of 1911 – The Representation of Peoples Act of 1918 and 1928 – Reduction of Voting Age in 1970 – The Chartist Movement –Characteristics –Significance.

Unit V

Constitutional Changes due to the two World Wars – War Cabinet – The Statute of West Minister – The abdication of Edward VIII – The Constitutional Significance – Recent Development in the Political and Constitutional Institution such as (i) Judiciary (ii) The Local Government (iii) The Common Wealth of Nations

Book for Reference

1. L.N. Srivastava - Constitutional History of England
2. Prof. Gultti - History of England since 1760
3. Warner and Martin - Political Constitutional History of England

Semester VI

Major Elective

HISTORY OF RUSSIA (1800-1991A.D)

Unit –I

- Alexander I – Reforms and Achievements. Nicholas I – Decembrist Revolt – His reforms – Crimean war.

Unit –II

- Alexander II the Liberator – His reforms and External Policy. Alexander III – Internal and External Policies.

Unit –III

- Nicholas II – the decline of monarchy – the Russo – Japanese war – the Revolution of 1905 – Political parties – October Manifesto – the Dumas and Stolypin – Russia and the first World War – Bolshevik Revolution- Civil War in Russia.

Unit –IV

- The Constitution of 1924 – Lenin and his New Economic Policy. Joseph Stalin- His reforms – The Constitution of 1936 – USSR and the Second World War.

Unit –V

- Krushchev – Internal and External policies – Breshnew – his Internal and External Policies – progress in Russia – Gorbachev - Dismemberment of Soviet Russia.

BOOKS FOR REFERENCE

1. Thaden Edward – Russia since 1801
2. N. Subramanian – History of Russia
3. Basi – A History of Russia
4. Wadhvani – Rise of Soviet Union to world Power.

APPENDIX - AZ34

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

B.A. ECONOMICS (CBCS)

With effect from the academic year 2012-13

Full Time – 6 Semesters

Regulation Scheme and Syllabus

Regulation

Eligibility for Admission

The candidates for admission into the first semester of the B.A degree in Economics will be required to have qualified the Hr. Secondary Examination conducted by the Board of Higher Secondary Education, Government of Tamil Nadu or any other Examinations accepted by the syndicate as equivalent there to in any subject.

Duration of the Course

The course shall be extended for a period of three academic years consisting of Six semesters with two semesters per year.

Passing requirements

The candidates will be declared to have passed in any subject if he / she secures not less than 40 marks in the university end semesters examinations of their subjects.

Classification of Successful Candidates

A candidate who qualifies for the degree with sixty percent or more shall be declared to have passed the examination in first class.

A candidate who qualifies for the degree with seventy five percent (75%) or more in first appearance shall be declared to have passed the examination in first class with distinction.

All other successful candidates shall be declared to have passed in second class.

Procedure in the Event of Failure

If a candidate fails in a particular subject he/she may reappear for the university Examinations in that subject in subsequent semesters and obtain pass mark.

I. Course Structure for B.A Economics Degree Course under CBCS

I Semester

	Components	Hours	Credits
Part I	Tamil / Other Language (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	Core Subjects (2 Course)	10	10
	Micro Economics -1		
	Economic Statistics – I		
	Allied Subject I (1 Course)	6	5
	Principles of Advertising		
Part IV	Environmental Studies (1 Course)	2	2
	Total (6 Course)	30	23

II Semester

	Components	Hours	Credits
Part I	Tamil / Other Language (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	Core Subjects (2 Course)	10	10
	Micro Economics - II		
	Economic Statistics – II		
	Allied Subject I (1 Course)	6	5
	Principles of Management		
Part IV	Social Value Educations (1 Course)	2	2
	Total (6 Course)	30	23

III Semester

	Components	Hours	Credits
Part I	Tamil / Other Language (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	Core Subjects (1 Course)	6	5
	Mathematical Methods –I		
	Allied Subject II (1 Course)	4	4
	International Economics – I		
Part IV	Skill based subject (1 course)	4	4
	Economics of Salesmanship		
	Non – Major Elective I (1 Course)	2	2
	Economics for Competitive Examinations		
	Total (6 Course)	30	22

IV Semester

	Components	Hours	Credits
Part I	Tamil / Other Language (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	Core Subjects (1 Course)	6	5
	Mathematical Methods –II		
	Allied Subject II (1 Course)	4	4
	International Economics – II		
Part IV	Skill based subject (1 course)		
	Personality Development		
	Non – Major Elective II (1 Course)	2	2
	Globalization and Indian Economy		
Part V	Extension Activity (NCC, NSS, YRC, YWF)		1
	Total (6 Course)	30	23

V Semester

	Components	Hours	Credits
Part III	Core Subjects (2 Course)	14	10
	Macro Economics – I		
	Monetary Economics		
	Major Elective (2 Course)	12	10
	Entrepreneurial Development		
	Labour Economics		
Part IV	Skill based subject (Common) (1 course)	4	4
	Tourism Management		
	Total (6 Course)	30	24

VI Semester

	Components	Hours	Credits
Part III	Core Subjects (4 Course)	24	20
	Macro Economics – II		
	Banking Theory and Practice		
	Indian Economy		
	Public Finance		
	Major Elective (1 Course)	6	5
	Economics of Marketing		
	Total (5 Course)	30	25

Total Number of courses : 34

Total Number of Hours : 180

Total Number of Credits : 140

Distribution of Marks in Theory between External and Internal Assessment is 75.25

Pass minimum of 40% for external and overall components.

III – SEMESTER

CORE SUBJECT

MATHEMATICAL METHODS - I

Maximum : 75 marks

Hours : 6 hrs

Objective

To enrich the students with the important Mathematical devices for research.

Unit – I Elementary mathematics

Number system – Algebraic Expressions – Sequences and Series – Graphs – Application of Graphs in Economics – Theory of Indices.

Unit - II Set and relations

Set – meaning – types of sets – Set operations – Venn diagram – Cartesian products.

Unit – III Functions and equations

Functions- types of functions – application of functions in Economics – Equations – Types of Equations (Linear, Quadratic and polynomial), solving linear and Quadratic Equations – Application of Equations in Economics.

Unit – IV Analytical geometry

Distance between two points in a plane – slope of a straight line. Different types of Equations of a straight line – Intersection of two lines – Perpendicular lines – Application of straight lines of Economics.

Unit – V Commercial arithmetics

Percentage –Ratio and proportion – simple interest – Compound Interest – Annuities – depreciation – Discounts – Banker's Discount – True Discount.

References

1. Mathematical Methods - Dr.Bose
2. Mathematics for Economics - D.R.Agarwal

III – SEMESTER

ALLIED – II

INTERNATIONAL ECONOMICS - I

Maximum : 75 marks

Hours : 6 hrs

Objective

To enable the students to understand the various aspects of international trade.

Unit – I Introduction

Differences between international trade and internal trade – merits and demerits of international trade.

Unit - II Free trade Vs protection

Free Trade – meaning – advantages and Disadvantages – Protection- meaning – advantages and disadvantages – kinds and effects of protection.

Unit – III Dumping & Terms of trade

Dumping – Deflation – different forms of dumping – anti dumping measures – Terms of Trade – meaning – factors affecting terms of Trade – Terms of Trade and economic Development Tariffs and terms of Trade.

Unit – IV Balance of payment

Meaning and types of balance of trade and balance of payment – difference between balance of payment and balance of trade – structure of balance of payment – kinds of disequilibrium in balance of payments – causes and remedial measures.

Unit – V Foreign exchange and exchange control

Meaning – foreign exchange rate and its determination – purchasing power parity theory. Exchange control – Meaning- objectives – methods of exchange control – Direct and indirect methods of Exchange control.

Reference

1. International Economics - M.L.Jhingan
2. International Economics - D.M.Mithani

III – SEMESTER

ECONOMICS OF SALESMANSHIP

SKILL BASED

Maximum : 75 marks
Hours : 4 hrs

Objective

To develop salesmanship skills in students.

Unit – I

Salesmanship definition – is salesmanship a Science, an Art or a Profession?
Creative Salesmanship and Competitive Salesmanship. Sales Organization –
Organisation of Sales Department.

Unit - II

Duties of sales manager – sales supervision – Salesman’s report. Selection and
Training of Salesmen.

Unit – III

Sales territories – sales Quotas – sales personality. Important personality Traits.

Unit – IV

Knowledge of goods – Methods of acquiring product knowledge, Important Buying
motives.

Unit – V

Effective presentation and demonstration. Overcoming objections and closing the
sales.

Reference

1. Salesmanship - Dr.Varma & Agarwal
2. Salesmanship - Dr. Ashok & Jeyalakshmi

ECONOMICS FOR COMPETITIVE EXAMINATIONS

Maximum : 75 marks

Hours : 2 hrs

Objective

To equip students with the knowledge of Economics for competitive examinations.

Unit – I Introduction to economics

Meaning and scope of economics – basic concepts in Economics – Human wants – Goods – Utility – Value – Price – Income – wealth – Welfare – Market – Cost – Revenue.

Unit - II Consumption

Meaning of the terms – consumer – consumption – utility maximization – Law of diminishing Marginal utility – Law of Demand – Law of Equimarginal Utility – The concept of Consumer's Surplus.

Unit – III Production and distribution

Meaning of the terms – producer – production – Factors of production – law of returns Meaning of the terms – Rent, wages, interest, profit.

Unit – IV Product pricing

Perfect competition – Imperfect Competition – Monopoly.

Unit – V Investment

Meaning of the term investment – Investment opportunities in shares, Bank Deposits, Real estates. Small savings schemes, insurance schemes, investment in companies and investment in gold.

Reference

1. Micro Economics - M.L.Seth
2. Principles of Economics - K.P.M.Sundaram

IV – SEMESTER

CORE SUBJECT

MATHEMATICAL METHODS - II

Maximum : 75 marks
Hours : 6 hrs

Unit – I Matrices

Meaning – order of a matrix – types of Matrices – Matrix operations – determinants – properties of Determinants – inverse of a matrix – Solving the Equations (Cramer's Rule).

Unit - II Applications of matrices in input –output Analysis

Input – output analysis – meaning – basic concepts – assumptions – applications of matrices in two sector economy – three sector economy – Linear programming – meaning – basic concepts – and notations – Graphical solutions.

Unit – III Differential calculus

Meaning – Rules of Derivatives – Higher order Derivatives – Maxima and Minima – Application of Derivatives in Economics.

Unit – IV Partial derivatives

Meaning – Rules of Partial Derivatives – Euler's Theorem – Application of partial derivative in Economics.

Unit – V Integral calculus

Meaning – types of integrals – rules of integration – definite integrals – application of integrals in economics – consumer's surplus – producer's Surplus.

Reference

1. Mathematical Methods - Dr. Bose
2. Mathematical & Statistical for Economics - G.S.Mongia

INTERNATIONAL ECONOMICS - II

Maximum : 75 marks
Hours : 6 hrs

Unit – I Theories of international trade

The classical theory – Comparative cost theory – modern theory

Unit – II State trading and international trade agreements

Meaning – forms of state trading – objectives – merits and demerits – states trading corporation of India – international Trade Agreements – Bilateral Agreements – Multilateral agreements – general agreements: GATT and WTO

Unit – III International financial institutions

IMF – Objectives – functions – organizations and structure – the World Bank (IBRD) organization and structure – objectives – functions – IBRD and India – affiliates of the world Bank, IFC, IDA & ADB.

Unit – IV Recent trends in India's Foreign trade

Features of foreign trade – Volume – Composition – Direction of foreign Trade.

Unit – V Foreign trade policy of India

Main features of foreign trade policy – phases of foreign trade policy – new Trade policy 2000 – Import restrictions – Export promotion.

Reference

1. International Economics - D.M.Mithani, Dr.S.S.M.Desai
2. International Economics - M.L.Jhingan
3. International Economics - Francis Cherunilaum
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IV– SEMESTER

NON- MAJOR ELECTIVE

GLOBALISATION AND INDIAN ECONOMY

Maximum : 75 marks

Hours : 2 hrs

Objective

To give the students an understanding of the globalization process and to equip them with some knowledge of the happenings in the economy.

Unit – I Introduction

Meaning – features – components – Globalisation of market, production, investment, and Technology. Advantages and Disadvantages of Globalisation.

Unit - II Globalization and poverty

Reasons in favour of poverty Alleviation – Increased production of Agricultural goods – Export growth – Incoming foreign investment – increased demand for unskilled labour.

Reasons for increase in poverty – Impediments to exports a major concern – persistent inequalities – Poor left helpless and prevented from participating in growth.

Unit – III Globalisation and unemployment

Reason in favour of increased employment opportunities – Export of jobs to developed countries- Brain drain reduced – creation of jobs by multi National Corporations.

Reasons for unemployment – Destruction of jobs by MNC – No Job Security – shifting places and occupations in search of employment – Low wages and low labour standards – Demand for lower skilled workers diminishing.

Remedy – to become a global worker – more scope in Asian countries.

Unit – IV Globalization and food security

Chronic food and nutrition insecurity.

Globalisation and social security.

No permanent Job – Bargaining power reduced – No union – No pension.

Unit – V Impact of globalization

Positive impact – India has been a significant beneficiary –inflow of foreign direct investment, investment in education and other social capital –increased production of Agricultural products – Industrial growth – export increase – Increased demand for unskilled labour.

Negative impact – economic stagnation – Deindustrialization – Economic destabilization – Growing inequality – Crisis in the IT sector and Banking sector.

Reference

1. Indian Economy - Ruddar Dutt & K.P.M Sundaram
2. Globalization Strategies and Economic Liberalization - G.S.Batra Narinder Haver

IV – SEMESTER

SKILL BASED

PERSONALITY DEVELOPMENT

Maximum : 75 marks

Hours : 4 hrs

Objective

To enable the students to develop their personal skills in various aspects.

Unit – I

Personality – Meaning, definition – Determinants of Personality – Major traits – Theories of Personality Development

Unit - II

PERSONALITY CONCEPTS – Self image; self esteem, self-monitoring – Advantages and disadvantages of self-monitoring, perception – meaning; process of perception; factors influencing perception, Errors in perception – Attitudes – Types of attitudes and factors influencing attitudes.

Unit – III

LEADERSHIP – Definition of leadership – Leadership styles – Theories of Leadership – Qualities of an effective leader.

Unit – IV

SKILLS – Meaning and types of skills; communication – Definition Importance and process of communication; Methods of Communication – Barriers in Communication and techniques of effective communication

Unit – V

INTERVIEW – Meaning and types of interview – planning for an interview – Types of questions in interview – Employer's expectations from a candidate.

Reference

1. Personality Development - Book of M.S.University Publications

V – SEMESTER

CORE SUBJECT

MACRO ECONOMICS - I

Maximum : 75 marks

Hours : 7 hrs

Objective

To understand macro economic concepts, theories and policies.

Unit – I Introduction

Meaning of Macro Economics – Difference between Macro and Micro Economics – Importance and Limitations of Macro Economic analysis.

Unit - II National Income

The concept – definition and meaning – personal income and disposable personal income – the concept of Gross Domestic Product (GDP) – Gross National Product (GNP) and Net National Product (NNP) – National Income Accounting.

Unit – III Theory of Employment

Meaning of full employment – types of unemployment, seasonal, frictional, technological, structural, voluntary and involuntary, cyclical and disguised unemployment.

Classical theory of output and employment: Say's law of Market – Classical theory with saving and investment – Pigou's view regarding involuntary unemployment.

Keynesian Concept of equilibrium of the economy.

Unit – IV Consumption Function

Consumption and income – Average and marginal propensity to consume and relationship between the two-Keyne's psychological law of consumption – Practical utility and theoretical importance of Consumption function.

Unit – V Multiplier and Accelerator

Multiplier – Meaning, relationship with marginal propensity to consume – size of multiplier – Importance. Acceleration – Meaning – Principle – Assumptions – Importance – Limitations.

Reference

1. Macro Economic Theory - M.L.Jhingan
2. Macro Economics - H.C.Ahiya

V – SEMESTER

CORE SUBJECT

MONETARY ECONOMICS

Maximum : 75 marks

Hours : 7 hrs

Objective

To enhance the students with the knowledge and understanding of the concept of Money, Inflation, deflation and Trade cycle.

Unit – I Evolution and Money

Barter System – Meaning and Disadvantages – Evolution of Money – Nature and Definitions of Money – Functions of Money – Kinds of Money – Qualities of Good Money.

Unit - II Monetary Standards

Meaning and Types of Monetary Standards – Monometallism – Bimetallism – Gresham's Law – Paper Currency Standard – Principles of Note Issue – Systems of Note – Issue – Merits and Demerits of the Paper Currency Standards.

Unit – III Value of Money

Concept of Money Supply – Determinants of Money Supply – Classical view – Keynesian Approach – Meaning of Value of Money – Measurement of changes in the value of Money.

Monetary Theories – Quantity Theory of Money – Fisher's Cash – Transactions Approach – The Cambridge School's Cash – Balance Approach – Savings and Investment Theory.

Unit – IV Inflation and Deflation

Meaning of Inflation – Features – The Inflationary Gap – Causes of Inflation – Effects of Inflation – Measures to control Inflation – Deflation – Meaning, Features, Causes and Effects – Anti – Deflationary Measures.

Unit – V Trade Cycles

Definitions – Characteristics – Phases – Types – Theories of Trade Cycles – Hawtrey's Monetary Theory – Von Hayek's Over – Investment Theory – Schumpeter's Innovation Theory – Keynesian Theory.

Reference

1. Money & Banking - K.P.M.Sundaram
2. Monetary Economics - M.L.Seth

V – SEMESTER

MAJOR ELECTIVE

ENTREPRENEURIAL DEVELOPMENT

Maximum : 75 marks

Hours : 6 hrs

Objective

To enrich the students about the need, supporting facilities and obstacles in entrepreneurship.

To build confidence among the students to launch Entrepreneurial Ventures.

Unit – I Entrepreneurship

Definitions of Entrepreneurship – Types of Entrepreneurs – characteristics of an Entrepreneur – Kao's Conceptual model of Entrepreneurs – Growth of Entrepreneurship in India.

Unit - II Entrepreneurial Motivation

The motivating factors – David Mecclellands' Achievement Motivation Theory – Search and Source of business idea – Idea processing and selection.

Unit – III Project Identification and Classification

Meaning of Project – Project Classification – Project Identification – Desk Research and Techno – Economic Survey Technique – Internal and External constraints – Project life cycle.

Unit – IV Promoting and Starting an Industrial unit

Nature and types of promoters – Steps to start a small scale industry – Incentives and subsidies available.

Unit – V Institutions for Entrepreneurial Development

District Industries Centre – State Small Industries Corporation – Small Industries Development Corporation (SIDCO) in Tamil Nadu – National Small Industries Corporation – Industrial and Technical Consultancy. Organisation of Tamil Nadu – National Alliance of Young Entrepreneurship – Commercial Banks – New Entrepreneurial Development Agency – Directorate of Industries – Indian Investment Centre.

Reference

1. Entrepreneurial Development - C.B.Gupta & N.P.Srinivasan
2. Entrepreneurial Development - Saravanavel

V – SEMESTER

MAJOR ELECTIVE

LABOUR ECONOMICS

Maximum : 75 marks

Hours : 6 hrs

Objective

To study the characteristics of Labour, Trade unions, Industrial disputes, Labour Welfare and security measures with reference to India.

Unit – I Labour as a factor of Production

Characteristics of Labour – Peculiarities of Indian Labour – Efficiency of Indian Labour – Factors affecting Labour.

Unit - II Trade Unions

Types – Objectives of Trade Unions – Functions – Industrial Disputes – Causes - Methods of settling Industrial Disputes – Collective bargaining – Objectives – Process of Collective bargaining.

Unit – III Workers participation in Management

Works committee – Joint Management Council – Workers participation in Management in India – Workers Education – Objectives – Functions – Workers Education in India.

Unit – IV Labour Welfare

Objectives – Intra Mural and Extra Mural Labour, Welfare measures – Aims and Functions of ILO – India and ILO.

Unit – V Social Security

Objectives – Social Security measures in India – Social Insurance – Social Assistance.

Reference

1. Labour Economics - B.P.Tyagi
2. Labour Problems and Social Welfare in India - C.B.Memoria

V – SEMESTER

SKILL BASED

TOURISM MANAGEMENT

Maximum : 75 marks

Hours : 4 hrs

Objective

To enable the students to know the importance and development of tourism in our country.

Unit – I

Definition and Meaning of Tourism – Importance of Tourism – Definition of tourist and tourist product – features – common factors influencing tourism.

Unit - II

Tourism Marketing – features – Marketing process – Tourism promotion – Advertising in tourism.

Unit – III

Accommodation for tourists – Definition and types of hotels – Supplementary accommodation – Advantages of accommodation in tourism

Unit – IV

Information technology in Indian tourism – Application and uses of modern electronic media in tourism – uses of computer technology in tourism field.

Unit – V

Tourist Organizations in India – Travel agencies – Tourism Development Corporation in India.

Reference

1. Tourism Management - A.K.Bhatia
2. Tourism and Cultural Heritage of India - Acharya Ram
3. An Introduction to Tourism - Selvaraj.C
4. Tourism Management - M.S.University Publication bok

VI – SEMESTER

CORE SUBJECT

MACRO ECONOMICS – II

Maximum : 75 marks

Hours : 6 hrs

Unit – I Theories of Distribution

The Ricardian or classical theory of distribution – Criticisms – Marxian theory of Income distribution – critical evaluation – Kaldor's theory of distribution – Critical appraisal of Kaldor's theory.

Unit - II The Investment Function

Meaning of capital and Investment: Types of Investment – Induced Vs Autonomous – Determinants of Investments – Rate of Interest – The Marginal Efficiency of Investment (MEI) – Relation between the MEC (Central stock) and the MEI (Investment) Factors affecting inducement of invest.

Unit – III Applicability of Keynes theory to underdeveloped countries

Keynesian tools and underdeveloped Countries – Policy measures.

Unit – IV Macro Economic Policy

Objectives of Macro Economic Policy – Full Employment, Price stability, Economic Growth – Conflicts of Trade – off in policy objectives – full employment and economic growth – Economic Growth and price Stability – Full Employment and price Stability – Full Employment and Balance of payments – Price stability and Balance of payments – Problem of Coordination - Macro economic policy Objectives – policies for internal and external balance – Fiscal and Monetary policies for internal and external balance.

Unit – V Monetary Policy

Instruments of Monetary policy – Expansionary Monetary policy, Restrictive Monetary policy – Role of Monetary policy in a developing economy.

Reference

1. Macro Economic Theory - M.L.Jhingan
2. Advanced Economic Theory - H.L.Ahuja

VI – SEMESTER

CORE SUBJECT

BANKING THEORY & PRACTICE

Maximum : 75 marks

Hours : 6 hrs

Objective

To enrich the students with the knowledge of Banking functions and operations.

Unit – I Commercial Banking

Definitions of a Commercial Bank – Evolution of Banking – Functions of a Commercial Bank – Role of Commercial banks in the Development of a Country.

Unit - II Structure of Banking System

Unit Banking Vs Branch Banking – Group, Chain and Correspondent Banking – Deposit Banking – Investment Banking – Mixed Banking – Current structure of Commercial banking in India.

Unit – III Banking Operations and Credit Instruments

Credit Creation by Commercial Banks – Cheques – Types of Cheques – Letter of Credit – Drafts, bills of Exchange – Advantages of Instruments.

Unit – IV Central Banking

Definitions of a Central Bank – Functions of a Central Bank – Credit control – Objectives of Credit control – Methods of Credit control – The Reserve Bank of India – Functions – An Evaluation of Reserve Bank's Functions.

Unit – V Modern Banking

Modern Banking – Introduction - E-Banking – Online Transfer of funds – Core – Banking – Methods of Transferring funds - Benefits

VI – SEMESTER**CORE SUBJECT****INDIAN ECONOMY**

Maximum : 75 marks

Hours : 6 hrs

Objective

To enable the students to understand the availability of resources, problems of poverty & unemployment, role of agricultural, industrial and service sectors and planning & reforms of the Indian Economy.

Unit – I a) Resource Profile of India

Importance of Natural Resources – Land and soil – Water – Forest – Minerals and Human Resources.

b) Basic Problems of Indian Economy

Problems of poverty and unemployment – Nature – Causes and remedial measures.

Unit - II Agricultural Sector

Nature and importance – Agricultural Development in India – New Agricultural Strategy and Green Revolution – Technological changes – Inputs – HYV seeds – Chemical fertilizers – Water Management and Irrigation Development – Agricultural Finance – Features – Sources – Cooperatives – Commercial Banks – RPB – Farmers service society – NABARD.

Unit – III Industrial Sector

Importance – Problems of Industrialization – large scale industries – Small and Cottage industries – Meaning and Scope – Role and Contribution problems – Measures for promotion.

Unit – IV Service Sector

Transport Sector – Development and Problems – Transport co-ordination – Scope – Objectives – Mode of Transportation – Roads, Railways, Waterways and Airways. Energy Resources – Banking services in India.

Unit – V Planning and New Economic Reforms

Planning Exercises in India – National Planning Committee – The Planning Commission – Five Year Plans – Objectives, Strategy, Achievements and Failures.

Reference

1. Indian Economy - Rudar Dutt & K.P.M Sundaram
2. Indian Economy - Misra & Puri

VI – SEMESTER**CORE SUBJECT****PUBLIC FINANCE**

Maximum : 75 marks

Hours : 6 hrs

Objective

To enrich the students with the knowledge of Governments' Income, Expenditure, Debt and Budgeting with reference to India.

Unit – I Public Finance

Definition, Scope and Subject – Matter of public finance; Principle of Maximum Social Advantage; the concept of public goods.

Unit - II Public Expenditure

Reasons for the growth of public expenditure with special reference to India; Types of public Expenditure; Causes of Public Expenditure, Effects of Development and Non development expenditure in India.

Unit – III Public Revenue

Sources of Public Revenue – Tax Revenue and Non-Tax Revenue – Objectives of taxation – Direct and Indirect taxes – Characteristics of a Good Tax system. Taxable capacity – Factors determining taxable capacity. Effects of Taxation.

Unit – IV Public Debt

Objectives of Public Borrowing, Reasons for the growth of public Debt, Types of Public debt, Methods of Redemption of public debt, Debt burden in India.

Unit – V Budgeting

Evolution and purpose of Budgeting – Budgetary procedure in India – Budget classification – Programme and Performance Budget – Zero base Budgeting. Recommendations of the last two Finance Commissions.

Reference

1. Public Finance - B.P.Tyagi
2. Public Finance - Theory and Practice – S.K.Singh

ECONOMICS OF MARKETING

Maximum : 75 marks

Hours : 6 hrs

Objective

Students must be able to apply and integrate their knowledge and skill in Marketing to Specific situations through appropriate readings and practical projects.

Unit – I

Meaning of Market – Classification of Markets – Object of Marketing – Importance of Marketing – Marketing and selling – Approaches to the Study of Marketing – Modern Marketing – Role of Marketing in Economic Development.

Unit - II

Marketing Functions – Buying – Kind of Buyers - Problems of Buying – Purchasing Methods (methods of buying) – Assembling – Advantages and Problems – Selling – Kinds of Sale.

Unit – III

Transportation – Functions – Classification – Land, Water and Air – Storage – Advantages – Essentials of a Good Storage – Warehouses – Functions of Warehouses – Classification of Warehouses – Advantages of Warehouses.

Unit – IV

Standardisation – Types of Standards – Grading – Types of Grading – Inspection – Labelling – Object of Labelling – Types of Label – Branding – Reasons for Branding – Functions – Types of Brands Packaging – Functions – Kinds of Packaging – Requisites of a Good Package.

Unit – V

Channels of Distribution – Types of Channels of Distribution – Middlemen – Functions of Middlemen – Wholesaler – Characteristics of Wholesaler – Services Rendered by Wholesaler – Retailer – Functions of Retailer.

Reference

1. Marketing - Rajan Nair
2. Principles of Marketing - Rajan Nair and Ranjit Nair

APPENDIX – AZ35**MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12****CHOICE BASED CREDIT SYSTEM****REVISED COURSE STRUCTURE FOR B.COM****(III SEMESTER TO VI SEMESTER)****(For those who joined the course from the academic year 2012-2013 onwards)****B.COM-III SEMESTER**

Components	Hours	Credits
Part-III- Core Subjects (3Courses)		
1.Advanced Financial Accounting I	6	4
2.Business Mathematics	6	4
3.Modern Banking	6	4
Skill Based Subject (Allied Related)(1 course) (Any One)		
1.Business Communication		
2. Office Management	4	4
Non-major Elective (1Course)(Any One)		
1.Introduction to Accountancy		
2.Consumer Awareness	2	2
Allied subject-II (1Course)		
1. Human Resource Management	6	5
Total (6 courses)	30	23

B.COM - IV SEMESTER

Components	Hours	Credits
Part-III- Core Subjects (2Courses)		
1. Advanced Financial Accounting –II	6	4
2. Business Statistics	6	4
Skill Based Subject (Allied Related)(1 course)(Any One)		
1. Entrepreneurship Development	4	4
2. Career Planning		
Non-major Elective (1Course) (Any One)		
1. Financial Accounting		
2. Human Rights	2	2
Major Elective (1course) (Any one)		
1. Indirect Tax		
2. Stock Market		
3. Investment Management		
4. Office Automation, Theory-4 Hours, Practical -2 hours	6	5
Allied Subject-II (1 Course)		
1. E-Commerce	6	5
Part –V Extension Activity (NCC, NSS,YRC, YWF)		1
Total (6 courses)	30	25

III.B.Com-V Semester

Components	Hours	Credits
Part-III- Core Subjects (3 Courses)		
1.Corporate Accounting I	7	5
2.Cost Accounting	7	5
3.Business Law	6	6
Major Elective (1 Course) (Any One)		
1. Income Tax ,Law & Practice I		
2.Applications of Tally in Accounting (Theory 4 hours, Practical 2 hours)	6	5
3.Logistics Management		
Common Skilled Based Subject (1 Course) (Any One)		
1. Effective Communication	4	4
2.Personality Development		
Total (5 Courses)	30	25

III B.Com-VI Semester

Components	Hours	Credits
Part-III - Core Subjects (4 Courses)		
1.Corporate Accounting II	6	5
2 Management Accounting	6	5
3.Industrial Law	6	5
4.Auditing	6	5
Major Elective (1Course) (Any One)		
1. Income Tax, Law & Practice II		
2. Introduction to RDBMS (Theory 4, practical 2 hours)	6	5
3.Retail Management		
Total (5 courses)	30	25

II B.Com – III Semester Part III Core Subjects-(3courses)

CORE –I - ADVANCED FINANCIAL ACCOUNTING I

UNIT –I

Branch accounting – Meaning-Types of Branches-Debtor’s system - Invoice price Method (excluding stock and debtors system)

Unit - II

Departmental accounts- Meaning – Difference between branch and department accounts- Departmental trading and profit and loss accounts- Basis for allocation of expenses- Departmental transfer at invoice price

Unit III

Hire purchase and installment system-Calculation of cash price and interest- Default and Repossession.- difference between Hire purchase and Installment system-interest suspense account

Unit - IV

Royalty account-Meaning-Minimum rent-Short working- Types of recoupment – strike and lockout.

Unit – V

Insolvency accounts- insolvency of an individual- statement of affairs- Deficiency account.

Theory: 40 marks; Problem: 60 marks

Text &Reference

Advanced Accountancy – Dr. M. A. Arulanandam & K.S. Raman – Himalaya Publishing House

R.L. Gupta and Radhaswamy – Sultan Chand & Sons, New Delhi

Advanced Accountancy – M.C. Shukhla & T.S. Grewal – S.Chand & Company, New Delhi

Advanced Accountancy – S.P. Jain & K.L Narang, Kalyani Publishers, New Delhi

II B.Com – III Semester Part III

Core 2: BUSINESS MATHEMATICS

Unit- I

Number systems and equations: counting techniques

Binominal expansion numbers- natural-whole – rational- irrational – real- algebraic expression – factorization-equations-linear – quadratic- solutions-simultaneous linear equations with two or three unknowns- solutions of quadratic equations- Nature of the roots- forming quadratic equation – permutation- combinations – binomial expansion.

Unit –II

Theory of indices – logarithms and progression indices positive indices- zero and negative indices- fractional indices. Logarithms- properties- laws of logarithms- common logarithms. Arithmetic progression n^{th} term – sum of terms

Unit –III

Analytical geometry: distance between two points in a plane slope of a straight line – equation of straight line – point of intersection of two lines – applications (1) demand and supply (2) cost-output (3) break-even analysis.

Unit –IV

Matrices – basic concepts- matrix addition- scalar multiplication – multiplication of matrix- inverses of a matrix- solution of a system of linear equations- matrix method.

Unit – V

Commercial arithmetic percentages – ratio and proportion – simple interest- compound interest- annuities- depreciation – discount-banker's discount true discount – amortization.

Text book:

1. **Business mathematics D.S Sancheti&V.K.Kapoor, sulthan Chand and sons New Delhi**
2. **A text book of Business Mathematics by G.K. Ranganath- Himalaya Publishing House, Delhi.**
3. **Business Mathematics- D.C.Sanchetti&B.M.Agarwal.**

Theory: 40 marks

Problem:60marks

II B.Com – III Semester Part III Core Subject

CORE 3: MODERN BANKING

UNIT –I

Banking system

Indigenous bankers – commercial banks –co-operative banks- land development Banks-Industrial Development bank-NABARD –E XIM Banks- Foreign Exchange banks- central bank- RBI Vs SBI

UNIT II

Central Banking:

Central bank of india-functions –methods of credit control- traditional and promotional functions – RBI’S monetary policy – opening of new branches – new licensing policy.

UNIT III

Banker and customer

Banker –customer – Relationship between banker and customer- General and special relationship – rights of the banker – cheque: Meaning- essentials of valid cheque- crossing: Definition- types of crossing-endorsement- Types- material alteration- Statutory protection to the paying banker- Statutory protection to the collecting banker.

UNIT IV

Core banking – Home Banking – Retail Banking – Internet banking: Online banking and offline banking – mobile banking-Computerised Banking – Electronic Funds Transfer- ATM and Debit Card – Smart Card – Credit Card – E-Cash- Swift – RTGS– Impact of Technology – Global Developments in Banking Technology.

UNIT V

Modernized banking

Traditional vs E- Banking transactions- Electronic delivery channels-Advantages of e- Banking – constraints in e-Banking security measures.

TEXT & REFERENCE BOOKS

- 1. Banking theory law and practice- K.C Sherlekar**
- 2. Banking theory law and practice-S.N.Lal**
- 3. Banking theory law and practice-M.C Tannen**
- 4. Banking theory law and practice-E.Gordon and K.Natarajan**
- 5. Banking theory law and practice-S.S Gulshan and GulshanK.Kapoor**

II B.COM III SEMESTER Skill based subject(Allied Related)

(1 course)(any one)

1. BUSINESS COMMUNICATION

Unit- I

Introduction – Importance – definition-process of communication- functions-media for communication- communication network- verbal Vs non- verbal communication –barriers to communication- various electronic communication systems.

Unit-II

Business correspondence principles of letter writing – structure and layout-planning and preparation.

Unit –III

Quotations- orders- tenders- sales letters- claim and adjustment letters- credit and collection letters.

Unit – IV

Job related communication- letter of application- drafting the application- elements of structure of application- Resume preparation.

Unit-V

Employment interview- Types of interviews-preparation for the candidates to attend the interview- before the interview- during the interview- interview process- dos and don't and tips for the successful interview.

Text books

- 1. Effective business communication ashakaul prentice hall**
- 2. Business correspondence and report writing – third edition – R.C Sharma & Krishnamohan Tata-McGraw Hill**

Reference books

- 1. Advanced business communication penrosemesberry, myers Thomson south western**
- 2. Business communication marry ellan ,guffey- Thomson-south western.**
- 3. Business correspondence and office management- P.N. GhoseRajendra Paul,J.S.Korlahalli- sultan chand and sons**
- 4. Office management- R.S.N. Pillai, Bagavathi- S.Chand&co**

II B.COM III SEMESTER Skill based subject (Allied Related)

(1 course)(Any one)

2. Office Management

Unit-I

Office – meaning- features- importance- office management- nature, function and scope- office manager- functions and qualification- flow of work- organization charts and manual.

Unit II

Office accommodation- principles- location of an office- layout- office furniture- office environment- office lighting, ventilation, interior decoration- noise and dust- physical hazards, sanitary requirements- cleanliness.

Unit III

Mail and correspondence- handling mails-organization of mailing department- handling inwards and outwards mail- internal and external communication- oral and written communication.

Unit IV

Filing- Essentials of a good filing system- centralized Vs decentralized filing system- classification of filing system- Methods of filing system.

Unit V

Indexing – meaning- objects- Indexing types- forms control and design- continuous stationary.

Text Book:

1. **B.N Tandon, Manual of office management and Correspondence, S. Chand &CoLtd.,New Delhi.**
2. **S.P. Arora- Office Organization and Methods- Vikas Publishing House Private Ltd.,**
3. **R.K.Chopra, office organization and Management, Himalaya Publishing House.**
4. **BalrajDuggal, Office Management and Commercial Correspondence, KitabMahal.**
5. **R.S.N.Pillai and Bagavathy, Commercial Correspondence and office management, S.Chand Company Ltd., New Delhi**

II B.COM III SEMESTER Non Major elective (1course)(any one)

1. Introduction to Accountancy

Unit I

Definition of accounting- accounting concepts- journal

Unit II

Preparation of ledger accounts

Unit III

Subsidiary books- purchase book, sales book, purchase return book, sales return book – simple cash book

Unit IV

Preparation of trail balance

Unit V

Preparation of final accounts (with closing stock and outstanding expenses adjustments only)

Text books

- 1. Advanced accountancy- volume -1 by. T.S. Reddy & MURTHY , MARGHAM publications, Chennai**
- 2. Advanced Accountancy- By M.C.Shukla&T.S.Grewal-S.Chand&Co,New Delhi.**
- 3. Advanced Accountancy- By M.A.Arulanandan&K.S.Raman-Himalaya Publishing House,Mumbai.**
- 4. Accountancy- By P.C.Tulsian, Tata McGraw-Hill edition**
- 5. Accountancy – By S.P. Jain&K.L. Narang, kalyanipublishers,new delhi.**

II B.COM III SEMESTER Non Major elective (1course)(any one)

2. Consumer Awareness

Unit –I

Meaning of consumer- Meaning of consumerism- Objectives-Consumer needs- Types of consumers.

Unit II

Consumer Rights- Meaning and sources- Six rights of the consumers under Consumer Protection Act- Right to safety, information , choice, be heard, Redressal and Consumer education- Consumer responsibility.

Unit III

Exploitation of Consumer- pricing, adulteration, information and labeling, duplication, artificial demand, spurious goods, late deliveries, advertising , poor after sales service, warranty and services, fitness, not honoring terms and conditions for sale and services, financial frauds, credit card frauds and product risk.

Unit IV

Consumer protection- Meaning- Need for consumer protection-why consumer protection?-how can we provide consumer protection?

Unit V

Consumer protection Act-1986- Objectives-Machinery for the speedy settlement of consumer disputes and redressal of grievances – consumer disputes redressal forum at the district level- consumer redressal commission at the state level- National consumer redressal commission at the National level.

Text books

1. **Shri. Ram Khanna ,saivtaHanunspalSheetalKapoor, H.K,Awasthi- Consumer affairs , University press.**
2. **MohineSetr and P. Seetharaman Consumerism A Growing concept phoenix publishers, New Delhi**
3. **R.S.N.Pillai and Bagavathi Modern Marketing Principles and Practices S.Chand and Company.**
4. **M.J.Anotony, Consumer Rights Clarion book.**
5. **S.A.Sherlekar, Marketing management, Himalaya publication house.**

II B.COM III SEMESTER Allied Subject II (I Course)

HUMAN RESOURCE MANAGEMENT

Unit I

Definition- concepts- objectives – characteristics – functions- principles of personal policies- organizational structure.

Unit II

Man power planning- definition – need – process job analysis- job description- job specification – job evaluation- recruitment and selection process.

Unit III

Employee's training- needs- importance- principles- training methods- promotions- types- procedures- promotion policy- demotion – transfer- dismissal- absenteeism- labourturnover performance appraisal methods.

Unit IV

Industrial relations – significance- causes of poor industrial relations- suggestions- labour disputes and settlement – Industrial relations in India.

Unit – V

Workers participation in management- collective bargaining and industrial relations- employee's grievances- procedures- industrial disciplinary system.

Text books

- 1. Human resource management- Dr. C.B.GUPTA,**
- 2. Human resource management- randiL.Decimone Thomson learning third edition.**
- 3. Managing human resources management L.M Prasad, sultan chand& sons.**
- 4. Personal management C.B.Memoria, Himalaya publication house.**

II B.Com – IV Semester PartIII Core Subject – 2 Courses

CORE I

- 1. ADVANCED FINANCIAL ACCOUNTING - II**

Unit-I

Contract Account- Work uncertified- Work certified -work in progress-profit on completed contracts-profit on incomplete contracts-cost plus contract- Farm Accounting.

Unit-II

Partnership account- partner's capital and current account- profit and loss appropriation account

Unit -III

Admission of the partner-new ratio -Gaining ratio -treatment of goodwill-revaluation account - memorandum revaluation account- Balance sheet after adjustment

Unit IV

Retirement of a partner—sacrificing ratio- settlement of retiring partners loan account-death-joint life policy- settlement of executor's account - Amalgamation - sale of partnership firms.

Unit - V

Dissolution of a firm- realization account - conversion of a firm into a company -insolvency of a partner- two partners, GarnerVSMurray- insolvency of all partners

Gradual realization of assets -- piece meal distribution- proportionate capital method- maximum loss method.

Text &Reference Books

- 1) **Advanced Accountancy -S.P.Jain&K.L.Narang-Kalyani Publishers , New Delhi.**
- 2) **Advanced Accountancy-R.L.Gupta and M.Radhaswamy-Sultan Chand&Sons, NewDelhi.**
- 3) **Advanced Accountancy-M.C.Shukla and T,S.Grewal- Sultan Chand&&Co,New Delhi.**
- 4) **Advanced Accountancy-Dr.M.A.Arulanandam&K.S.Raman –Himalaya Publishing House,Mumbai.**
- 5) **)Advanced Accountancy.S.P.Jain &K.L.Narang.Kalyani Publishers.NBew Delhi**

II B.Com – IV Semester Part III Core Subject –
CORE 2
Business Statistics

Unit –I

Definition of statistics- Importance – Application- Limitations and Distrusts of statistics- statistical survey – planning and design of survey- collection of Data – primary and secondary data- Questionnaire and schedule- sampling design- Types of samples- classification of data- Tabulation and presentation of data-Diagrams – Two and three dimensional.

Unit- II

Measures of Central tendency- Mean-Median- Mode-Geometric Mean- Harmonic Mean-Measures of dispersion-Range- Quartile Deviation- Mean Deviation- Standard Deviation- variance- co- efficient of variation- skewness- kurtosis - Moments.

Unit –III

Correlation – meaning- types-scatter diagram – karlpearson'sco-efficient of correlation- Rank correlation- concurrent deviationmethod. Regression analysis- uses- methods of studying regression – Regression lines.

Unit IV

Probability-meaning-usefulness – dependent and independent events- mutually exclusive events- simple and compound events-addition theorem – multiplication theorem- problems.

Unit V

Index numbers- meaning-construction of index numbers- its problems – methods of construction – tests of consistencies- fixed base- chain base-consumer price index- problems.

Analysis of time series- trend seasonal and cyclical variations- irregular fluctuations-Methods of measurements- graphic method – moving average method of least square- problems.

Text books

1. **Statistical Method-Dr. S.P. Gupta-Sultan chand& Sons, New Delhi.**

Books for Reference

1. **Statistics- Theory and practice- R.S.N Pillai&Bhagavathi, S.S.Chand& Co.**
2. **Business Statistic - M.Wilson, Himalaya Publishing House, Mumbai.**

II B.COM IV SEMESTER Skill based subject (Allied related)

1course(Any one)

1. ENTREPRENEURSHIP DEVELOPMENT

Unit 1: Entrepreneurship – meaning- definition- importance – Entrepreneur – types of entrepreneurs – functions of entrepreneurs – qualities of entrepreneurs – entrepreneur as a career – role of entrepreneur in economic development.

Unit II: Factors affecting entrepreneurial growth – economic – social – cultural – psychological and sociological factor – women entrepreneurship – functions and problems of women entrepreneurs

Unit III: MSME – definition – overview of MSME in India – Government policies & support measures – schemes and incentives – problems and prospects of MSME in India – entrepreneurship development programmes.

Unit IV: Industrial finance to entrepreneurs – TIIC, SIDBI and commercial banks. Institutional support to entrepreneurs – EDII - NAYE - KVIC - DIC and industrial estates

Unit V: Project report – meaning and importance – contents of project report – project appraisal – market feasibility – technical feasibility – financial feasibility and economic feasibility

Text and Reference Books:

1. **Entrepreneurship – Robert D Hisrich, Michael P Peters & Dean A Shephard, TataMcgraw Hill Co.**
2. **Entrepreneurship Development – N.P. Srinivasan, Sultan Chand & Sons.**
3. **Entrepreneurship Development – P. Saravanavel, Esspeekay Publishing House.**
4. **Entrepreneurial Development – S.S. Khanka, S. Chand & Sons.**

II B.COM IV SEMESTER Skill based subject (Allied related)

1course (Any one)

2. CAREER PLANNING

Unit –I

Job application- content of an application- Model Application Letter-Resume Building- content of resume – Models of a Resume- Speaking skills- Essentials of a good speech- Content of a speech- qualities of a good speaker- Self introduction- Giving speech on a general topic.

Unit – II

Group Discussion-Meaning- features of Group Discussion- Requirement for effective group discussion- Role to play in Group Discussion- How to Participate in Group Discussion? – Role of Group leader- Model of Group Discussion (class room practice)-Report Writing - Meaning of Report-importance – types- features of a good report- steps in preparing a general report.

Unit III

Interview – Meaning- Types-Significance- Interview Techniques-preparing before interview- How to participate in an interview?-Model Interview (class room practice) – General Awareness preparation.

Unit IV

Test of Numerical Ability (simple question)-Simplification – percentage – profit and loss-Ratio and proportion – Time and work- Time and distance – Calendar-Clock problems

Unit V

Test of Reasoning Ability (verbal only)- Analogy, odd man out, coding and decoding- Direction sense Test- position and order- Alphabet test-Blood Relation-common sense test- puzzle Test.

Reference books:

- 1. Dr. Shubha Miller and S.C. Aggarwal Guide to careers for commerce Graduates.**
- 2. Prakash .J. Shaw- How to Develop your Personality,**
- 3. BevoshBhikshu- Steps to success**

4. Kochar S.K. Educational and vocational Guidance in Colleges and Universities.
5. Mohan.K.and Mani Ram Agrawal-General Knowledge Digest.
6. Arokian J.B. Career Counselling.
7. AgrawalR.S.Modern Approach to Verbal Reasoning
8. Agrawal R.S. Quantitative Apitude.

II B.COM IV SEMESTER Non Major Elective (1Course)(Any One)

1. Financial Accounting

Unit I

Average due date

Unit II

Rectification of Errors

Unit III

Bills of exchange- Retirement, Renewal and dishonor, excluding accommodation Bills

Unit IV

Consignment Accounts- Simple problems only at cost price

Unit V

Joint Venture- Separate set of Books Only

Text books

1. Advanced Accountancy Volume I S.P.Jain&k.lNarang-Kalyani publishers, New Delhi
2. Advanced Accountancy Vol I; R.L.Gupta and M.Radhaswamy- Sultan Chand & Sons, New Delhi.

II B.COM IV SEMESTER Non Major Elective (1Course)(Any One)

2. Human Rights

Unit –I

Meaning- Definition of Human Rights- Characteristics of human rights- kinds of Human Rights-Civil and political- social economic and cultural rights

Unit – II

Violation of human rights- Patterns of violations and abuses- Action against violation of human rights as per Indian law

Unit III

Rights of the Disabled Persons- Declaration on the rights of disabled persons 1975- International year of disabled persons 1981

Unit –IV

Bonded labour- Concepts and definitions- Constitutional and legal provisions- Salient features of bonded labour system(abolition) Act 1976- Role of the national human rights commission

Unit -V

Minorities Rights commission & its functions- Definitions- National commission for minorities- Functions of the commissions

Text books

- 1. Human Rights and Law – Paras Diwan, Peerushi Dewan**
- 2. Human Rights Dr. Giriraj Shah, IPS& K.N. Gupta, IPS**
- 3. Teaching of Human Rights – Jagannath Mohany**

Reference Book

- 1. Human Rights – C.Nirmala Devi**

II B.COM IV SEMESTER Major Elective(1 Course)(Any One)

1. Indirect Tax

Unit –I

Indirect Taxes-meaning- special features- merits-demerits- major reforms in indirect taxation in India.

Unit – II

Central Excise Act 1944- basis condition for excise liability – taxable event- types of excise duty- excisable goods- related buyer- manufacture – processes amounting to manufacture-rules for classification - rules for valuation- transaction value- inclusions and exclusion.

Unit III

Customs Act 1962 – nature of customs duty- taxable event- territorial waters of India-Indian customs waters- types of customs duty- customs value- inclusions and exclusion.

Unit IV

Value Added Tax (VAT)-Meaning- Special features- Need and Mechanism.

Unit –V

Service Tax- Meaning- Need- persons to whom service tax is charged- classification.

Text books:

- 1. Indirect Taxation – Dr.Balachadran, Sultan**
- 2. Central Exercise- V.S.Datey, Taxman publication**
- 3. Indirection Taxes- V.S.Datey, Taxman publication**
- 4. Central Excise for small scale industries- GopinathSarangi**
- 5. Job work for central exercise- B.N.Gururaj**
- 6. A hand book for service tax – C.Parthasarathy&SanjeevAgarwal**
- 7. Customs Law Manual- R.K.Jain**
- 8. Customs Tariff of India – R.K.Jain**

II B.COM IV SEMESTER Major Elective(1 Course)(Any One)

2. Stock Market

Unit-I

Introduction to financial market

Financial market: capital market and money market- functions of financial markets- product dealt in capital markets- importance features of equity shares, mutual fund and derivative products. Product dealt in money market important features of bonds, debentures, commercial paper, treasury bills- important.

Unit II

Market participants and Regulatory frame work

Registered intermediaries : brokers, sub- brokers portfolio managers, bankers to issue, merchant bankers, registrars, underwriters, portfolio managers, credit rating agencies- services rendered by the intermediaries to investors- FIIs and DIIs-ADRs and GDRs.

Unit III

Primary and secondary market

Primary market- its role and functions- principal steps involved in floating a public issue- pricing of issues fixed pricing method and book building method- mediums of secondary market brief description of national stock exchange and Bombay stock exchange and over the counter exchange of India –listing of securities in stock exchanges – listing requirements- benefits of listing- delisting of securities.

Unit – IV

Screen- based trading system and stock market index

Under standing Index numbers methodology for index construction – understanding S&PCN X NIFTY and SENSEX – concept of Risk and return of stock – systematic and Non- systematic risk- diversification of Risk through portfolio of stock.

Unit –V

Depositories

Dematerialization of securities – Benefits of Dematerializing – Depositories- need for establishment of depositories - role played by depositories- depository participants – opening account- with depositories – objectives of depository Act 1996.

REFERENCES

- 1.Bhole,L.M Financial Institutions and Markets(Third ed.Tata Mcgraw Hill PPPublishing company)**
- 2.National Stock Exchange of India, Mumbai.website www.nseindia.com**

II B.COM IV SEMESTER Major Elective(1Course)(Any One)

3. Investment Management

Unit I

Investment- nature and scope of investment analysis-elements of investments-return, risk and time elements- objectives of investment- security, return and risk analysis- measurements of return and risk- approaches to investment analysis.

Unit II

Types of investments- financial investment- securities and derivatives, deposits, tax sheltered investments-non financial investments- real estate, gold and other types and their characteristics- sources of financial information.

Unit III

Fundamental analysis- economic analysis- industrial analysis and company analysis- technical analysis-various prices and volume indicators, indices and moving averages, interpretation of various types of trends and indices.

Unit IV

Valuation of securities- fixed income securities, bonds, debentures, preference shares and convertible securities- variable income securities- equity shares.

Unit V

Investment by individuals- investments policies of individuals – Tax savings schemes in India.

Reference Books:

- 1. Investment Analysis and Management, Clark, James Francis, Tata McGraw Hill Co, New Delhi.**
- 2. Investment Management, J.Fabozzi, Frank, Prentice Hall, New Delhi.**
- 3. Portfolio Management, S.Kevin, Prentice Hall, New Delhi.**

II B.COM IV SEMESTER Major Elective(1Course)(Any One)

4. Office Automation

Unit – I Introduction to Office

Introduction to Office 2000- Opening and closing office programs –Microsoft Office –Shortcut Keys-tool bars-Customizing Office Application-Files and Folders-Configuring printers-Installation programs.

UNIT- II Ms-Word

Creating a document – Copying and moving text – Formatting the document (Font, Paragraph, Bullets & Numbering, Page Setup). Inserting Page breaks – Page Numbers – Margin – Application of Header & Footer. Creating Tables – Entering Text – Formatting table – Using Formulas. Mail Merge – Letter – label – Envelope

UNIT-III Ms-Excel

Introduction to electronic Spread sheet-excel 2000. Basics creating and saving a workbook-entering data into work sheet within (manual-Automatic)-basic formatting-Basic Excel function-Chart [various types].

UNIT-IV Ms- PowerPoint

-Create a new presentation using Blank presentation – Formatting text and applying designs and background of slide. Create a new presentation using Templates – Apply Custom animation, Slide Transition, Sound effect – View show. Create a new presentation using Auto Content Wizard .

UNIT-V Ms- Access and Tables

Creating a New Blank databases - Creating table – Field size – Caption – Data types - Indexed Unicode – Compression – Decimal places. Modifying Tables - Modifying Field Property.

Text Book:

Office 2000:the complete reference ,stepen L.Nelson

Reference:

1. **Vikas Gupta, Comdex Computer Course Kit (XP Edition), Dreamtech publish, Delhi**
2. **Fndamentals of computing C Programming and MS office,Alexis Leon ,Mathews Leon,Chitra,jeyarai,Vijay Nicole Private Limited**

II B.COM IV SEMESTER OFFICE AUTOMATION-PRACTICAL

MS Word

a. Text Manipulation

**Changing the font size and type
Aligning and justification of text
Underlining the text
Indenting the text**

- i. Prepare a Bio-data**
- ii. Prepare a Letter**

b. Usage of numbering, bullets, footer and headers

- i. Prepare a document and Auto format**
- ii. Prepare a document with built , footers and headers**

c. Tables and Manipulations

- i. Create a Calender and auto format**
- ii. Create a Marksheet-using table**
- iii. Picture insertion and alignment**

d. Mail Merge Application

M.S Excel

- i. creating and saving Excel sheet**
- ii. Usage of formulas and built-in functions**
- ii. Describe the type of function**

- iii. **Data Sorting**
- iv. **Mark sheet preparation**
- v. **Inserting Chart**

M.S Power point

- i. **Creating and saving Presentation**
- ii. **Prepare a presentation of your own**

M.S Access

- i. **Creating database of your own**
- ii. **Modify table content in database**

II B.COM IV SEMESTER Allied Subject-II (1Course)

E-COMMERCE

UNIT-I:

E-Business and E-Commerce: Introduction, Potential Benefits, Limitations, Classifications, Impact of E-Commerce on Business models

E-Commerce Applications: Entertainment, E-Marketing, E-Advertising, Search Engines, E-Banking, Mobile Commerce, Online Trading, ELearning, E-Shopping.

UNIT-II:

Architecture Framework of E-Commerce: Application Services, Brokerage and Data Management, Interface layers, secure messaging, Middleware services and network infrastructure.

Security Protocols: Open systems interconnection (OSI), TCP/IP, FTP, HTTP, SMTP, S-HTTP, SSL, NNTP, Messaging Protocols: Basic Mail Protocol, Security Enhanced Mail Protocol.

Web Security Issues, Encryption Techniques: Symmetric and Asymmetric.

UNIT-III:

Consumer Oriented E-Commerce Applications, Mercantile Process Model:

Consumers Perspective and Merchant's Perspective

Electronic Payment Systems: Advantages and risks, Types of Payment

System (Credit Cards, E-Cash, Smart-Cards)

UNIT-IV:

Electronic Data Interchange: Non EDI System, Partial EDI System, Fully

Integrated EDI System, Prerequisites for EDI

Issues of EDI: Legal issues, Security issues, Privacy issues.

UNIT-V: E-Marketing Techniques: Search Engines, Directories, Registrations, Solicited targeted E-mails, Interactive sites, Banners, Advertising, Spam Mails, E-mail, Chain letters. Applications of 5P's (Product, Price, Place, Promotion, People), EAdvertising Techniques: Banners, Sponsorships, Portals, and Online Coupons.

TEXT and Reference Book

1. E-Commerce: A Managerial Perspective: Micheal change, etc. A1

2. Electronic Commerce – Security: Greenstein &Feinman Risk Management & Control

3. Frontiers of Electronic Commerce: Ravi Kalakota & A.B. Whinston.

III B.Com – V Semester Part III Core Subjects (3 Courses)

CORE 1 Corporate Accounting I

Unit -1

Issue of shares-issue at par, premium and discount- calls in arrears- calls in advance-Forfeiture and reissue of shares-Prorata allotment- redemption of preference shares-issue of Bonus shares.

Unit II

Issue of debentures - redemption of debentures- sinking fund method-Underwriting of shares.

Unit III

Profit prior to incorporation – alteration of share capital and internal reconstruction-Accounting entries.

Unit IV

Valuation of goodwill and shares- various methods of valuation of goodwill and shares.

Unit V

Amalgamation, absorption, and external reconstruction- calculation of purchase consideration – In the books of Vendor and purchaser.

Text &Reference Books

- 1) **Advanced Accountancy -S.P.Jain&K.L.Narang-Kalyani Publishers , New Delhi.**
- 2) **Advanced Accountancy-R.L.Gupta and M.Radhaswamy-Sultan Chand&Sons, NewDelhi.**
- 3) **Advanced Accountancy-M.C.Shukla and T,S.Grewal- Sultan Chand&&Co,New Delhi.**
- 4) **Advanced Accountancy-Dr.M.A.Arulanandam&K.S.Raman –Himalaya Publishing House,Mumbai.**
- 5) **Advanced Accountancy.S.P.Jain &K.L.Narang.Kalyani Publishers.NBew Delhi**

III B.Com – V Semester Part III Core Subject

CORE 2 Cost Accounting

Unit I

Cost accounting-Nature- Meaning – Features and importance limitation of financial accounting-advantages and limitation of cost accounting – costing system-cost centre- cost unit- elements of cost- cost classification – cost sheet.

Unit II

Materials –objectives- purchase control- centralized and decentralized purchase – stock levels and EOQ-ABC Analysis-Bin card- stores ledger- Material issue – FIFO,LIFO, Average and weighted average methods

Unit –III

Labour- Direct and indirect labour – methods of wage payments- remuneration and incentives – premium and bonus plans- Idle time- over time- labour turnover.

Unit IV

Overhead- Meaning- classification- allocation and apportionment of overheads- re apportionment of over heads-absorption of over head- methods- machine hour rate.

Unit V

Job costing (simple problems only) – process costing –features- process losses and gains.

Text Books

1.Cost Accounting”S.P.Jain and Narang-.Kalyani Publishers.

2.Cost Accounting.S.P.Iyengar.Sultan Chand &Sons.New Delhi

Reference books

Das Guptha: Sultan Chand & Sons. New Delhi

Cost Accounting..RSN .Pillai: Sultan Chand & Sons. New Delhi

Cost Accounting:M.L.Agarwal.Sahitya Bhavan Publications

**Cost Management, Accounting and Control:Hansen ,Mowen-Thompson
Publication**

**Cost Accounting:S.Polimeni,A.Handy.A.Kasmin,Schaum's-Outlines,Tata
Macgrw Hill Edition**

Cost Accounting:An Introduction.B.LM.Lal Nigam.I.C.Jain-Prentice Hall

Cost Accounting:Jawaharlal, Tata Macgrw Hill Edition

III B.Com – V Semester Part III Core Subject

CORE 3 Business Law

Unit I

**Indian contract Act 1872-Fundamental essential of a valid contract-
classification of contract- offer acceptance- consideration- capacity-free
consent – legality of object – contingent contracts.**

Unit II

**Performance of contract- discharge of contract- breach of contract- remedies-
Quasi contracts.**

Unit III

Special contracts- Indemnity – Guarantee

Unit IV

Bailment – pledge- contract of agency.

Unit V

Sale of Goods Act- Difference between sale and agreement to sell- sale and hire purchase agreement- classification of goods-documents of title to goods- Rights and duties of buyers and sellers – Rights of unpaid seller.

Text books

- 1. Business law- N.D.Kapoor**
- 2. Element of Mercantile Law- N.D.Kapoor,sultanchand& sons**
- 3. Business Law-P.C.Tulsian, Tata McGraw- Hill station.**
- 4. Business Law-R.S.N.Pillai, Bagavathy- S.Chand&Co,New Delhi.**

Reference Books:

- 1. Business and Corporate Law- P.C.Tulsian, Tata McGraw- Hill station.**
- 2. Business Law including Company Law- S.S.Gulshan, G.K.Kapoor- New age International Pvt Ltd, New Delhi.**

III B.Com – V Semester Part III Major Elective (1Course)(Any One)

1 .Income tax law and practice –I

Unit I

Basic concepts – Person, assessee, previous and assessment year, total income, gross total income – concept of income – Agricultural Income- Income exempted from tax – Residential Status- problems.

Unit II

Income from salary –different forms of salary and allowance – perquisites – problems in computation of salary income.

Unit- III

Income from House property – Annual value – Standard deduction– Unrealized rent – problems in computation of house property income.

Unit –IV

Income from under the Head – Business or profession – deduction allowable – Expressly disallowed expenses – computations – problems in computation of business or professional income.

Unit – V

Income from capital gain - Types - Exemption- Computation- problems in computation of capital gain.

Text Book for reference

- 1. Income tax law and accounts- Dr.H.C.Mehrotra and Dr.P.Mehrotra**
- 2. Income tax law and practice - V.P Gaur, D.B Narang, PoojaGhai and Rajeev Puri.**

III B.Com – V Semester Part III Major Elective (1Course)(Any One)

2 Application of TALLY in Accounting

UNIT 1: Introduction to Tally, company and Accounting Information Menu
Tally features – Technological advantages of tally accounting software – tally screen components – Gateway of Tally – company information menu – creating a company – Accounting information menu – concept of groups in Tally-Managing and operating groups – Managing and operating Ledgers

UNIT II: Managing and Operating vouchers

Meaning of voucher – predefined voucher in tally, Accounting vouchers, Inventory vouchers and unconventional vouchers – Entering transaction in vouchers

**UNIT III: Managing and Operating Inventory Information Menu F11
Features-F12 Configuration –Stock items, Units of measure, Stock groups,
stock categories, Godown, price list, inventory vouchers**

UNIT IV: Tally Reports

**Reports which can be accessed from gateway of Tally under “Reports,
Reports which can be accessed through the menu “Display” under report –
Export and import of data – printing reports- Tally ODBC**

UNIT V: Tally Advanced Financial Management and Control

**Preparation of Bank Reconciliation Statement, Fund Flow Statement, Branch
Accounting, Flexible period accounting, Budgeting and Control, Variance
Analysis and Ratio Analysis**

Reference Books

- 1.Tally User Manual, Tally Solutions (p) Limited**
- 2.Tally- Nadani**
- 3.Tally – NamrataAgrawal**

III B.Com – V Semester Part III +Application of TALLY in Accounting

List of Practical

Answer any ONE question

- 1. Create an ‘Accounts With Inventory Company’ by Activating the necessary F11 company features-Change the address of the company – Convert it into ‘Account only Company’-Delete the Created Company**
- 2. Operating of necessary ledger account from the given Trial balance and prepare Final accounts**
- 3. Accounting voucher posting from the given transaction and Display of Day Book and alteration in Day Book**
- 4. Accounting voucher posting for the given transaction and preparation of final accounts with adjustments**
- 5. Create necessary Stock Group, Stock Item and Units of Measure, Godown and making inventory voucher posting and Display the Stock Summary and Individual Stock Item Report**

III B.Com – V Semester Part III Major Elective (1Course)(Any One)

3 Logistics management

Unit I

Logistics- meanings- importance-logistics competency- logistical mission – service- total-cost- logistical renaissance- technological advancement- regulatory change- IT Revolution- TQM Initiatives.

Unit II

Work of logistics- -network design- information- transportation and Inventory- warehousing – material handling- packaging- integrated logistics- Inventory flow – Information flow.

Unit III

Operating objectives- rapid response- minimum variance –minimum inventory –movement consideration- quality- life cycle support- barriers to internal integration in organizational structure – measurement system- inventory ownership – information technology- knowledge transfer capacity.

Unit IV

Information functionality- and inventory functionality- principles of logistics information- information architecture-planning –operations- logistics information flow – application of new information technologies – electronic data interchange standards- inventory functionality- inventory types- characteristics- cost of carrying inventory- determining order point-lot size- accommodation uncertainty- replenishing ordering and ware housing management.

Unit V

Transportation infrastructure- transport functionality- principles- modal classification- transportation formats- suppliers of transportation services- storage functionality- principles –concept of strategic storage – developing warehouse resource- warehouse strategy

Text books

Logistical management (Integrated supply chain process-by Donald J. Bowersox, David J. Closs- Tata Mcgraw –Hill edition

**III B.Com – V Semester Part III Common skilled based
subjects(1Course)(Any One)**

1. Effective Communication

Common skilled based subjects(1Course)(Any One)

2. Personality Development

III B.Com – VI Semester Part III Core Subjects – 4

(With effect from the academic year 2012-2013)

CORE 1

1. Corporate Accounting-II

2. Unit –I

Liquidators' final statement- contributory.

Unit –II

Holding companies- minority interest- capital profits- cost of control or goodwill- preparation of consolidated balance sheet.

Unit –III

Banking companies-Format of balance sheet and profit and loss account as per sec 29 of Banking Regulation Act.

Unit – IV

Double account system- meaning-difference between double account and single account system- difference between double account- and double entry system-preparation of final accounts- capital base disposal of surplus- calculation of reasonable return- replacement of assets.

Unit V

Accounting ratios- responsibility accounts- human resource accounting.

Text & Reference Books

- 1) **Advanced Accountancy -S.P.Jain&K.L.Narang-Kalyani Publishers , New Delhi.**
- 2) **Advanced Accountancy-R.L.Gupta and M.Radhaswamy-Sultan Chand&Sons, NewDelhi.**
- 3) **Advanced Accountancy-M.C.Shukla and T,S.Grewal- Sultan Chand&&Co,New Delhi.**
- 4) **Advanced Accountancy-Dr.M.A.Arulanandam&K.S.Raman –Himalaya Publishing House,Mumbai.**
- 5) **Advanced Accountancy.S.P.Jain &K.L.Narang.Kalyani Publishers.NBew Delhi**

III B.Com – VI Semester Part III Core Subject

CORE 2 Management Accounting

Unit I

Management accounting- Definition- Objectives- Nature,scope,function- management accounting Vs financial accountion-Management Accounting vs cost accounting- advantages-limitations of management accounting.

Unit II

Fund flow and cash flow analysis- meaning –Difference between fund flow statement and cash flow statement- funds- preparation of fund flow statement and cash flow statement.

Unit III

Marginal costing –meaning- features-assumption- contribution P\|V Ratio- CVPanalysis-Break even analysis-Assumption- Advantages – limitations- margin of safety.

Unit IV

Standard costing- meaning of standard cost and standard costing standard costing and budgetary control- Advantages and limitations- analysis of variance- Direct material, direct labour and overhead.

Unit V

Budget and budgetary control- meaning of budget , budgeting and budgetary control- objectives- features- advantages –limitations- flexible budget- cash budget- production budget – purchase budget – sales budget.

Text books:

- 1. Management accounting S.M. Maheswari sultan chand and sons.**
- 2. Management accounting.R.S.N.Pillai&Bhawathi ,S.Chand&co**

III B.Com – VI Semester Part III Core Subject

Core 3 Industrial Law

Unit I

The factories Act 1948 – Definitions– approval, licensing and Registration of Factories – duties of occupier – Inspection staff- certifying surgeons- provisions for health- safety- welfare- working hours and holidays- employment of young persons and women- Annual leave with wages- penalties and procedure.

Unit II

Workmen's compensation Act 1923 – scope and coverage- definitions- rules- personal injury by accident- occupational disease- arising out of and in the course of employment – theory of notional extension- amount of compensation- distribution of the compensation- notice and claim.

Unit III

Industrial disputes Act 1947 –object- definitions- conciliation machinery – adjudication machinery- powers and duties of authorities- procedures- voluntary reference to arbitration – award- strikes and lock outs-lay off- retrenchment- transfer and closing down of the undertaking – penalties.

Unit IV

The Trade Unions Act 1926- The payment of bonus Act 1965.

Unit V

The Employees state insurance act 1948,- The Payment of Gratuity Act 1972

Text books

Elements of Mercantile Law-N.D.KAPOOR, Sultan chand&sons

Business and corporate law – p.c. tylian , Tata McGraw- Hill edition

III B.Com – VISEmester Part III

CORE 4

Auditing

Unit I

Introduction- meaning- objectives – difference between Accountancy and auditing – advantages- limitations- Audit programme- Auditing working papers- preliminaries before audit – test checking and routine checking.

Unit II

Internal check – meaning- objectives- difference between internal control and internal Audit- Advantages and disadvantages of internal check-internal check regarding cash, purchases, purchase returns, sales and sales returns.

Unit III

vouching – meaning- objects- importance of vouchers- precautions to be taken by the auditors while examining vouchers – vouching of various transactions.

Unit IV

Verification of assets and liabilities – meaning- classification of assets- verification of different types of assets- verification of liabilities.

Unit V

Company auditor- appointment- qualification and disqualification removal of auditor- status- rights – duties- and liabilities- auditors report content- kinds of auditor’s report- general considerations for drafting report.

Text book

- 1. Auditing B.N.TandonS.Chand&co, new delhi.**
- 2. Auditing Dr.T.R.Sharma, Sahitya publication, Agra**

Reference Books:

- 1. Principles and Practice of Auditing- DinkarPagare, Sultan Chand& Sons, New Delhi.**
- 2. Text book of Auditing- Saxana, Reddy and Appannaiah, Himalaya Publishing House**

III B.Com – V I Semester Part III Major Elective(1Course)(Any One)

1. Income tax law and practice-II

Unit I

Income under the head-other sources-Computation –Problems.

Unit II

Set off and carry forward of losses. Deductions from Gross total Income Problems.

Unit III

Procedures for Assessment – Returns – Types of returns-Types of Assessment- Tax Deducted at source.

Unit IV

Assessment of Individual- Problems including computation of tax

Unit V

Assessment of firm-Problems including Section 40(b) application.

Text Book for reference

- 1. Income tax law and accounts- Dr.H.C.Mehrotra and Dr.P.Mehrotra**
- 2. Income tax law and practice - V.P Gaur, D.B Narang, PoojaGhai and Rajeev Puri.**

III B.Com – V I Semester Part III Major Elective (1Course)(Any One)

2. INTRODUCTION TO RDBMS

Unit-I:Introduction to Data Base Management Systems

Definition and Quality of Information-Information Processing-File Based Data Management and its Disadvantages-Meaning and advantages of Database System-Organisation of Database and Characteristics of Database-Meaning and Functions of a Database Management System-components of a DBMS.

Unit-II-Data Models

Basic understanding of Hierarchical Model,NetworkModel,Relational Model-Entity-Relationship model,Object-Oriented Model-Advantages and disadvantages of various data Model-Components of E-R Model-Entities,Attributes and Relationships-Relational DatabaseMangement System-RDBMS Terminology-codd's Rule-Relational Data Integrity and Database Constraints.

Unit-III-Structured Query Language(SQL)

Introduction to Oracle9ii-Features of Oracle-Overview of SQL-SQL *plus Environment-Types of SQL Statements-DDL, DML, DQL, DCL and TCS Statements-SQL Operators-Tables, Views and Indexes-Creating, Modifying and deleting Table-creating Views, Data Query and Manipulation Operations with views and Check options-Why users and Index,creating and Dropping index-Unique key-Primary key-Foreign key-check constraints-INSERT, UPDATE and DELETE Operations.

Unit-IV-Queries and Subqueries

Retrieving data from database tables-Using the SELECT statement-using the WHERE clause, GROUP By clause, HAVING clause and ORDER By clause- Qualified Retrieval-Using DISTINCT, IN, BETWEEN, LIKE, ESCAPE clause-Grouping while selecting-Ordering while selecting- Subquery and execution-Nested Subquery-parallel subqueries -Correlated subqueries- Aggregate functions provided by SQL-Joins and unions operations.

Unit-V-Database Security

Data Security Risks-Dimensions of Database security-Data Security Requirements-Protecting the data within the Database: Database privileges, Roles and its properties- Granting and Revoking and Revoking privileges and Roles – GRANT and REVOKE Command-Database Users: Database users-database Administrators, Database Designers, End users-Casual End users, Naïve or Parametric End users, Sophisticated End users and Standalone end-users

References:

1. **David Maier: The Theory of Relational Databases, Computer Science Press, Rockville,MD,**
2. **Database system concepts, A.Silberschatz, H.F.Korth, S.Sudarshan, McGraw-Hill**
3. **T.Hawryszkiewicz, Database Analysis and Design, Science Research Associates Chicago, Illinois**
4. **Essentials of Database Management Systems, Alexis Leon and Mathews Leon,Vijay Nicole Imprints (P) Ltd, Chennai.**

Introduction to RDBMS**List of Practicals**

Choose any TWO Questions

1. **Retrieving data from table using SELECT statement.**
2. **Qualified Retrieval using DISTINCT, IN, BETWEEN and LIKE**
3. **Grouping and Ordering while Selecting**
4. **Complex select statement using AND, OR and NOT**
5. **Execution of Sub query**
6. **Nested Sub query**
7. **Aggregate functions-SUM(), COUNT() and COUNT(*), MAX()and MIN**
8. **INSERT, UPDATE and DELETE Operations**
9. **Join between Tables**
10. **Union operations**
11. **Adding and dropping a column**
12. **Insert, update and delete operations**

III B.Com – VI Semester Part III Major Elective(1Course)(Any One)

3. RETAIL MANAGEMENT

Unit I:

Introduction to retailing-nature and importance of retailing-contemporary retailing in India and marketing challenges facing retailers-Strategic planning in retailing-owning or managing a Business-Wheels of retailing-retailing life cycle

Unit II:

Types of retailing institutions-retailing institutions by ownership-retailing institutions by store based and non-store based-vertical marketing system-Traditional retailing.

Unit III:

Strategic planning in retailing-understanding retailing environment-identifying and understanding customers, information gathering, designing retail information system- processing of information system and research.

Unit IV:

Location and organizational decisions-Trading area analysis site selection - organizational pattern in retailing- operational management-financial decisions- use of technology.

Unit V:

Merchandise Management-Buying and handling- product assortment decision- Inventory Management- Merchandise pricing- Merchandise Labeling and packing- Retail promotion- Retail promotion strategy- Building retail store image- Role of atmosphere- retail promotion mix strategy- retail store sales promotion schemes.

Text Book:

1. Retailmanagement, Michael Levy and Barton A Weot, McGraw Hill Irwin,

Reference Books:

- 1. Retail management A Strategic Approach, Berman, Barry and Jeol R Evans, Prentice Hall, New Jersey.**
- 2. Retail management, Cox, Roger and Paul Brittain, Prentice Hall, Harlow.**
- 3. Retailing Management-By Michael Levy, Barton A Weitz, Ajay Pandit-McGraw-Hill.Com Company.**

NB.

- 1. For Effective Communication and Personality Development the university will sent the common syllabus.**
- 2. To develop industrial skills among students Educational tour / Industrial Visit can be arranged**

APPENDIX – AZ36**MANONMANIAM SUNDARANAR UNIVERSITY****TIRUNELVELI****CHOICE BASED CREDIT SYSTEM****REVISED COURSE STRUCTURE FOR B.COM WITH
COMPUTER APPLICATION (III SEMESTER TO VI SEMESTER)****For those who joined the course during 2012-2013 and afterwards****III Semester**

Components	Hours	Credits
Part-III- Core Subjects (3 Courses)		
1.Advanced Financial Accounting I	6	4
2 Business Mathematics	6	4
3 Modern Banking	6	4
Skill Based Subjects (Allied Related) (1 Course) (Any One)		
1.Introduction to HTML	4	4
2.Internet with Web Designing		
Non-Major Elective (1 Course) (Any One)		
1. Fundamentals of Computer technology	2	2
2. Internet Applications		
Allied Subject-II (1 Course)		
PAGEMAKER and PHOTOSHOP(theory 4 hours, practicals2 hours)	6	5
Total (6 Courses)	30	23

IV Semester

Components	Hours	Credits
Part-III Core Subjects (2 Courses)		
1. Advanced Financial Accounting II	6	4
2. Business Statistics	6	4
Skill based Subject (Allied related) (1 Course) (Any One)		
1.Introduction to DBMS	4	4
2.Net works Management		
Non-major Elective (1 Course) (Any One)		
1.Fundamentals of Computer organisation	2	2
2. E-Commerce		
Major Elective (1 Course) (Any One)		
1. Operating system		
2. Indirect Tax	6	5
3.Investment Management		
Allied Subject-II (1 Course)		
1.CROWALDRAW with Applications (theory 4hours, practicals 2 hours)	6	5
Part –V Extension Activity (NCC, NSS,YRC, YWF)		1
Total (6 Courses)	30	25

III.B.Com-V Semester

Components	Hours	Credits
Part-III- Core Subjects (3 Courses)		
1.Corporate Accounting I	7	5
2.Cost Accounting	7	5
3.Business Law	6	6
Major Elective (1 Course) (Any One)		
1.Application of TALLY in ACCOUNTING(theory 4hours,practicals 2 hours)	6	5
2. Income Tax ,Law & Practice I		
3. Logistics Management		
Common Skilled based Subject (1 Course) Any One		
1. Effective Communication	4	4
2.Personality Development		
Total (5 Courses)	30	25

III B.Com-VI Semester

Components	Hours	Credits
Part-III- Core Subjects (4 Courses)		
1. Corporate Accounting II	6	5
2 Management Accounting	6	5
3. Industrial Law	6	5
4. Auditing	6	5
Major Elective (1Course) (Any One)		
1. MULTIMEDIA WITH APPLICATION (theory 4 hours, practicals 2 hours)		
2. Retail Management	6	5
3. Income Tax, Law & Practice II		
Total (5 courses)	30	25

B.COM WITH COMPUTER APPLICATION – SYLLABUS UNDER CBCS

(For those who joined the course from the academic year 2012-2013 onwards)

II B.Com with Computer Application – III Semester Part III Core Subjects- (3 courses)

CORE –I - ADVANCED FINANCIAL ACCOUNTING I

Unit – I

Branch accounting – Meaning-Types of Branches-Debtor’s system - Invoice price Method (excluding stock and debtors system)

Unit - II

Departmental accounts- Meaning – Difference between branch and department accounts- Departmental trading and profit and loss accounts- Basis for allocation of expenses- Departmental transfer at invoice price

Unit III

Hire purchase and installment system-Calculation of cash price and interest-Default and Repossession.- difference between Hire purchase and Installment system-interest suspense account

Unit - IV

Royalty account-Meaning-Minimum rent-Short working- Types of recoupment – strike and lockout.

Unit – V

Insolvency accounts- insolvency of an individual- statement of affairs-Deficiency account.

Theory: 40 marks; Problem: 60 marks

Text Books and References

Advanced accountancy- volume -1 by. T.S. Reddy & MURTHY , MARGHAM publications, Chennai

Advanced Accountancy- By M.C.Shukla&T.S.Grewal-S.Chand&Co,New Delhi.

Advanced Accountancy- By M.A.Arulanandan&K.S.Raman-Himalaya Publishing House,Mumbai.

Accountancy- By P.C.Tulsian, Tata McGraw-Hill edition

Accountancy – By S.P. Jain&K.L. Narang, kalyanipublishers,new delhi.

II B.Com with Computer Application – III Semester Part III

Core - 2:

BUSINESS MATHEMATICS

Unit- I

Number systems and equations: counting techniques

Binominal expansion numbers- natural-whole – rational- irrational – real- algebraic expression – factorization-equations-linear – quadratic- solutions- simultaneous linear equations with two or three unknowns- solutions of quadratic equations- Nature of the roots- forming quadratic equation – permutation- combinations – binomial expansion.

Unit –II

Theory of indices – logarithms and progression indices positive indices- zero and negative indices- fractional indices. Logarithms- properties- laws of logarithms- common logarithms. Arithmetic progression n'th term – sum of terms

Unit –III

Analytical geometry: distance between two points in a plane slope of a straight line – equation of straight line – point of intersection of two lines – applications (1) demand and supply (2) cost-output (3) break-even analysis.

Unit –IV

Matrices – basic concepts- matrix addition- scalar multiplication – multiplication of matrix- inverses of a matrix- solution of a system of linear equations- matrix method.

Unit – V

Commercial arithmetic percentages – ratio and proportion – simple interest- compound interest- annuities- depreciation – discount-banker’s discount true discount – amortization.

Theory: 40 marks

Problem:60marks

Text Books and References

**Business mathematics D.S Sancheti&V.K.Kapoor, sulthan Chand and sons
New Delhi**

**A text book of Business Mathematics by G.K. Ranganath- Himalaya
Publishing House, Delhi.**

Business Mathematics- D.C.Sanchetti&B.M.Agarwal.

II B.Com with Computer Application– III Semester Part II Core Subject

CORE 3: MODERN BANKING

UNIT –I

Banking system

Indigenous bankers – commercial banks –co-operative banks- land development Banks-Industrial Development bank-NABARD –E XIM Banks- Foreign Exchange banks- central bank- RBI Vs SBI

UNIT II

Central Banking:

Central bank of india-functions –methods of credit control- traditional and promotional functions – RBI’S monetary policy – opening of new branches – new licensing policy.

UNIT III

Banker and customer

Banker –customer – Relationship between banker and customer- General and special relationship – rights of the banker – cheque: Meaning- essentials of valid cheque- crossing: Definition- types of crossing-endorsement- Types- material alteration- Statutory protection to the paying banker- Statutory protection to the collecting banker.

UNIT IV

Core banking – Home Banking – Retail Banking – Internet banking: Online banking and offline banking – mobile banking-Computerised Banking – Electronic Funds Transfer- ATM and Debit Card – Smart Card – Credit

Card – E-Cash- Swift – RTGS– Impact of Technology – Global Developments in Banking Technology.

UNIT V

Modernized banking

Traditional vs E- Banking transactions- Electronic delivery channels- Advantages of e- Banking – constraints in e-Banking security measures.

Text Books and References

Banking theory law and practice- K.C Sherlekar

Banking theory law and practice-S.N.Lal

Banking theory law and practice-M.C Tannen

Banking theory law and practice-E.Gordon and K.Natarajan

Banking theory law and practice-S.S Gulshan and GulshanK.Kapoor

Skill Based Subject (One Course – any one)

1. INTRODUCTION TO HTML

UNIT I

Introduction to Internet: Computers in business-Network-Internet-Electronic mail-Resource sharing-Gopher-WWW-Usenet-Telnet-Bulletin Services-Wide Area Information Service. Internet browsers: internet Explorer-Netscape Navigator.

UNIT II

Introduction to HTML: Designing a Home page-History of HTML-HTML generations-HTML Documents –Anchor tag-Hyperlinks-Sample HTML Documents .

Head and Body section: Header section-Title-Prologue-Links-Colorful Web page –Comments lines-Designing the body: Heading printing-Aligning the Headings –Horizontal rule-paragraph-Tab Settings-Image and pictures-Embedding PNG format images.

UNIT III

Ordered and unordered lists: List-Unordered lists-headings in a list-Nested lists.-Table handling: Tables-table creations in HTML-Width of the table and cells-Cells spanning multiple rows / columns-coloring cells –column specification.

UNIT IV

DHTML and Style sheets: Defining styles-Elements of styles-Linking a style sheet to an HTML document-Inline styles-Internal & External style sheets-Multiple styles.

UNIT V

Forms: Action attributes-Method attributes-Ectype attributes-Drop down list.

Text and Reference books:

- 1) world wide web design with HTML,c.xavier,TMH,2001.**
- 2) Fundamentals of information technology, Mathew's Lenon and Alxis Leon, Vijay Nicole private limited, Chennai.**

Skill Based Subject (One Course-Any One)

2. INTERNET with WEB DESIGNING

Subject Description: This course aids the learner to know the working of Internet, uses of search engines and procedure to develop a web page.

Goals: To make the students expert in creating Web Page

Objectives: After the successful completion of the course the student must know the concepts of Internet and design a Web Page.

UNIT – I

Introduction to Internet - Internet Access / Dial-Up Connection – Internet Services’ Features – TCP/IP Vs Shell Accounts – Configuring the Machine for TCP/IP Account – Configuring the Shell Account –Telnet – Changing the Password – World Wide Web (WWW) - Web Page – Hyper Text – HTMLTags – Net Surfing - Internet/Web Browsing - Browser – Internet Addressing – IP Address –Domain Name – Electronic Mail – Uniform Resource Locator (URL) – Internet Protocols –TCP/IP –FTP – HTTP – Telnet – Gopher – WAIS.

UNIT – II

Searching the Web – Web Index – Web Search Engine – Web Meta – Searcher – Search Functions –Search Engines – Meta Search Sites – Directories and Indexes – Specialized Directories – Electronic Mail (E-Mail) – E-Mail Message – Customizing E-Mail Programs – Managing Mails – Zen of ‘Emailing’– Address Book – Signature Feature – File Attachment Facility – Setting priority –Advantages and Disadvantages of E-Mail.

UNIT – III

Introduction to HTML – HTML Code for a Web Page – Web Page Basics – Set up a Web Page – Display a Web Page in a Web Browser – Start a New Paragraph – Start a New Line – Insert Blank Spaces – Heading – Pre-format Text – Comment – Special Characters – Format Text – Emphasize – Superscript and Subscript – Font Style and Size – Color – Margins – Mono Spaced Font – Block Quote – Lists – Ordered List – Unordered List – Nested List.

UNIT – IV

Links - Link to another Web Page – Link within a Web Page – Link to an Image – Link to a File – Email Link – Link to an FTP Site – Change Link Colors – Create Keyboard Shortcuts – Change the Tab Order – Tables – Create a Table – Add a Border – Caption – Column Groups – Row Groups – Color – Background Images – Aligning Data – Size of a Table – Size of a Cell – Span Cells – Cell Spacing and Cell Padding – Borders – Text Wrapping – Nested Tables – Wrap Text around a Table.

UNIT – V

Sounds and Videos – Link to a Sound – Sound Considerations – Embedded Sound – Extended Video – Video Considerations – Internal Video – Introduction to Forms – Set up a Form – Text Box – Large Text Area – Check Boxes – Radio Buttons – Menu – Upload Files – Submit and Reset Button – Hidden Field – Organize Form Elements – Label Form Elements – Introduction to Frames – Creating Frames – Frame Considerations – Provide

**Alternative Information – Link to a Frame - Scroll Bars – Resizing Frames–
Frame Borders – Frame Margins – Nested Framesets – Inline Frame.**

Books for Reference:

- 1. Alexis Leon & Mathews Leon, “Internet for Everyone”, Leon Tech World, Chennai.**
- 2. Eric Kramer, “HTML”.**
- 3. Kamalesh N. Agarwala, Amit Lal & Deeksha Agarwala, “Business of the Net”.**
- 4. John Zabour, Jeff Foust & David Kerven, “HTML 4 HOW- TO”.**

Non-Major Elective (One Course)

1. FUNDAMENTALS OF COMPUTER TECHNOLOGY

UNIT 1:

Information Technology Basics: Introduction, Information, Technology, Information Technology, Present Scenario, Role of Information Technology, information technology and Internet, careers in IT industry.

UNIT II

Computer Memory and Storage: Introduction, Memory hierarchy, Random Access memory (RAM), Read Only Memory (ROM). Types of Secondary storage device, Magnetic tape, magnetic disk, type of magnetic disk, optical disk, type of optical disks.

UNIT III

Multimedia Essentials: Introduction Multimedia: definition, Building blocks of multimedia, multimedia system, multimedia applications.

The Internet: Introduction, Evolution of Internet-Basic Internet terms-Getting connected to Internet-Internet Applications-Data over Internet.

UNIT IV

Internet Tools: Introduction-Web Browser-Browsing Internet using Internet Explorer-Email-search engines-Instant messaging.

UNIT V

Emerging trends in IT: Introduction , Electronic Data Interchange-Mobile communication-Bluetooth-Global Positioning system-Infrared communication-smart card-imminent Technology.

TEXT BOOK:

Introduction to Computer and Information Technology, D. Glory Ratna Mary, S. Selvanayahi, V. Joseph Peter, Shekina Publications.

REFERENCE BOOKS:

Introduction to Information technology IITL Education Solutions Limited, Pearson Education.

Fundamentals of Information Technology by Alexis Leon & Mathews Leon Vikas Publication-New Delhi.

2. INTERNET APPLICATIONS

UNIT I

Data communication - Computer networking basics – LAN Teach Data communication - Computer networking basics - LAN Technology and networking Topology - WAN Technology and routing - protocols and layering - Networking Devices.

UNIT II

Meaning of internet, Intranet and Extranet – Evolution of internet – Important features of Internet – Brief description about Web Server, web Browser and (WWW), Search Engines.

UNIT III

Internet Addressing: Standard Internet Addresses – Top Level Domains – Pseudo – Internet Address – IP Addresses and DNS – Mail: SMTP – Signatures – Mail Addresses –Sending and Receiving mail – How mail is stored? Text and Binary data – Understanding the web : Links –URLs – web page – Home Page

UNIT IV

E-Mail-Description of E-Mail address and Message format – File Transfer Protocol World Wide Web- Usenet-IP-telephony-Frequently Asked Questions (FAQ), Internet Relay Chat (IRC) and Instant Messaging

UNIT V

E-Mail-Description of E-Mail address and Message format – File Transfer Protocol World Wide Web- Usenet-IP-telephony-Frequently Asked Questions (FAQ), Internet Relay Chat (IRC) and Instant Messaging

TEXT AND REFERENCE BOOKS:

1. Sanjay Saxsena, “A First Course in Computer”, Vikas Publishing House, 2000.
2. Fundamentals of the Internet and World Wide Web by Green law and Hepp, TMH Publication

PART III-Allied Subject II (One Course)

1. PAGE MAKER AND PHOTOSHOP

Aim:

The aim of the paper to gain fundamental knowledge about computer designs for Page maker and Photoshop

Objective:

- To know the basic things about the design
- To know the working process of Photoshop Applica

PAGE MAKER AND PHOTOSHOP

UNIT – I

Introduction to DTP – Exploring common features in PageMaker, Working with files and folders, Saving, Moving and Copying, Renaming, Deleting- Editing in PageMaker: PageMaker window, creating- closing publications, Editing text-Formatting text.

UNIT - II

Master Pages- placing elements on Master Page-placing Guidelines, placing header and page number, creating Master Page –removing Master Page – editing Master Page – creating columns.

UNIT – III

Working with Graphics and objects: Tool Bar, Placing graphic on the page, importing graphic, resizing a graphic, moving a graphics, cropping a graphic, grouping and ungrouping-Managing and printing- page-orientation-numbering-page size- dimensions-margins- table of content-Managing books.

UNIT – IV

Starting with Photoshop – program window, working with images-rotating, cropping, revealing the hidden image, freehand; Making Selection-selection tool, lasso tool, copying, filling, transforming- painting tools- Drawing tools - retouching tools

UNIT – V

Creating Layers- Filters- printing and customization- import, export, printing.

TEXT BOOK

COMDEX DTP Course Kit, Vikas Gupta, Dream Tech Press, 2006 Edition.

LIST OF PRACTICALS:

PAGE MAKER and PHOTOSHOP

PAGEMAKER:

- 1. Design of ID Card (3"×2") / Visiting Card (3.5"×2")**
- 2. Design of an attractive Invitation Card (5.5"×8") / Letter Pad (7.5"×9")**
- 3. Preparation of a small Booklet with six pages (3.5"×4.5")**
- 4. Design of a Handbill (5.5"×8.5") / Advertisement**
- 5. Design of a College Progress Card / a Receipt Bill with counter foil.**

PHOTOSHOP:

- 1. Design of a brochure for an Institution**
- 2. Seasonal Greeting Card**
- 3. Transporting an image from one background to another**
- 4. Design a Web Page Poster (1004×750) / Text Book cover page**
- 5. Crop an image / rotate an image.**

II B.Com – IV Semester Part III Core Subjects (2 courses)

Core 1 - ADVANCED FINANCIAL ACCOUNTING - II

Unit-I

Contract Account- Work uncertified- Work certified -work in progress- profit on completed contracts-profit on incomplete contracts-cost plus contract- Farm Accounting.

Unit-II

Partnership account- partner's capital and current account- profit and loss appropriation account

Unit -III

Admission of the partner-new ratio -Gaining ratio -treatment of goodwill-revaluation account - memorandum revaluation account- Balance sheet after adjustment

Unit IV

Retirement of a partner – sacrificing ratio- settlement of retiring partners loan account-death-joint life policy- settlement of executor's account - Amalgamation - sale of partnership firms.

Unit - V

Dissolution of a firm- realization account - conversion of a firm into a company -insolvency of a partner- two partners, GarnerVSMurray- insolvency of all partners

Gradual realization of assets -- piece meal distribution - proportionate capital method - maximum loss method.

Text and References

Advanced accountancy- volume -1 by. T.S. Reddy & MURTHY , MARGHAM publications, Chennai

Advanced Accountancy- By M.C.Shukla&T.S.Grewal-S.Chand&Co,New Delhi.

Advanced Accountancy- By M.A.Arulanandan&K.S.Raman-Himalaya Publishing House,Mumbai.

Accountancy- By P.C.Tulsian, Tata McGraw-Hill edition

Accountancy – By S.P. Jain&K.L. Narang, kalyanipublishers,new delhi.

Part III Core Subjects (2 courses)

Core 2 Business Statistics

Unit –I

Definition of statistics- Importance – Application- Limitations and Distrusts of statistics- statistical survey – planning and design of survey- collection of Data – primary and secondary data- Questionnaire and schedule- sampling design- Types of samples- classification of data- Tabulation and presentation of data- Diagrams – Two and three dimensional.

Unit- II

Measures of Central tendency- Mean-Median- Mode-Geometric Mean-Harmonic Mean-Measures of dispersion-Range- Quartile Deviation- Mean Deviation- Standard Deviation- variance- co- efficient of variation- skewness-kurtosis -Moments.

Unit –III

Correlation – meaning- types-scatter diagram – karlpearson’sco-efficient of correlation- Rank correlation- concurrent deviationmethod. Regression analysis- uses- methods of studying regression – Regression lines.

Unit IV

Probability-meaning-usefulness – dependent and independent events-mutually exclusive events- simple and compound events-addition theorem – multiplication theorem- problems.

Unit V

Index numbers- meaning-construction of index numbers- its problems – methods of construction – tests of consistencies- fixed base- chain base-consumer price index- problems.

Analysis of time series- trend seasonal and cyclical variations- irregular fluctuations-Methods of measurements- graphic method – moving average method of least square- problems

Text books

Statistical Method-Dr. S.P. Gupta-Sultan chand& Sons, New Delhi.

Books for Reference

Statistics- Theory and practice- R.S.N Pillai&Bhagavathi, S.S.Chand& Co.

Business Statistic - M.Wilson, Himalaya Publishing House, Mumbai.

Skill Based Subject (One Course)

1. INTRODUCTION TO DATABASE MANAGEMENT SYSTEM

UNIT I

Introduction database system applications-database systems versus file systems-view of data-data models-database languages database users and administrators-transaction management-database system structure-application architectures-history of database system.

Entity-relationship model – basic concepts constraints-keys design issues entity relationship diagram

UNIT II

SQL basic structure-set operations-aggregate functions-null values-nested sub queries-aggregate functions-null values-nested sub queries-views complex queries-modification of the database-joined relations-data-definition language-embedded SQL-dynamic SQL-other SQL features.

UNIT III

Integrity and security: Domain Constraint-Referential integrity- Assertions-Triggers-security and Authorization in SQL- Encryption and Authentication.

UNIT IV

Schema Objects Data Integrity-Creating and Maintaining Tables-Indexes-Sequences-Views-Users Privileges and Rolls-Synonyms.

UNIT V

PL / SQL: PL / SQL-Triggers-Stored Produces and Functions-Package-Cursors-Transaction.

TEXT AND REFERENCE BOOKS:

- 1) Database System Concepts-Silberschatz Korth Sudarshan, International (4th edition)Mc Graw Hill Higher Education 2002**
- 2) Jose A. Ramalho-Learn oracle 8i BPB publication 2000.**

Skill Based Subject (One Course)

2. NETWORKS MANAGEMENT

UNIT I PHYSICAL LAYER

Data Communications – Networks – Networks models – OSI model – Layers in OSI model – TCP / IP protocol suite – Addressing – Guided and Unguided Transmission media Switching: Circuit switched networks – Data gram Networks – Virtual circuit networks Cable

UNIT II DATA LINK LAYER

Data link control: Framing – Flow and error control -Protocols for Noiseless and Noisy Channels – HDLC -Multiple access: Random access – Controlled access

**Connecting LANS: Connecting devices – Backbone networks – Virtual LANS
Virtual circuit networks: Architecture and Layers of Frame Relay and ATM.**

UNIT III NETWORK LAYER

Internet Protocol: Internetworking - IPv4, IPv6 – Address mapping – ARP, RARP, BOOTP, DHCP, ICMP, IGMP, Delivery – Forwarding – Routing – Unicast, Multicast routing protocols.

UNIT IV TRANSPORT LAYER

Process-to-Process delivery – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QoS) – Techniques to improve QoS.

UNIT V APPLICATION LAYER

Domain Name System (DNS) – E-mail – FTP – WWW – HTTP – Multimedia Network

Security: Cryptography – Symmetric key and Public Key algorithms – Digital signature -

Management of Public keys – Communication Security – Authentication Protocols.

TEXT BOOKS

- 1. Behrouz A. Foruzan, “Data communication and Networking”, Tata McGraw-Hill, 2006: Unit I-IV**
- 2. Andrew S. Tannenbaum, “Computer Networks”, Pearson Education, FourthEdition, 2003: Unit V**

REFERENCES BOOKS:

- 1. Wayne Tomasi, “Introduction to Data Communication and Networking”, 1/e, Pearson Education.**
- 2. James .F. Kurose & W. Rouse, “Computer Networking: A Topdown Approach Featuring”, 3/e, Pearson Education.**
- 3. C.Sivaram Murthy, B.S.Manoj, “Ad hoc Wireless Networks – Architecture and Protocols”, Second Edition, Pearson Education.**

NON-MAJOR ELECTIVE (1Course)

1. FUNDAMENTALS OF COMPUTER ORGANISATION

UNIT I

Digital and Logic Circuit OR Gate-AND gate –NOT gate –Boolean Algebra-demorgans first theorem and second theorem.

UNIT II Data Representation

Number System-Decimal Representation-Binary conversion-Decimal to Binary conversion-Octal Number –Hexa decimal numbers-ASCII

UNIT III Basic Computer Organizations and design

Introduction Codes-Stored program Organization-Direct Address-Indirect Address-Effective Address – computer Registers-common Bus System –Computer instruction.

UNIT IV Central Processing Unit

Assembly Language –Major Components of CPU –general Register Organization-STACK Organization- instruction formats- Addressing Modes.

UNIT V Memory Unit.

RAM- ROM - Types of ROM - Auxiliary memory - Associative Memory - Cache memory- Virtual memory.

TEXT BOOK:

Computer System Architecture –by Morris Mano ,Third Edition P.H.I private Limited.

REFERENCE BOOKS:

Computer System Architecture P.V.S Rao PHI

NON-MAJOR ELECTIVE (1Course)

2. E-COMMERCE

UNIT-I:

E-Business and E-Commerce: Introduction, Potential Benefits, Limitations, Classifications, Impact of E-Commerce on Business models.

E-Commerce Applications: Entertainment, E-Marketing, E-Advertising,

UNIT-II:

Architecture Framework of E-Commerce: Application Services, Brokerage and Data Management, Interface layers, Secure messaging, Middleware services and network infrastructure.

Web Security Issues, Encryption Techniques: Symmetric and Asymmetric.

UNIT-III:

Consumer Oriented E-Commerce Applications, Mercantile Process Model: Consumers Perspective and Merchant's Perspective.

Electronic Payment Systems: Advantages and risks, Types of Payment System (Credit Cards, E-Cash, Smart-Cards).

UNIT-IV:

Electronic Data Interchange: Non EDI System, Partial EDI System, Fully Integrated EDI System, Prerequisites for EDI.

Issues of EDI: Legal issues, Security issues, Privacy issues.

UNIT-V: E-Marketing Techniques: Search Engines, Directories, Registrations, Solicited targeted E-mails, Interactive sites, Banners, Advertising, Spam Mails, E-mail, Chain letters.

TEXT AND REFERENCE BOOKS:

- 1. E-Commerce: A Managerial Perspective: Micheal change, etc. A1**
- 2. Electronic Commerce – Security: Greenstein & Feinman Risk Management & Control**
- 3. Frontiers of Electronic Commerce: Ravi Kalakota & A.B. Whinston.**

Major Elective (1 Course)

1. OPERATING SYSTEM

UNIT I Introduction - Mainframe systems - Desktop Systems - Multiprocessor Systems - Distributed Systems - Clustered Systems - Real Time Systems - Handheld Systems - Hardware Protection - System Components - Operating System Services

UNIT II

Threads - Overview - Threading issues - CPU Scheduling - Basic Concepts - Scheduling Criteria - Scheduling Algorithms - Multiple-Processor Scheduling - Real Time Scheduling - The Critical-Section Problem - Synchronization Hardware - Semaphores

UNIT III

System Model - Deadlock Characterization - Methods for handling Deadlocks -Deadlock Prevention - Deadlock avoidance - Deadlock detection - Recovery from Deadlocks - Storage Management - Swapping - Contiguous Memory allocation - Paging - Segmentation - Segmentation with Paging.

UNIT IV

Virtual Memory - Demand Paging - Process creation - Page Replacement - Allocation of frames - Thrashing - File Concept - Access Methods - Directory Structure - File System Mounting - File Sharing - Protection

UNIT V

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management. Kernel I/O Subsystems - Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management.

TEXT BOOK:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.

REFERENCES BOOKS:

1. Harvey M. Deitel, “Operating Systems”, Second Edition, Pearson Education Pvt. Ltd, 2002.

2. Andrew S. Tanenbaum, “Modern Operating Systems”, Prentice Hall of India Pvt. Ltd, 2003.

3. William Stallings, “Operating System”, Prentice Hall of India, 4th Edition, 2003.

4. Pramod Chandra P. Bhatt – “An Introduction to Operating Systems, Concepts and Practice”, PHI, 2003.

Major Elective(1Course)(Any One)

2. Indirect tax

Unit –I

Indirect Taxes-meaning- special features- merits-demerits- major reforms in indirect taxation in India.

Unit – II

Central Excise Act 1944- basis condition for excise liability – taxable event- types of excise duty- excisable goods- related buyer- manufacture – processes amounting to manufacture-rules for classification - rules for valuation- transaction value-inclusions and exclusion.

Unit III

Customs Act 1962 – nature of customs duty- taxable event- territorial waters of India-Indian customs waters- types of customs duty- customs value- inclusions and exclusion.

Unit IV

Value Added Tax (VAT)-Meaning- Special features- Need and Mechanism.

Unit –V

Service Tax- Meaning- Need- persons to whom service tax is charged- classification.

Text books:

- 1. Indirect Taxation – Dr.Balachadran, Sultan**
- 2. Central Exercise- V.S.Datey, Taxman publication**
- 3. Indirection Taxes- V.S.Datey, Taxman publication**
- 4. Central Excise for small scale industries- GopinathSarangi**
- 5. Job work for central exercise- B.N.Gururaj**
- 6. A hand book for service tax – C.Parthasarathy&SanjeevAgarwal**
- 7. Customs Law Manual- R.K.Jain**
- 8. Customs Tariff of India – R.K.Jain**

Major Elective

3. Investment Management

Unit I

Investment- nature and scope of investment analysis-elements of investments- return, risk and time elements- objectives of investment- security, return and risk analysis- measurements of return and risk- approaches to investment analysis.

Unit II

Types of investments- financial investment- securities and derivatives, deposits, tax sheltered investments-non financial investments- real estate, gold and other types and their characteristics- sources of financial information.

Unit III

Fundamental analysis- economic analysis- industrial analysis and company analysis- technical analysis-various prices and volume indicators, indices and moving averages, interpretation of various types of trends and indices.

Unit IV

Valuation of securities- fixed income securities, bonds, debentures, preference shares and convertible securities- variable income securities- equity shares.

Unit V

Investment by individuals- investments policies of individuals – Tax savings schemes in India.

Reference Books:

1 Investment Analysis and Management, Clark, James Francis, Tata McGraw Hill Co, New Delhi.

2 Investment Management, J.Fabozzi, Frank, Prentice Hall, New Delhi.

3 Portfolio Management, S. Kevin, Prentice Hall, New Delhi.

PART III-Allied Subject II (One Course)
CORALDRAW WITH APPLICATION

UNIT-I

Starting Coral Draw 12- creating a new file – standard tool bar – tool box – propriety bar – status bar – Coral Draw Views – Zooming – saving a file – closing a file

UNIT II

Basic Drawing – working with lines – straight line – freehand line – Bezier line and curve – Drawing Rectangles and squares – Drawing ellipses and circles – Artistic media tool: preset tool, Brush, sprayer, calligraphic, pressure tool.

UNIT-III

Grouping and Ungrouping objects, fill tool fly out:- fill color dialog, fountain fill Dialog – pattern fill – Texture fill – postscript fill – Interactive fill tool – Interactive tools: Blend tool – Contour tool – Distortion tool – Drop shadow tool envelope tool – Extrude tool – Transparency tool.

UNIT-IV

Working with objects – Using the transformations Docker – Adding effects to objects – Resizing an object – changing the shape of an object – Combining two objects – welding two objects – Rotating an object – working with Text: Text tool – Getting started with the tools cover – Formatting text – Text editor – opening the editor.

UNIT – V

Working with images:- Importing images. Resizing, Rotating, size wing images – Adding special effects to bit map– page layout and Background: changing the page size – changing the page background – inspecting pages – Deleting pages

TEXT BOOK

BOOK : COREL DRAW 12

AUTHOR: Robert Shuffleboth , Publishers : dreamtech press

Edition : 2008

REFERENCES BOOK:

BOOK : COREL DRAW 1X4

AUTHOR: Kogent Solutions Inc.

Publishers : dreamtech press

LIST OF PRACTICAL'S:

- 1. Develop a CorelDraw application to open using some tools in toolbox and saving a application. Develop a CorelDraw application working with Line tools and Artistic media tool give meaningful image**
- 2. Develop a CorelDraw application open a new document and create the brochures.**
- 3. Develop a CorelDraw application open a new document and create the election brochures.**
- 4. Develop a CorelDraw application to open and create the elections voter notes.**
- 5. Develop a CorelDraw application to open and create the front page of a book.**
- 6. Develop a CorelDraw application to open and working with transformations and shapes.**
- 7. Develop a CorelDraw application to open and create Logo with Text Tool**
- 8. Develop a CorelDraw application combing two or more object to get new meaningful object.**
- 9. Develop a CorelDraw application adding some effects to your objects.**
- 10. Develop a CorelDraw application Adding special effects to bit maps**
- 11. Develop a CorelDraw application changing a cover of page Background.**

III B.Com – V Semester Part III Core Subjects (3 Courses)

Core 1 Corporate Accounting I

Unit -1

Issue of shares-issue at par, premium and discount- calls in arrears- calls in advance-Forfeiture and reissue of shares- Pro-rata allotment- redemption of preference shares-issue of Bonus shares.

Unit II

Issue of debentures - redemption of debentures- sinking fund method- Underwriting of shares.

Unit III

Profit prior to incorporation – alteration of share capital and internal reconstruction-Accounting entries.

Unit IV

Valuation of goodwill and shares- various methods of valuation of goodwill and shares.

Unit V

Amalgamation, absorption, and external reconstruction- calculation of purchase consideration – In the books of Vendor and purchaser.

Text and References

Advanced accountancy- volume -1 by. T.S. Reddy & MURTHY , MARGHAM publications, Chennai

Advanced Accountancy- By M.C.Shukla&T.S.Grewal-S.Chand&Co,New Delhi.

Corporate Accounting- By M.A.Arulanandan&K.S.Raman-Himalaya Publishing House,Mumbai.

Accountancy- By P.C.Tulsian, Tata McGraw-Hill edition

Accountancy – By S.P. Jain&K.L. Narang, kalyanipublishers,new delhi.

Core 2 Cost Accounting

Unit I

Cost accounting-Nature- Meaning – Features and importance limitation of financial accounting-advantages and limitation of cost accounting – costing system-cost centre- cost unit- elements of cost- cost classification – cost sheet.

Unit II

Materials –objectives- purchase control- centralized and decentralized purchase – stock levels and EOQ-ABC Analysis-Bin card- stores ledger- Material issue – FIFO,LIFO, Average and weighted average methods

Unit –III

Labour- Direct and indirect labour – methods of wage payments- remuneration and incentives – premium and bonus plans- Idle time- over time- labour turnover.

Unit IV

Overhead- Meaning- classification- allocation and apportionment of overheads- re apportionment of over heads-absorption of over head- methods- machine hour rate.

Unit V

Job costing (simple problems only) – process costing –features- process losses and gains.

Text Books

- 1. Cost Accounting”S.P.Jain and Narang-.Kalyani Publishers.**
- 2. Cost Accounting.S.P.Iyengar.Sultan Chand & Sons.New Delhi**

Reference books

- Das Guptha: Sultan Chand & Sons.New Delhi**
- Cost Accounting..RSN .Pillai: Sultan Chand & Sons.New Delhi**
- Cost Accounting:M.L.Agarwal.Sahitya Bhavan Publications**
- Cost Management,Accounting and Control:Hansen ,Mowen-Thompson
Publication**
- Cost Accounting:S.Polimeni,A.Handy.A.Kasmin,Schaum’s-Outlines,Tata
Macgrw Hill Edition**
- Cost Accounting:An Introduction.B.LM.Lal Nigam.I.C.Jain-Prentice Hall**
- Cost Accounting:Jawaharlal, Tata Macgrw Hill Edition**

Core 3 Business Law

Unit I

**Indian contract Act 1872-Fundamental essential of a valid contract-
classification of contract- offer acceptance- consideration- capacity-free
consent – legality of object – contingent contracts.**

Unit II

**Performance of contract- discharge of contract- breach of contract- remedies-
Quasi contracts.**

Unit III

Special contracts- Indemnity – Guarantee

Unit IV

Bailment – pledge- contract of agency.

Unit V

Sale of Goods Act- Difference between sale and agreement to sell- sale and hire purchase agreement- classification of goods-documents of title to goods- Rights and duties of buyers and sellers – Rights of unpaid seller.

Text books

- 1. Business law- N.D.Kapoor**
- 2. Element of Mercantile Law- N.D.Kapoor,sultanchand& sons**
- 3. Business Law-P.C.Tulsian, Tata McGraw- Hill station.**
- 4. Business Law-R.S.N.Pillai, Bagavathy- S.Chand&Co,New Delhi.**

Reference Books:

- 1. Business and Corporate Law- P.C.Tulsian, Tata McGraw- Hill station.**
- 2. Business Law including Company Law- S.S.Gulshan, G.K.Kapoor- New age International Pvt Ltd, New Delhi.**

PART III-Major Elective (One Course)(anyone)

1. Application of Tally in Accounting

UNIT I

Feature of Tally Accounting concepts-Company creation.

UNIT II

Classification of Accounts-Accounts Master.

UNIT III

Accounts vouchers-Final accounts.

UNIT IV

Stock item-inventory vouchers-invoice

UNIT V

Order processing-Stock summary-MIS Reports-Budget Scenario Management.

TEXT AND REFERENCE BOOKS:

- 1) "Implementing Tally 6.3", A.K. Nadhani, K.K. Nadhani, BPB Publications. Chapters: 1,2,3,5,6,7,9,15,16,17,19,20,17,28.

LIST OF PRACTICALS

ACCOUNTING PACKAGE (TALLY)

1. Create the following company:

Wincom Computers deal in both Software and hardware. It has its corporate office at 55, Indra Nagar, Chennai-12 PAN: B45678K.Lacal S.T.Regn :St/Che/4323. They are not registered under Central Sales Tax.

There are operating within the country.

2. Create Groups and ledgers for sales as under

Sales

Computer sales

Service charges

Installation charges

Annual maintenance charges

Maintenance charges

Software development

3. A. Develop a purchase day book with your own data

B. Create a sales Day Book with imaginary data

C. Create a format of petty cash book with your own figure

4. With the following particulars prepare a Trial Balance

Capital Accounts	50,000
Sales	6, 50,000
Purchases	7, 60,000
Salaries	2, 2000
Carriage inwards	400
Carriage outwards	500
Lighting	300
Rates and Insurance	400
Discount earned	500
Buildings	30,000
Furniture	6000
Sundry Debtors	8000
Sundry creditors	20,000
Cash and Bank	1850

5. Prepare a proper subsidiary book and do the transactions with your own data.
6. Prepare a petty cash book with your own data.
7. Prepare a Balance Sheet with your imaginary data.
8. Prepare a sales invoice of a Super market with your data.

2 Income tax law and practice –I

Unit I

Basic concepts – Person, assessee, previous and assessment year, total income, gross total income – concept of income – Agricultural Income- Income exempted from tax – Residential Status- problems.

Unit II

Income from salary –different forms of salary and allowance – perquisites – problems in computation of salary income.

Unit- III

Income from House property – Annual value – Standard deduction– Unrealized rent – problems in computation of house property income.

Unit –IV

Income from under the Head – Business or profession – deduction allowable – Expressly disallowed expenses – computations – problems in computation of business or professional income.

Unit – V

Income from capital gain - Types - Exemption- Computation- problems in computation of capital gain.

Text Book for reference

- 1. Income tax law and accounts- Dr.H.C.Mehrotra and Dr.P.Mehrotra**
- 2. Income tax law and practice - V.P Gaur, D.B Narang, PoojaGhai and Rajeev Puri.**

3 Logistics Management

Unit I

Logistics- meanings- importance-logistics competency- logistical mission – service- total-cost- logistical renaissance- technological advancement- regulatory change- IT Revolution- TQM Initiatives.

Unit II

Work of logistics- -network design- information- transportation and Inventory- warehousing – material handling- packaging- integrated logistics- Inventory flow – Information flow.

Unit III

Operating objectives- rapid response- minimum variance –minimum inventory –movement consideration- quality- life cycle support- barriers to internal integration in organizational structure – measurement system- inventory ownership – information technology- knowledge transfer capacity.

Unit IV

Information functionality- and inventory functionality- principles of logistics information- information architecture-planning –operations- logistics information flow – application of new information technologies – electronic data interchange standards- inventory functionality- inventory types-

characteristics- cost of carrying inventory- determining order point-lot size- accommodation uncertainty- replenishing ordering and ware housing management.

Unit V

Transportation infrastructure- transport functionality- principles- modal classification- transportation formats- suppliers of transportation services- storage functionality- principles –concept of strategic storage – developing warehouse resource- warehouse strategy

Text books

Logistical management (Integrated supply chain process-by Donald J. Bowersox, David J. Closs- Tata Mcgraw –Hill edition

III B.Com (computer Application)

(IV Semester)-Under CBCS

Common skilled based subjects(1Course)(Any One)

1. Effective Communication

Common skilled based subjects(1Course)(Any One)

2. Personality Development

III B.Com with Computer Application – VI Semester

Part III Core Subjects – 4 Courses

Core 1 Corporate Accounting-II

Unit –I

Liquidators' final statement- contributory.

Unit –II

Holding companies- minority interest- capital profits- cost of control or goodwill- preparation of consolidated balance sheet.

Unit –III

Banking companies-Format of balance sheet and profit and loss account as per sec 29 of Banking Regulation Act.

Unit – IV

Double account system- meaning-difference between double account and single account system- difference between double account- and double entry system-preparation of final accounts- capital base disposal of surplus- calculation of reasonable return- replacement of assets.

Unit V

Accounting ratios- responsibility accounts- human resource accounting.

Text and References

**Advanced accountancy- volume -1 by. T.S. Reddy & MURTHY ,
MARGHAM publications, Chennai**

**Advanced Accountancy- By M.C.Shukla&T.S.Grewal-S.Chand&Co,New
Delhi.**

**Advanced Accountancy- By M.A.Arulanandan&K.S.Raman-Himalaya
Publishing House,Mumbai.**

Accountancy- By P.C.Tulsian, Tata McGraw-Hill edition

Accountancy – By S.P. Jain&K.L. Narang, kalyanipublishers,new delhi.

Core 2 Management Accounting

Unit I

**Management accounting- Definition- Objectives- Nature,scope,function-
management accounting Vs financial accountion-Management Accounting vs
cost accounting- advantages-limitations of management accounting.**

Unit II

**Fund flow and cash flow analysis- meaning –Difference between fund flow
statement and cash flow statement- funds- preparation of fund flow statement
and cash flow statement.**

Unit III

**Marginal costing –meaning- features-assumption- contribution P\V Ratio-
CVPanalysis-Break even analysis-Assumption- Advantages – limitations-
margin of safety.**

Unit IV

Standard costing- meaning of standard cost and standard costing standard costing and budgetary control- Advantages and limitations- analysis of variance- Direct material, direct labour and overhead.

Unit V

Budget and budgetary control- meaning of budget , budgeting and budgetary control- objectives- features- advantages –limitations- flexible budget- cash budget- production budget – purchase budget – sales budget.

Text books:

- 1. Management accounting S.M. Maheswari sultan chand and sons.**
- 2. Management accounting.R.S.N.Pillai&Bhawathi ,S.Chand&co**

Core 3 Industrial Law

Unit I

The factories Act 1948 – Definitions– approval, licensing and Registration of Factories – duties of occupier – Inspection staff- certifying surgeons- provisions for health- safety- welfare- working hours and holidays- employment of young persons and women- Annual leave with wages- penalties and procedure.

Unit II

Workmen's compensation Act 1923 – scope and coverage- definitions- rules- personal injury by accident- occupational disease- arising out of and in the course of employment – theory of notional extension- amount of compensation- distribution of the compensation- notice and claim.

Unit III

Industrial disputes Act 1947 –object- definitions- conciliation machinery – adjudication machinery- powers and duties of authorities- procedures- voluntary reference to arbitration – award- strikes and lock outs-lay off- retrenchment- transfer and closing down of the undertaking – penalties.

Unit IV

The Trade Unions Act 1926- The payment of bonus Act 1965.

Unit V

The Employees state insurance act 1948,- The Payment of Gratuity Act 1972

Text books

Elements of Mercantile Law-N.D.KAPOOR, Sultan chand&sons

Business and corporate law – p.c. tylian , Tata McGraw- Hill edition

Core 4 Auditing

Unit I

Introduction- meaning- objectives – difference between Accountancy and auditing – advantages- limitations- Audit programme- Auditing working papers- preliminaries before audit – test checking and routine checking.

Unit II

Internal check – meaning- objectives- difference between internal control and internal Audit- Advantages and disadvantages of internal check-internal check regarding cash, purchases, purchase returns, sales and sales returns.

Unit III

vouching – meaning- objects- importance of vouchers- precautions to be taken by the auditors while examining vouchers – vouching of various transactions.

Unit IV

Verification of assets and liabilities – meaning- classification of assets- verification of different types of assets- verification of liabilities.

Unit V

Company auditor- appointment- qualification and disqualification removal of auditor- status- rights – duties- and liabilities- auditors report content- kinds of auditor’s report- general considerations for drafting report.

Text book

1 Auditing B.N.Tandon S.Chand & co, new delhi.

2 Auditing Dr.T.R.Sharma, Sahitya publication, Agra

Reference Books:

- 1. Principles and Practice of Auditing- Dinkar Pagare, Sultan Chand & Sons, New Delhi.**
- 2. Text book of Auditing- Saxana, Reddy and Appannaiah, Himalaya Publishing House**

Major Elective (One Course)

1. Multimedia with Application

UNIT I

Multimedia Fundamentals : Basic Concepts – Multimedia applications design consideration – multimedia application Goals and Objectives. Opportunities in multimedia productions – important in multimedia development – application designs and productions.

UNIT – II

Multimedia applications, structure and organization, considering interface design – planning the production of your applications – creating multimedia building blocks.

UNIT – III

Multimedia presentations building blocks: text – graphics.

UNIT – IV

Video capturing – sound capturing – MIDI.

UNIT – V

**Structure and functions of authoring software – authoring software selection of authoring program – fundamentals of macro media directs
5.0**

Text and Reference book:

- 1. Multimedia an introduction, John Villamil – Casa Nova, Louis Molina Prentice Hall/Macmillian Computer publishing reprint.**
- 2. Multimedia: Making it works: sixth edition, Tay Vaughan, TMH.**

LIST OF PRACTICAL'S:

- 1. To design a car with movement and sound effect in flash.**
- 2. To create a simple presentation in flash.**
- 3. To active new window/page using buttons in flash**
- 4. To create a Text motion tweening in flash**
- 5. To create a scrolling gallery in a page in flash**
- 6. To Bouncing a ball with sound effect in flash**
- 7. To create a scenery of rain in the frame in flah**
- 8. To display the news Headlines letter by letter in flash**
- 9. To Start a graphic animation at a specific frame in flash**
- 10.To End Movie clip using script in flash**

2 RETAIL MANAGEMENT

Unit I:

Introductionto retailing-nature and importance of retailing-contemporary retailing in India and marketing challenges facing retailers-Strategic planning in retailing-owning or managing a Business-Wheels of retailing-retailing life cycle.

Unit II:

Types of retailing institutions-retailing institutions by ownership-retailing institutions by store based and non-store based-vertical marketing system-Traditional retailing.

Unit III:

Strategic planning in retailing-understanding retailing environment-identifying and understanding customers, information gathering, designing retail information system- processing of information system and research.

Unit IV:

Location and organizational decisions-Trading area analysis site selection - organizational pattern in retailing- operational management-financial decisions- use of technology.

Unit V:

Merchandise Management-Buying and handling- product assortment decision- Inventory Management- Merchandise pricing- Merchandise Labeling and packing- Retail promotion- Retail promotion strategy- Building retail store image- Role of atmosphere- retail promotion mix strategy- retail store sales promotion schemes.

Text Book:

1.Retailmanagement,Michael Levy and Barton A Weot,McGraw Hill Irwin,

Reference Books:

- 1. Retail management A Strategic Approach, Berman, Barry and Jeol R Evans, Prentice Hall, New Jersey.**
- 2. Retail management, Cox, Roger and Paul Brittain, Prentice Hall, Harlow.**
- 3. Retailing Management-By Michael Levy, Barton A Weitz, Ajay Pandit-McGraw-Hill.Com Company.**

3. Income Tax Law and Practice-II

Unit I

Income under the head-other sources-Computation –Problems.

Unit II

**Set off and carry forward of losses. Deductions from Gross total Income
Problems.**

Unit III

**Procedures for Assessment – Returns – Types of returns -Types of
Assessment- Tax Deducted at source.**

Unit IV

Assessment of Individual- Problems including computation of tax

Unit V

Assessment of firm-Problems including Section 40(b) application.

Text Book for reference

- 1. Income tax law and accounts- Dr.H.C.Mehrotra and Dr.P.Mehrotra**
- 2. Income tax law and practice - V.P Gaur, D.B Narang, PoojaGhai and
Rajeev Puri.**

**NB: For Effective communication and Personality Development University
will send the syllabus.**

APPENDIX – AZ37**MANONMANIAM SUNDARANAR UNIVERSITY****TIRUNELVELI****CHOICE BASED CREDIT SYSTEM****COURSE STRUCTURE FOR B.COM (vocational) COMPUTER****APPLICATION****(Syllabus for those who joined from the academic year 2012 -13 onwards)****III SEMESTER**

Components	Hours	Credits
Part-III- Core Subjects (3 Courses)		
1.Advanced Financial Accounting- I	6	4
2. Business Mathematics	6	4
3. Modern Banking	6	4
Part – IV Skill Based Subjects (Allied Related) (1 course) (Any One)	4	4
1. Introduction to Internet and HTML		
2. Internet and Web Designing		
Part – IV Non-Major Elective (1Course) (Any One)		
1.Introduction to Accountancy	2	2
2.Advertising		
Part – III Allied subject – II (1 Course)		
1. PageMaker and Photoshop (Theory-4hours, Practical – 2 hours)	6	5
Total (6 courses)	30	23

IV SEMESTER

Components	Hours	Credits
Part-III- Core Subjects (2Courses)		
1. Advanced Financial Accounting –II	6	4
2. Business Statistics	6	4
Part – IV Skill Based Subject (1course) (Any One)	4	4
1. Introduction to DBMS		
2. Network Management		
Part – IV Non-major Elective (1Course) (Any One)		
1.Salesmanship	2	2
2. Fundamentals of Business Management		
Part – III Major Elective (1course) (Any one)	6	5
1.Management Information System		
2.Computer system Architecture		
Part – III. Allied Subject –II (1 Course)		
1.Corel Draw With Application	6	5
Theory- 4 hours, Practical- 2 hour		
Part V. Extension Activity (NCC, NSS, YRC, YWF)		1
Total (6 courses)	30	25

Core –I - Advanced Financial Accounting I

UNIT –I

Branch accounting – Meaning-Types of Branches-Debtor's system - Invoice price Method (excluding stock and debtors system)

Unit - II

Departmental accounts- Meaning – Difference between branch and department accounts- Departmental trading and profit and loss accounts- Basis for allocation of expenses- Departmental transfer at invoice price

Unit III

Hire purchase and installment system-Calculation of cash price and interest- Default and Repossession.- difference between Hire purchase and Installment system-interest suspense account

Unit - IV

Royalty account-Meaning-Minimum rent-Short working- Types of recoupment – strike and lockout.

Unit – V

Insolvency accounts- insolvency of an individual– statement of affairs- Deficiency account.

Theory: 20 marks; Problem: 80 marks

Text &Reference

Advanced Accountancy – Dr. M. A. Arulanandam & K.S. Raman – Himalaya Publishing House

R.L. Gupta and RAdhaswamy – sultan Chand & Sons, New Delhi

Advanced Accountancy – M.C. Shukhla & T.S. Grewal – S.Chand & Company, New Delhi

Advanced Accountancy – S.P. Jain & K.L Narang, Kalyani Publishers, New Delhi

Core 2: Business Mathematics

Unit- I

Number systems and equations: counting techniques

Binominal expansion numbers- natural-whole – rational- irrational – real- algebraic expression – factorization-equations-linear – quadratic- solutions-simultaneous linear equations with two or three unknowns- solutions of quadratic equations- Nature of the roots- forming quadratic equation – permutation- combinations – binomial expansion.

Unit –II

Theory of indices – logarithms and progression indices positive indices- zero and negative indices- fractional indices. Logarithms- properties- laws of logarithms- common logarithms. Arithmetic progression nth term – sum of terms

Unit –III

Analytical geometry: distance between two points in a plane slope of a straight line – equation of straight line – point of intersection of two lines – applications (1) demand and supply (2) cost-output (3) break-even analysis.

Unit –IV

Matrices – basic concepts- matrix addition- scalar multiplication – multiplication of matrix- inverses of a matrix- solution of a system of linear equations- matrix method.

Unit – V

Commercial arithmetic percentages – ratio and proportion – simple interest- compound interest- annuities- depreciation – discount-banker's discount true discount – amortization.

Text book:

1. Business mathematics D.S Sancheti&V.K.Kapoor, Sulthan Chand and sons New Delhi
2. A text book of Business Mathematics by G.K. Ranganath- Himalaya Publishing House, Delhi.
3. Business Mathematics- D.C.Sanchetti&B.M.Agarwal.

Theory: 20 marks

Problem: 80 Marks

III Semester Part III Core Subject

Core 3: Modern Banking

UNIT –I

Banking system

Indigenous bankers – commercial banks –co-operative banks - land development Banks-Industrial Development bank-NABARD –EXIM Banks- Foreign Exchange banks- central bank- RBI Vs SBI

UNIT II

Central Banking:

Central bank of India-functions –methods of credit control- traditional and promotional functions – RBI'S monetary policy – opening of new branches – new licensing policy.

UNIT III

Banker and customer

Banker –customer – Relationship between banker and customer- General and special relationship – rights of the banker – cheque: Meaning- essentials of valid cheque- crossing: Definition- types of crossing-endorsement- Types- material alteration- Statutory protection to the paying banker- Statutory protection to the collecting banker.

UNIT IV

Core banking – Home Banking – Retail Banking – Internet banking: Online banking and offline banking – mobile banking-Computerised Banking – Electronic Funds Transfer- ATM and Debit Card – Smart Card – Credit Card – E-Cash- Swift – RTGS– Impact of Technology – Global Developments in Banking Technology.

UNIT V

Modernized banking

Traditional vs. E- Banking transactions- Electronic delivery channels-Advantages of e- Banking – constraints in e-Banking security measures.

Text& Reference Books

1. Banking theory law and practice- K.C Sherlekar
2. Banking theory law and practice-S.N.Lal
3. Banking theory law and practice-M.C Tannen
4. Banking theory law and practice-E.Gordon and K.Natarajan
5. Banking theory law and practice-S.S Gulshan and GulshanK.Kapoor

Skill Based Subject (Allied related) (one course) (any one) – 4 Hours

1. Introduction To Internet and HTML

UNIT I

Introduction to Internet: Computers in business-Network-Internet-Electronic mail-Resource sharing-Gopher-WWW-Usenet-Telnet-Bulletin Services-Wide Area Information Service. Internet browsers: internet Explorer-Netscape Navigator.

UNIT II

Introduction to HTML: Designing a Home page-History of HTML-HTML generations-HTML Documents –Anchor tag-Hyperlinks-Sample HTML Documents.

Head and Body section: Header section-Title-Prologue-Links-Colorful Web page – Comments lines-Designing the body: Heading printing-Aligning the Headings – Horizontal rule-paragraph-Tab Settings-Image and pictures-Embedding PNG format images.

UNIT III

Ordered and unordered lists: List-Unordered lists-headings in a list-Nested lists.-Table handling: Tables-table creations in HTML-Width of the table and cells-Cells spanning multiple rows / columns-coloring cells –column specification.

UNIT IV

DHTML and Style sheets: Defining styles-Elements of styles-Linking a style sheet to an HTML document-Inline styles-Internal & External style sheets-Multiple styles.

UNIT V

Forms: Action attributes-Method attributes-Enctype attributes-Drop down list.

Text and Reference books:

- 1) World wide web design with HTML, c.xavier, TMH, 2001.
- 2) Fundamentals of information technology, Mathew's lenon and Alxis leon, vijay Nicole privaer limited, Chennai.

2. Internet And Web Designing

UNIT – I

Introduction to Internet - Internet Access / Dial-Up Connection – Internet Services’ Features – TCP/IP Vs Shell Accounts – Configuring the Machine for TCP/IP Account – Configuring the Shell Account –Telnet – Changing the Password – World Wide Web (WWW) - Web Page – Hyper Text – HTMLTags – Net Surfing - Internet/Web Browsing - Browser – Internet Addressing – IP Address –Domain Name – Electronic Mail – Uniform Resource Locator (URL) – Internet Protocols – TCP/IP –FTP – HTTP – Telnet – Gopher – WAIS.

UNIT – II

Searching the Web – Web Index – Web Search Engine – Web Meta – Searcher – Search Functions –Search Engines – Meta Search Sites – Directories and Indexes – Specialized Directories – Electronic Mail (E-Mail) – E-Mail Message – Customizing E-Mail Programs – Managing Mails – Zen of ‘Emailing’– Address Book – Signature Feature – File Attachment Facility – Setting priority – Advantages and Disadvantages of E-Mail.

UNIT – III

Introduction to HTML – HTML Code for a Web Page – Web Page Basics – Set up a Web Page –Display a Web Page in a Web Browser – Start a New Paragraph – Start a New Line – Insert Blank Spaces –Heading – Pre-format Text – Comment – Special Characters – Format Text – Emphasize – Superscript and Subscript – Font Style and Size – Color – Margins – Mono Spaced Font – Block Quote – Lists – Ordered List – Unordered List – Nested List.

UNIT – IV

Links - Link to another Web Page – Link within a Web Page – Link to an Image – Link to a File – Email Link – Link to an FTP Site – Change Link Colors – Create Keyboard Shortcuts – Change the Tab Order – Tables – Create a Table – Add a

Border – Caption – Column Groups – Row Groups – Color –Background Images – Aligning Data – Size of a Table – Size of a Cell – Span Cells – Cell Spacing and Cell Padding – Borders – Text Wrapping – Nested Tables – Wrap Text around a Table.

UNIT – V

Sounds and Videos – Link to a Sound – Sound Considerations – Embedded Sound – Extended Video –Video Considerations – Internal Video – Introduction to Forms – Set up a Form – Text Box – Large Text Area – Check Boxes – Radio Buttons – Menu – Upload Files – Submit and Reset Button – Hidden Field –Organize Form Elements – Label Form Elements – Introduction to Frames – Creating Frames – Frame Considerations – Provide Alternative Information – Link to a Frame - Scroll Bars – Resizing Frames– Frame Borders – Frame Margins – Nested Framesets – Inline Frame.

Books for Reference:

1. **Alexis Leon & Mathews Leon**, “Internet for Everyone”, Leon Tech World, Chennai.
2. **Eric Kramer**, “HTML”.
3. **Kamalesh N. Agarwala, Amit Lal & Deeksha Agarwala**, “Business of the Net”.
4. **John Zabour, Jeff Foust & David Kerven**, “HTML 4 HOW- TO”.

Non Major elective (1course) (any one)

1. Introduction to Accountancy

Unit I:

Definition of Accounting- Accounting concepts- journal

Unit II

Preparation of ledger accounts

Unit III

Subsidiary books- purchase book, sales book, purchase return book, sales return book – simple cash book

Unit IV

Preparation of trail balance

Unit V

Preparation of final accounts (with closing stock and outstanding expenses adjustments only)

Text books

1. Advanced accountancy- volume -1 by. T.S. Reddy & MURTHY , MARGHAM publications, Chennai
2. Advanced Accountancy- By M.C.Shukla & T.S.Grewal - S.Chand & Co, New Delhi.
3. Advanced Accountancy- By M.A.Arulanandan & K.S.Raman- Himalaya Publishing House, Mumbai.
4. Accountancy- By P.C.Tulsian, Tata McGraw-Hill edition
5. Accountancy – By S.P. Jain & K.L. Narang, kalyani publishers, New Delhi.

2. Advertising

Unit – I

Advertising – Meaning – Types – Advertising as a career – Importance and benefits.

Unit – II

Classification of customers – retailers – utilisers – media – selection.

Unit – III

Classification of advertising – indoor and out door Advertisement copy – Varieties.

Unit –IV

Advertising Agency – types – role of the agency – Advertising agencies in India.

Unit-V

Public and customer relations – advantages through proper relations – preparations of layout - glamour of advertising – models –fashion shows.

Books for Reference:

- 1) Advertising Management - Mr.Batra pretice Hall
- 2) Advertising Management – Mahendra mohan - Tata Mc Graw – Hill.
- 3) Advertising Management (an Indian perspective) - P.K.Agarwal – Pragati orakashaa, Meerut.

Allied Subject - II (1Course)

Page Maker And Photoshop

UNIT – I

Introduction to DTP – Exploring common features in PageMaker, Working with files and folders, Saving, Moving and Copying, Renaming, Deleting- Editing in PageMaker: PageMaker window, creating- closing publications, editing text- Formatting text.

UNIT - II

Master Pages- placing elements on Master Page-placing Guidelines, placing header and page number, creating Master Page –removing Master Page –editing Master Page – creating columns.

UNIT – III

Working with Graphics and objects: Tool Bar, Placing graphic on the page, importing graphic, resizing a graphic, moving a graphics, cropping a graphic, grouping and ungrouping-Managing and printing- page-orientation-numbering- page size- dimensions-margins- table of content-Managing books.

UNIT – IV

Starting with Photoshop – program window, working with images-rotating, cropping, revealing the hidden image, freehand; Making Selection-selection tool, lasso tool, copying, filling, transforming- painting tools- Drawing tools - retouching tools

UNIT – V

Creating Layers- Filters- printing and customization- import, export, printing.

TEXT BOOK

COMDEX DTP Course Kit, Vikas Gupta, Dream Tech Press, 2006 Edition.

LIST OF PRACTICAL'S:

Page Maker and Photoshop

PAGEMAKER:

1. Design of ID card (3''×2'') / Visiting Card (3.5''×2'')
2. Design of an attractive Invitation Card (5.5''×8'') Letter Pad (7.5''×9'')
3. Preparation of a small Booklet with six pages (3.5''×4.5'')
4. Design of a Handbill (5.5''×8.5'') / Advertisement
5. Design of a College Progress Card / a Receipt Bill with counter foil.

PHOTOSHOP:

1. Design of a brochure for an Institution
2. Seasonal Greeting Card
3. Transporting an image from one background to another
4. Design a Web Page Poster (1004×750) / Text Book cover page
5. Crop an image / rotate an image.

IV Semester, Part III- Core Subject (2 Courses)

1. Advanced Financial Accounting – II

Unit-I

Contract Account- Work uncertified- Work certified -work in progress- profit on completed contracts-profit on incomplete contracts-cost plus contract- Farm Accounting-Accounting treatment-Final accounts.

Unit-II

Partnership account- partner's capital and current account- profit and loss appropriation account

Unit –III

Admission of the partner-new ratio -Gaining ratio -treatment of goodwill- revaluation account – memorandum revaluation account- Balance sheet after adjustment

Unit IV

Retirement of a partner—sacrificing ratio- settlement of retiring partners loan account-death-joint life policy- settlement of executor's account - Amalgamation – sale of partnership firms.

Unit – V

Dissolution of a firm- realization account – conversion of a firm into a company - insolvency of a partner- two partners, GarnerVSMurray- insolvency of all partners Gradual realization of assets -- piece meal distribution- proportionate capital method- maximum loss method.

Theory: 20Marks; Problem: 80Marks

Text and Reference Books

- 1. Advanced Accountancy Volume I.S.P. Janin & K.L.Narang-Kalayni Publishers, New Delhi**
- 2. Advanced Accountancy volume I.R.L. Gupta and M.Radhaswamy-Sultan Chand & Sons, New Delhi**
- 3. Advanced Accountancy volume I.M..Shukla and T.S.GRewal-S.Chand & Co, New Delhi**

IV Semester, Part III- Core Subject (2 Courses)

1. Business Statistics

Unit –I

Definition of statistics- Importance – Application- Limitations and Distrusts of statistics- statistical survey – planning and design of survey- collection of Data – primary and secondary data- Questionnaire and schedule- sampling design- Types of samples- classification of data- Tabulation and presentation of data-Diagrams – Two and three dimensional.

Unit- II

Measures of Central tendency- Mean-Median- Mode-Geometric Mean- Harmonic Mean-Measures of dispersion-Range- Quartile Deviation- Mean Deviation- Standard Deviation- variance- co- efficient of variation- skewness- kurtosis - Moments.

Unit –III

Correlation – meaning- types-scatter diagram – karlpearson'sco-efficient of correlation- Rank correlation- concurrent deviationmethod. Regression analysis- uses- methods of studying regression – Regression lines.

Unit IV

Probability-meaning-usefulness – dependent and independent events- mutually exclusive events- simple and compound events-addition theorem – multiplication theorem- problems.

Unit V

Index numbers- meaning-construction of index numbers- its problems – methods of construction – tests of consistencies- fixed base- chain base-consumer price index- problems.

Analysis of time series- trend seasonal and cyclical variations- irregular fluctuations-Methods of measurements- graphic method – moving average method of least square- problems.

Text books

1. Statistical Method-Dr. S.P. Gupta-Sultan chand& Sons, New Delhi.

Books for Reference

1. Statistics- Theory and practice- R.S.N Pillai&Bhagavathi, S.S.Chand& Co.
2. Business Statistic - M.Wilson, Himalaya Publishing House, Mumbai.

Skill based subjects (1 Course) (Any One)

1. Introduction To Database Management System

UNIT I

Introduction database system applications-database systems versus file systems-view of data-data models-database languages database users and administrators-transaction management-database system structure-application architectures-history of database system.

Entity-relationship model – basic concepts constraints-keys design issues entity relationship diagram

UNIT II

SQL basic structure-set operations-aggregate functions-null values-nested sub queries-aggregate functions-null values-nested sub queries-views complex queries-modification of the database-joined relations-data-definition language-embedded SQL-dynamic SQL-other SQL features.

UNIT III

Integrity and security: Domain Constraint-Referential integrity-Assertions-Triggers-security and Authorization in SQL- Encryption and Authentication.

UNIT IV

Schema Objects Data Integrity-Creating and Maintaining Tables-Indexes-Sequences-Views-Users Privileges and Rolls-Synonyms.

UNIT V

PL / SQL: PL / SQL-Triggers-Stored Produces and Functions-Package-Cursors-Transaction.

TEXT AND REFERENCE BOOKS:

- 1) Database System Concepts-Silberschatz Korth Sudarshan, International (4th edition)Mc Graw Hill Higher Education 2002
- 2) Jose A. Ramalho-Learn oracle 8i BPB publication 2000.

Skilled based Subjects (One Course)

2. Networks Management

UNIT I PHYSICAL LAYER

Data Communications – Networks – Networks models – OSI model – Layers in OSI model – TCP / IP protocol suite – Addressing – Guided and Unguided Transmission media

Switching: Circuit switched networks – Data gram Networks – Virtual circuit networks Cable

UNIT II DATA LINK LAYER

Data link control: Framing – Flow and error control -Protocols for Noiseless and Noisy Channels – HDLC -Multiple access: Random access – Controlled access
Connecting LANS: Connecting devices – Backbone networks – Virtual LANS
Virtual circuit networks: Architecture and Layers of Frame Relay and ATM.

UNIT III NETWORK LAYER

Internet Protocol: Internetworking - IPv4, IPv6 – Address mapping – ARP, RARP, BOOTP, DHCP, ICMP, IGMP, Delivery – Forwarding – Routing – Unicast, Multicast routing protocols.

UNIT IV TRANSPORT LAYER

Process-to-Process delivery – User Datagram Protocol (UDP) –Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QoS) – Techniques to improve QoS.

UNIT V APPLICATION LAYER

Domain Name System (DNS) – E-mail – FTP – WWW – HTTP – Multimedia Network

Security: Cryptography – Symmetric key and Public Key algorithms – Digital signature -Management of Public keys – Communication Security – Authentication Protocols.

TEXT BOOKS

1. Behrouz A. Foruzan, “Data communication and Networking”, Tata McGraw-Hill, 2006: Unit I-IV
2. Andrew S. Tannenbaum, “Computer Networks”, Pearson Education, Fourth Edition, 2003: Unit V

REFERENCES BOOKS:

1. Wayne Tomasi, “Introduction to Data Communication and Networking”, 1/e, Pearson Education.
2. James .F. Kurose & W. Rouse, “Computer Networking: A Top down Approach Featuring”, 3/e, Pearson Education.
3. C.Sivaram Murthy, B.S.Manoj, “Ad hoc Wireless Networks – Architecture and Protocols”, Second Edition, Pearson Education.

Non Major Elective (one course) (any one)

1. SALESMANSHIP

Unit I: Salesmanship – definition – Is an Art or Science or Profession – Objectives of personal selling- Qualities for good salesman- knowledge of the product – Knowledge of the customers

UNIT II: Qualification – Duties- Responsibilities of a sales manager- Types of sales managers

UNIT-III: Selection and Training of salesman- selection procedure- centralized or decentralized Training- types- benefits

UNIT IV: Allocation of work- territory- sales- quota- conferences.

UNIT V: Remuneration – Good Remuneration plan- Paying methods- Bonus payments- motivation for salesman

Text Books;

1).Salesmanship and Publicity- By Dr.R.S.Davar &Dr.S.R.Davar-Vikas publication, New Delhi.

2) Salesmanship and Publicity- J.S.Patel- Sultan Chand & Sons, New Delhi

Non Major Elective (one course) (any one)

2. Fundamentals of Business Management

Unit I: Definition and meaning of management – importance and features of management- Is management a science or an art – functions of management.

Unit II: definition and meaning of planning – Importance- types of plans – steps in planning process

Unit III: Nature and purpose of organizing- principles of organizing- different forms of organization

Unit IV: Nature and importance of motivation – Maslow's theory- Herzberg's theory of motivation

Unit V: Control – definition and meaning- purpose of controlling – elements of control.

Text Books;

1. Principles of Management – P.C. Tripathy and P.N. Reddy
2. Business Management - T. Ramasamy
3. Business Management – D.Dinkarpagare

Major Elective (one course) (any one)

1. Management Information System

Unit I: Foundation concept: Information systems and technologies - Business Applications- Development and Management – fundamentals of strategic advantage – Using information technology for strategic advantage

Unit II: Information technologies: managing data resources-Technical foundations database Management. The networked enterprise- ; telecommunications networked alternatives.

Unit III: Business applications: functional Business systems- Cross functional enterprise systems - Decision support in Business – Artificial Intelligence Technologies in Business

Unit IV: Development process; planning fundamentals- Implementation challenges-Developing “Business systems – implementing business systems.

Unit V: Management challenges: Managing information technology- Managing Global IT- Real world case studies.

Text and Reference Book

1. management Information System 6th Edition , James.o.Brien , TMH Chapters; 1,2,3,4,5,8,9,10 appendix A-1
2. Management Information system=- By laudon & Laudon , 9th Edition ,, PH

Major Elective (one course) (any one)

2. Computer System Architecture

Unit I: Digital Logic Circuit- Digital Computers – logic Gates – Boolean Algebra- Map Simplification- Combinational Circuits

Unit II: Memory Unit- Data Types- Complements- Fixed Point Representation- Floating point Representation- Other Binary Codes

Unit III: Programming the Basic Computer- Machine Language- Assembly language - The Assembler- Program Loops

Unit IV: Input- Output Organisation – Peripheral Devices- Input Output Interface - Direct Memory Access- Input- output Processors

Unit V: Memory organization- Memory Hierarchy- Main Memory- Auxiliary Memory- Cache Memory – Virtual Memory

Text and Reference Book

1. Computer System Architecture-III Edition – M. Morris Mano – Prentice Hall of India

Allied Subjects-II (1Course)

1. Corel draw with Application

UNIT-I

Starting Coral Draw 12- creating a new file – standard tool bar – tool box – propriety bar – status bar – Coral Draw Views – Zooming – saving a file – closing a file

UNIT II

Basic Drawing – working with lines – straight line – freehand line – Bezier line and curve – Drawing Rectangles and squares – Drawing ellipses and circles – Artistic media tool: preset tool, Brush, sprayer, calligraphic, pressure tool.

UNIT-III

Grouping and Ungrouping objects, fill tool fly out:- fill color dialog, fountain fill Dialog – pattern fill – Texture fill – postscript fill – Interactive fill tool – Interactive tools: Blend tool – Contour tool – Distortion tool – Drop shadow tool envelope tool – Extrude tool – Transparency tool.

UNIT-IV

Working with objects – Using the transformations Docker – Adding effects to objects – Resizing an object – changing the shape of an object – Combining two objects – welding two objects – Rotating an object – working with Text: Text tool – Getting started with the tools cover – Formatting text – Text editor – opening the editor.

UNIT – V

Working with images:- Importing images. Resizing, Rotating, size wing images – Adding special effects to bit map– page layout and Background: changing the page size – changing the page background – inspecting pages – Deleting pages

TEXT BOOK:

BOOK : COREL DRAW 12
AUTHOR: Robert Shufflebotham
Publishers: dreamtech press
Edition : 2008

REFERENCES BOOK:

BOOK : COREL DRAW 1X4
AUTHOR: Kogent Solutions Inc.
Publishers: dreamtech press

LIST OF PRACTICAL'S:

1. Develop a CorelDraw application to open using some tools in toolbox and saving a application.
2. Develop a CorelDraw application working with Line tools and Artistic media tool give meaningful image
3. Develop a CorelDraw application open a new document and create the brochures.
4. Develop a CorelDraw application open a new document and create the election brochures.
5. Develop a CorelDraw application to open and create the elections voter notes.
Develop a CorelDraw application to open and create the front page of a book.
6. Develop a CorelDraw application to open and working with transformations and shapes.
7. Develop a CorelDraw application to open and create Logo with Text Tool
8. Develop a CorelDraw application combing two or more object to get new meaningful object.
9. Develop a CorelDraw application adding some effects to your objects.
10. Develop a CorelDraw application Adding special effects to bit maps
11. Develop a CorelDraw application changing a cover of page Background.

APPENDIX – AZ38**MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI****CHOICE BASED CREDIT SYSTEM****COURSE STRUCTURE FOR B.Com Professional Accounting****(Syllabus for those who joined from the academic year 2012 -13 onwards)****II B.Com Professional Accounting – III Semester**

COMPONENTS	HOURS	CREDIT
Part – III Core subjects (3 Courses)		
1. Financial Accounting	6	4
2. Banking Theory and Practice	6	4
3. Auditing & Assurance	6	4
Part – IV Skill Based paper (Subject Based) (1 Course) (any one)	4	4
1. Computer Networks & Internet		
2. Business Communication		
Part – IV Non Major Electives (1 Course) (any one)	2	2
1. Introduction to Accountancy		
2. Advertising		
Part – III Allied Subject- II (I course)	6	5
Business Mathematics		
Total (6 Courses)	30	23

IV Semester

COMPONENTS	Hours	Credit
Part – III Core Subjects (2 Courses)		
1. Corporate Accounting – I	6	4
2. Marketing Management	6	4
Part – IV Skilled Based Subjects (1 Course) (any one)	4	4
1. Stock Market		
2. Import and Export Procedures		
Part – IV Non Major Elective (1 Course) (any one)		
1. Salesmanship	2	2
2. Elements of Financial Accounting		
Part – III Major Elective (1 Course) (any one)		
1. Corporate Finance		
2. Application of Tally in Accounting	6	5
3. Financial Management		
Part – III Allied Subject II (1 Course)	6	5
Business Statistics		
Part –V Extension Activity (NCC, NSS, YRC, YWF)		1
Total (6 Courses)	30	25

II B.Com (PA) – III Semester Part III Core Subjects (3 courses) – 6 Hours

Core 1: Financial Accounting

Unit – I:

Branch Accounts: Dependent Branches: features - Books of accounts – methods of accounting of dependent branches – Debtors System only – Independent Branch.

Unit – II:

Departmental Accounts: Preparation of departmental profit and loss account (Simple Problems only)

Unit - III

Partnership accounts :Legal provisions in the absence of Partnership Deed – Fixed and Fluctuating Capitals – Preparation of final accounts - Past adjustments and Guarantee – Final Accounts of partnership firms- Accounting treatment of Admission, Retirement or death of a partner - Treatment of Goodwill –Preparation of Revised Balance Sheet.

Unit – IV

Dissolution of Partnership firms –Accounting Treatment – Insolvency of partner – Rules established in Garner Vs Murray –Closure of books of accounts – Settlement of amount due to partners -Piecemeal distribution of Assets.

Unit – V

Sale of Partnership to a Limited Company and Amalgamation of firms.

Books for Reference:

1) Advanced Accountancy – Dr. M.A.Arulanandam & K.S. Raman.

Himalaya publishing house, Mumbai.

2) Advanced Accounting – R.L.Gupta, M.Radhasamy, Sultan & Co. New Delhi.

3) Advanced Accountancy – S.P. Jain & K.L.Narang. Kalyani publishers, New Delhi

Core 2: Banking Theory and Practice

Unit I

Banking System in India:-Origin of bank – History – Growth – classifications of banks – commercial banks –**co- operative banks – Rural banks –Industrial Development Banks** – Functions of Commercial Banks – Primary Functions – Secondary Functions - Functions of modern commercial Banks.

Unit II

Central Banking:-Central Bank of India – Functions – methods of credit control – Traditional and Promotional functions - RBI's monetary policy – opening of new branches – new licensing policies.

Unit III

Banking operations: Banker& customer relationship -Customers rights & obligations - Bankers rights & obligations- Deposits and Savings Schemes, Loans & Advances: Principles of sound lending; Secured advances -Modes of creating Charges; Letter of credit - Guarantees

Unit IV

Negotiable Instruments: Essentials features- Cheques- Essentials of a valid cheque- Crossing, Marking and Endorsement of cheque – Holder - Holder in due course – Payment of cheques- statutory protection to paying Banker- Refusal of payment cheques- Collection of cheques- statutory protection to the collecting banker- endorsement of cheque

Unit V

Modern Banking Technology and services: – Core banking – Anywhere Banking – Anytime Banking – Home Banking – Retail Banking – Internet banking – Online banking and offline banking – mobile banking. Computerized Banking – Electronic Funds Transfer – Impact of Technology – Global Developments in Banking Technology. Modern Banking Services – ATM and Debit Card – Smart Card – Credit Card – E-Cash- Swift – RTGS.

Books Recommended

- 1) Banking Theory, Law practice – E.Gordon and Natarajan. K
- 2) Banking theory Law practice – K.C.Sherkekar
- 3) Banking Law and Practice in India M.C.Tanner.

II B.Com (PA) – III Semester Part III Core Subjects (3 courses) – 6 Hours

Core 3: Auditing And Assurance

UNIT – I

Nature and limitations of auditing, Basic principles governing an audit, Ethical principles and concept of Auditor's independence, Relationship of auditing with other disciplines Auditing & Assurance standards. Qualifications and Disqualifications of auditor, appointment of Auditors , removal of auditors, powers and duties auditors, Branch audit, joint audit , special audit, reporting requirements under the Companies Act 1956 .Audit report- Qualifications, disclaimers, Adverse opinion , disclosures, reports Certificates.

UNIT – II

Audit planning, audit programme, control of quality of audit work- delegation and suppression of audit work Documentations – audit working papers Audit files; permanent and current audit files, ownership and custody of working papers

UNIT – III

Audit procedures for obtaining evidence – sources of evidence reliability of audit evidence, methods of obtaining audit evidence – Internal control – elements of internal control, review and documentation, evaluation of internal control system, internal control questionnaire, internal control check list, tests of control, application of concepts of materiality and audit risk, concept of internal audit

UNIT – IV

Approaches to auditing in computerized environment – audit sampling – types of sampling – test checking, techniques of test checks – analytical review procedures

UNIT – V

Vouching of Cash and Credit business transactions

Books for Reference

1. Practical Auditing – B.N, Tandon & S. Sudharsanam – Sultan chand & Sons New Delhi.
2. Fundamentals of Auditing – KamalGupta Ashok Arora – Tata McGraw – Hill Publishing Co., Ltd.,
3. Principles of Auditing – Dinkar Pagare Chand & Sons, New Delhi
4. Auditing – S.C. Agarwal – S.Chand & Co.

SKILL BASED PAPER

1. Computer Net works and Internet

Objectives

To develop of information technology and its use by the business as facilitator and driver

Unit I

Networking concepts – Needs and scope, Benefits: Classification: LAN, MAN, and and VPN: Peer – to peer, client server: Bridge, Gateway, Modem Net work Topologies, Bus, star, Ring, Mesh, Hybrid, and Protocols – OSI, TCP/IP, etc., Networks – components of a LAN, Advantages of LAN.

Unit II

Client server Technology: Limitation of single user systems and need client server Technology: Servers- Database, Application, Print Servers, Transaction Servers, Internet servers, Mail Servers Chat Servers IDS: Introduction to 3- tier and “n” tier architecture (Com, Com+)

Unit III

Data centers: Features and functions, Primary delivery centre and disaster recovery site network security, need Threats and Vulnerabilities, Security levels: techniques.

Unit – IV

Introduction to 3- Tier and “n”Tier architecture (Com,+Com),E-Commerce Nature, Types (B2B, B2C, C2C), Supply Chain Management, CRM

Unit- V

Electronic Data interchange (EDI), Electronic Fund Transfers (EFT), Payment portal, E- Commerce Security, Mobile Commerce: Bluetooth and Wi-Fi, Flowcharts, Decision Tables.

Books for Reference

- 1) Computer networks – Andrew S. Janenbaum –pearson edn.
- 2) Computer networks – uylesblack – Eastern economy.
- 3) Computer networks – R.S. Rajesh – Vikas publishing house
- 4) Computer networks – Larry L. Peterson – Harcourt (India) Pvt., Ltd.,
- 5) Computer networks – Ravikalakota – Addison we sly Long man,
Vikas publishing house
- 4) Computer networks – Larry L. Peterson – Harcourt (India) Pvt., Ltd.,
- 5) Computer networks – Ravikalakota – Addison wesly Long man

2. Business Communication

UNIT 1:

Personnel: Letters calling candidates for written test, drafting interview letters, offer of appointment, provisional appointment orders, final order of appointment, employee disciplinary matters, show cause notices, charge sheets, letters of dismissal and discharge.

Business Letters-essentials and types

UNIT 2:

Letters to customers regarding dues-follow up.

Letters to banks regarding overdrafts, cash credit and account current.

Letter to insurance and payment, renewal of insurance of policy, claims and their settlement.

Letters to public authorities like P.F. commissioner, P & T etc. regarding payment of P.F. contributions, installation of new connections and payment of telephone bills, payment of sales tax, tax deducted at source.

UNIT 3:

Purchase: Request for quotations, tenders, samples and drawings, complaints and follow up. Sales: Drafting of sales letters, circular letters, and status enquiries. Secretarial: Correspondence with shareholders and debenture holders relating to dividends and interest.

UNIT 4:

Miscellaneous: Drafting telegraphic message, correspondence with agents and transport companies, public notices and invitations, representations to trade associations and chambers of Commerce.

UNIT 5:

Modern Communication Devices: Internet, teleconferencing, Mobile Phones, Computers, Laptops, Close circuit TVs. Word processing, Tele printer, Desktop publishing, Electronic Mail(e-mail), Audio Conferencing, Video Conferencing, E-Commerce, Duplication Technology Duplicator, photocopying, Printing, Storage devices.

Books For Reference

R.C. Sharma & Krishna Mohan: Business Communication & Report Writing, TMH, New Delhi.

Raman. S & Swami. R: Business Communication – A Practical Approach, Professional Publications, Madras.

Ramesh & Pattanashetti: Effective Business English & Correspondence.

Majumdar: Commercial Correspondence.

Urmila Rai: Commercial Correspondence.

Pink and Thomsan: English Grammar, Composition and Correspondence.

P N Reddy and Appannah: Essentials of Business Communication.

Non – Major Electives

1: Introduction To Accountancy

Unit – I

DefinItion of Accounting – Accounting concepts – Journal.

Unit- II

Preparation of Ledger Accounts.

Unit –III

Subsidiary Books Purchase book sales books – Purphase Returns book, sales Returens books – simple cash book.

Unit – IV

Preparation of Trial Balance.

Unit – V

Preparation of final Accounts (with closing stock and outstanding expenses Adjustments only)

Books for Reference:

- 1) Advanced Accountancy – M.C. Shuka & T.S. Graewal – S. Chand & Co, New Delhi.
- 2) Accountancy – P.C. Tulsian, Tata ME Graw – Hill Edition.
- 3) Advanced Accountancy – S.P. Jain & Narang K.L.Kalyani Publishers- New Delhi.

2: Advertising

Unit – I

Advertising – Meaning – Types – Advertising as a career – Importance and benefits.

Unit – II

Classification of customers – relations – utilisers – media – selection.

Unit – III

Classification of advertising – indoor and out door Advetising copy – Varieties.

Unit –IV

Advertising Agents – types – role of the agency – Advertising agencies in India.

Unit V

Public and customer relations – advantages through proper relations – preparations of layout glamour of advertising – models –fashion shows.

Books for Reference

- 1) Advertising Management Mr.Batra preticehal
- 2) Advertising Management – Mahendra mohan Tata Mc Graw – Hill.

Allied Subjects (One course)

BUSINESS MATHEMATICS

Unit I

Theory of equations: meaning , types of equations - simple linear and simultaneous equations up to three variables- Quadratic equation – factorization and formula method – Equation of a straight line- intersection of straight lines, graphical solution to linear equations – problems on commercial application

UNIT II

Theory of Indices – positive – Negative – Zero indices – Fractional – Laws of Indices – logarithms – properties – Laws of Logarithms – Common logarithms – Arithmetic progression –and Geometric – Progression.

Unit –III

Matrices and Determinants: meaning and types of matrices- operations of addition, subtractions, multiplication of two matrices- transpose and determinant of a square matrix- minor of an element co-factor of an element of a determinants. Problems application of determinants of business problems, adjacent off a square matrix, singular and nonsingular matrices – inverse of square matrix- solutions of system of linear equations using Cramer’s rule and Matrices .

Unit –IV

Analytical Geometry – co ordinates – Distance between two points – slope and equation of straight line – Area of Triangle – collinearly of three points – concurrencies of lines Application in linear demand and supply curve, cost – output, break even analysis.

Unit – V

Commercial Arithmetic: Simple Interest – compound interest including half yearly and quarterly calculation – Depreciation Concept of Time value of Money- Percentages, bills discounting, annuities and Sinking fund.

Text Books

- 1) Business Mathematics – D. C. Sanchetti and V.K. Kapoor – Sultan chand & Sons New Delhi.
- 2) Text Books of Business Mathematics G.K.Renganth – Himalaya Publishing, House.
- 3) Business Mathematics – D.C. Sanchetti & B.M. Agarwal.

IV SEMESTER

Part III Core Subjects (2 courses)

Core 1: Corporate Accounting I

Unit -1

Issue of shares-issue at par, premium and discount- calls in arrears- calls in advance Forfeiture and reissue of shares (Simple Problems) - Prorata allotment- - issue of Bonus shares and right issue – Underwriting of shares and debentures (simple Problems)-Brief theoretical knowledge of employee stock option plan and buy back of shares and issue of equity shares with differential rights, book Building method Initial public offering –Provisions of company’s Act and SEBI guide lines for issue of bonus shares.

Unit II

Issue of debentures - redemption of debentures out of Profits and sinking fund method (Simple Problems) - Redemption of Preference shares –Computation and treatment of Profits \loss prior to incorporation

Unit III

Profit prior to incorporation – alteration of share capital and internal reconstruction-Accounting entries.

Unit IV

Valuation of goodwill and shares- various methods of valuation of goodwill and shares.

Unit V

Amalgamation, absorption, and external reconstruction- calculation of purchase consideration – In the books of Vendor and purchaser

Books for reference

- 1) Advanced accountancy – S.P. Jain S.K.L. Narang – kalyani publishers
New Delhi
- 2) Advanced accountancy – M.C. Shukla and T.S. Grewal – (S.Chand & co)
-New Delhi
- 3) Advanced accountancy Dr. M.A. Arulanandam & K.S. Raman –
Himalaya publishing house Mumbai

Core 2: Marketing Management

UNIT I

Introduction to Marketing: Definition, nature scope and importance of marketing, approaches to the study of marketing and economic development, traditional and modern concept of marketing – Functions of marketing

UNIT II

Marketing Environment (Micro & Macro): Analyzing needs & trends in the Macro environment- demographic, Economic natural, technologies, Political- Legal, socio cultural environment- Marketing Mix – the elements of marketing mix. Market Segmentation: Bases for Market segmentation, Requisites of sound marketing segmentation – Market targeting strategies- Positioning – Undifferentiated marketing - Concentrated marketing

UNIT III

Classification of products Product mix decision – Product line, product addition & deletion, Product life cycle, Product planning, New product development process, strategies- Branding – Packaging. Pricing: Pricing objectives, price determination, factors influencing pricing policy, method of pricing policies and strategies

UNIT IV

Channels of distribution and Logistics and promotion: Definition - Need – channel design decision –channel management decision – factors affecting channels, types of marketing channels. Promotion; Nature and importance of promotion, promotional methods –advertising decisions, sales promotion, and public relation direct selling. Advertising copy, evaluation of advertising , personal selling and sales promotion

UNIT V

Recent trends in Marketing; E-Commerce- Business Models of E-Commerce- Benefits and limitation of E-Commerce- Tele-marketing, Relationship Marketing- Retailing concept- Modern Retail Formats- Reasons for Development of the Retail Sector- Retail marketing strategies

Books for Reference:

- 1) Philip Kotler- Marketing Management
- 2) J.C.Gandhi- Marketing Management
- 3) William M. Pride and O.C.Ferrell- Marketing
- 4) Stanton W.J.Etzel Michael & Walker-Fundamentals of Management
- 5) Armstrong & Kotler, Marketing: An Introduction , Pearson.

Skill Based Subject (1Course) (any one)

1.Stock market

Unit-I

Introduction to financial market

Financial market: capital market and money market- functions of financial markets- product dealt in capital markets- importance features of equity shares, mutual fund and derivative products. Product dealt in money market important features of bonds, debentures, commercial paper, treasury bills- important.

Unit II

Market participants and Regulatory frame work

Registered intermediaries : brokers, sub- brokers portfolio managers, bankers to issue, merchant bankers, registrars, underwriters, portfolio managers, credit rating agencies- services rendered by the intermediaries to investors- FIIs and DIIs-ADRs and GDRs.

Unit III

Primary and secondary market

Primary market- its role and functions- principal steps involved in floating a public issue- pricing of issues fixed pricing method and book building method- mediums of secondary market brief description of national stock exchange and Bombay stock exchange and over the counter exchange of India –listing of securities in stock exchanges – listing requirements- benefits of listing- delisting of securities.

Unit – IV

Screen- based trading system and stock market index

Understanding Index numbers methodology for index construction – understanding S&PCN X NIFTY and SENSEX – concept of Risk and return of stock – systematic and Non- systematic risk- diversification of Risk through portfolio of stock.

Unit –V

Depositories

Dematerialization of securities – Benefits of Dematerializing – Depositories- need for establishment of depositories - role played by depositories- depository participants – opening account- with depositories – objectives of depository Act 1996.

References:-

1. Bhole, L.M. Financial Institutions and markets (3rd Ed) Tata MCGRAW – Hill publishing Company
2. National stock Exchange of india, Mumbai
Website – www.nseindia.com

2. Import And Export Procedures

Unit-I

Internal and International trade, Difference between Internal and International Trade-Features of International Trade-Advantages and disadvantages of giving protection.

Unit-II

Balance of Trade-Meaning- Balance of Trade VS Balance of Payments- components of Balance of payment-Equilibrium and disequilibrium in the Balance of payments-causes for disequilibrium-measures for correcting disequilibrium exchange control-meaning-objectives- methods of exchange control.

Unit-III

Export procedure-Preliminary steps in exporting-export documents-documents related to goods-certificates related to shipment-documents related to payment.

Unit-IV

Import procedure-Import of capital goods-EPCG scheme - import under duty exemption scheme - procedure for customs clearance - levy of customs duty kinds of customs duty-imports by export oriented units-Export processing Zone.

Unit-V

Export promotion-objectives-organizational setup-Incentives-marketing assistance-import facilities for exports-major problems of India's export sector.

Books for Reference

International trade and Export management – Francis cherunilam – Himalaya Publishing house, New Delhi.

Export Management – D.K. Jhurara – Galgotia Publishing Company – New Delhi

IV SEMESTER

NON MAJOR ELECTIVES

1. Salesmanship

Unit I Salesmanship – definition – Is an Art or Science or Profession – Objectives of personal selling- Qualities for good salesman- knowledge of the product – Knowledge of the customers

UNIT II Qualification – Duties- Responsibilities of a sales manager- Types of sales managers

UNIT-III Selection and Training of salesman- selection procedure- centralized or decentralized Training- types- benefits

UNIT IV Allocation of work- territory- sales- quota- conferences.

UNIT V Remuneration – Good Remuneration plan- Paying methods- Bonus payments- motivation for salesman

Text Books;

1).Salesmanship and Public- by Dr.R.S.Davar &Dr.S.R.FDavar-Vikas publication, New Delhi.

2) Salesmanship and Publicity- J.S.Patel- Sultan Chand & Sons, New Delhi

2. Elements of Financial Accounting

Unit I Average Due Date

Unit II Rectification of Errors

Unit III Bills of Exchange-Retirement, Renewal, and Dishonour, excluding accommodation Bills

Unit IV Consignment Accounts-Simple problems only at cost price

Unit V Joint venture-separate set of books only

Text and Reference Books:

Advanced Accountancy: Volume I-S’P’Jain & K.L.Narang-Kalyani Publishers, New Delhi

Advanced Accountancy Volume I: R.L.Gupta and Radhasamy-Sultan Chand & Sons, New Delhi.

Major Electives

1. Corporate Finance

Unit - I

Corporate Finance- Definition- Scope and importance- Finance function- classification and description of finance function.

Unit –II

Capital structure –Financial and operating leverage –Long Term and Short Term capital.

Unit- III

Capitalisation – Over capitalisation –Under capitalisation –Capital gearing - lease financing –types, importance and limitations.

Unit –IV

Working capital management –Determinants of working capital - importance – financing of working capital management – receivable – inventories and cash management.

Unit – V

Financial markets – money market – capital market – recent trends in capital market – mutual funds – factoring – forfeiting – depositories.

Reference Books

1. Kulkarni – Corporate Finance
2. Vasant Deshi – Indian financial system
3. I.M.Pandey – Financial Management
4. S.N.Maheswari – Corporate Finance

2: Application Of Tally In Accounting

Unit – I Introduction to tally

Tally features – technological advantages of tally accounting software – tally screen components – gateway of tally.

Unit –II Company and accounting information menu

Company information menu – creating a company – accounting information menu – concepts of groups in tally – managing and operating groups – managing and operating ledgers

Unit – III Managing and operating accounting vouchers

Meaning of voucher – predefined vouchers in tally, accounting vouchers, entering transactions in a voucher working with vouchers – (Addition, Insertion, and Alteration. Deletion and Duplication of voucher)

Unit – IV Managing and operating inventory information and Inventory Vouchers

F11 features F12 configuration – stock items, units of measure, stock groups, stock categories, go down, price list, inventory vouchers

Unit – V Tally reports

Reports which can be accessed from gateway of Tally under “Reports”, Reports which can be accessed through the menu “Display” under report-Export and import of data-Printing reports-

(Practical 30 Hours per Semester)

Books for Reference

1. Tally User Manual, Tally Solutions (P) Limited
2. Tally-Nadani
3. Tally-Namrata Agrawal

Application of TALLY in Accounting

1. Create an ‘Accounts With Inventory Company ‘by Activating the necessary F11 Company features – Change the address of the company – Convert it into ‘Accounts only Company ‘– Delete the created Company
2. Opening of necessary ledger accounts from the given trial balance and Prepare final accounts
3. Accounting voucher posting from the given transactions and display of day Book and alteration in Day Book

4. Create necessary Stock Group, Stock Item and Units of Measure, Go down

And making inventory voucher posting and display the stock summary and

Individual Stock Item Report

5. Preparation Price list for the given stock and entering it in the voucher.

Theory -4 hours

Practical- 2 hours

3. Financial Management

Unit-I

Scope and objectives of Financial Management: Meaning Importance and objectives-conflicts in profit versus value maximization principle-Role of chief Financial officer. Time value of money-compounding and Discounting techniques-concepts of Annuity and perpetuity. Financial Analysis and planning-Ratio analysis for performance evaluation and financial health-Application of Ratio Analysis indecision making.

Unit-II

Analysis of Fund Flow and Cash flow statement.

Unit-III

Financing decisions-Cost of capital-Weighted average cost of capital and Marginal cost of Capital-Capital structure decisions-capital structure patterns, Designing optimum capital structure. Constraints-various capital structure theories-Business Risk and Financial Risk-operating and Financial leverage-Trading on Equity.

Unit IV

Types of financing-Different sources of finance project financing-Intermediate and Long term financing-Negotiating term loans with banks and financial Institutions and appraisal thereof-Interduction to lease financing-Venture Capital finance.

Investment Decisions-Purpose, objective, Process understanding different types projects-techniques of decision making: Non discounted and discounted cash flow approaches-payback period method Accounting rate of return, Net Present Value, Internal rate of return, modified rate of return, discounted payback period and profitability index-ranking of competing projects, ranking of projects with unequal lives.

Unit-V

Management of Working Capital: Working Capital Policies. Fund Flow Analysis-inventory management-Receivables Management-Payables Management-Management of cash and marketable securities-Financing of Working capital.

Books for Reference:

Financial Management-I.M.P. panday-Vikas Publishing House pvt Ltd.

Financial Management-Sashi K.GUPTA R.K.sharma-Kaiyani Publishers.

Financial Management Theory and practice-Prasanna Chandra-Tata MCGraw Hill Publishing company Ltd. 4. Financial Management Principles and Practice-Sudhindra Bhat-Excel Books.

ALLIED PAPER

Business Statistics

UNIT – I

Definition of statistics – importance - application – limitation and distrusts of statistics – statistical survey – planning and design of survey – collection of data – primary and secondary data – questionnaire and schedule -sampling design- types of samples – classification of data – Tabulation and presentation of data - diagrams – Two and three dimensional

UNIT – II

Measures of central tendency – mean – median – mode – geometric mean – harmonic mean measures of dispersion – range – quartile deviation - mean deviation – Standard deviation – variance - co-efficient of variation – skew ness – kurtosis – moments

UNIT – III

Correlation – meaning – types – scatter diagram – Karl Pearson's co-efficient of correlation Rank- correlation – concurrent deviation method - regression analysis – uses – methods of regression – Regression lines

UNIT – IV

Probability – meaning –usefulness- dependent and independent events – Mutually exclusive events – simple and compound events – Addition theorem – Multiplication theorem – problems

UNIT – V

Index numbers – meaning – construction of index numbers – its problems – method of construction – tests of consistence's – fixed base - chain base –

consumer price index – problems analysis of time series – trend – seasonal and

cyclical variation – irregular fluctuations – method of measurements – graphic+-39 method – moving average – method of least square- problems

Text books:

Statistical methods – Dr.S.P. Gupta Sultan chand & sons, New Delhi

Books for Reference

1. Statistics – theory and practice – R.S. N Pillai & Bhagavathi. S-S.Chand & Co, New Delhi
2. Business statistics – M.Wilson, Himalaya Publishing House, Mumbai

APPENDIX – AZ39**MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI -12****CHOICE BASED CREDIT SYSTEM****COURSE STRUCTURE FOR B.COM Corporate Secretaryship****(Syllabus for those who joined from the academic year 2012 -13 onwards)****II .B.COM (CS) III SEMESTER**

Components	Hours	Credits
Part-III- Core Subjects (3Courses)		
1.Advanced Financial Accounting	6	4
2.Business Mathematics	6	4
3.Modern Banking	6	4
Part - IV Skill Based Subjects (Allied Related) (1 course)(Any One)		
1.Business Communication	4	4
2. Office Management		
Part – IV Non-major Elective (1Course) (Any One)		
1.Introduction to Accountancy	2	2
2.Consumer Awareness		
Part – III Allied subject-II (1Course)		
Secretarial Practice	6	5
Total (6 Courses)	30	23

II.B.COM (CS) - IV SEMESTER

Components	Hours	Credits
Part-III- Core Subjects (2Courses)		
1.Advanced Financial Accounting –II	6	4
2. Business Statistics	6	4
Part – IV Skill Based Subject (Allied Related) (1 course) (Any One)		
1. Entrepreneurship Development	4	4
2. Career Planning		
Part IV Non-major Elective (1Course) (Any One)		
1. Financial Accounting	2	2
2. Human Rights		
Part III Major Elective (1course) (Any one)		
1. Indirect Tax		
2. Stock Market		
3. Investment Management		
4. Office Automation, Theory-4 Hours, Practical -2 hours	6	5
Part III Allied Subject-II (1 Course) Corporate Finance	6	5
Part V Extension Activity (NCC,NSS, YRC, YWF)		1
Total (6 courses)	30	25

CORE –I - ADVANCED FINANCIAL ACCOUNTING I

UNIT –I

Branch accounting – Meaning-Types of Branches-Debtor’s system - Invoice price Method(excluding stock and debtors system)

Unit - II

Departmental accounts- Meaning – Difference between branch and department accounts- Departmental trading and profit and loss accounts- Basis for allocation of expenses- Departmental transfer at invoice price

Unit III

Hire purchase and installment system-Calculation of cash price and interest- Default and Repossession.- difference between Hire purchase and Installment system-interest suspense account

Unit - IV

Royalty account-Meaning-Minimum rent-Short working- Types of recoupment – strike and lockout.

Unit – V

Insolvency accounts- insolvency of an individual– statement of affairs- Deficiency account.

Theory: 20 marks; Problem: 80 marks

Text &Reference

Advanced Accountancy – Dr. M. A. Arulanandam & K.S. Raman – Himalaya Publishing House

R.L. Gupta and RAdhaswamy – sultan Chand & Sons, New Delhi

Advanced Accountancy – M.C. Shukhla & T.S. Grewal – S.Chand & Company, New Delhi

Advanced Accountancy – S.P. Jain & K.L Narang, Kalyani Publishers, New Delhi

Core 2: BUSINESS MATHEMATICS

Unit- I

Number systems and equations: counting techniques

Binominal expansion numbers- natural-whole – rational- irrational – real- algebraic expression – factorization-equations-linear – quadratic- solutions-simultaneous linear equations with two or three unknowns- solutions of quadratic equations- Nature of the roots- forming quadratic equation – permutation- combinations – binomial expansion.

Unit –II

Theory of indices – logarithms and progression indices positive indices- zero and negative indices- fractional indices. Logarithms- properties- laws of logarithms- common logarithms. Arithmetic progression n^{th} term – sum of terms

Unit –III

Analytical geometry: distance between two points in a plane slope of a straight line – equation of straight line – point of intersection of two lines – applications (1) demand and supply (2) cost-output (3) break-even analysis.

Unit –IV

Matrices – basic concepts- matrix addition- scalar multiplication – multiplication of matrix- inverses of a matrix- solution of a system of linear equations- matrix method

Unit – V

Commercial arithmetic percentages – ratio and proportion – simple interest- compound interest- annuities- depreciation – discount-banker's discount true discount – amortization.

Text book

1. Business mathematics D.S Sancheti&V.K.Kapoor, sulthan Chand and sons
New Delhi
2. A text book of Business Mathematics by G.K. Ranganath- Himalaya
Publishing House, Delhi.
3. Business Mathematics- D.C.Sanchetti&B.M.Agarwal.

Theory: 20 marks**Problem: 80marks****CORE 3: MODERN BANKING****UNIT –I****Banking system**

Indigenous bankers – commercial banks –co-operative banks- land development
Banks-Industrial Development bank-NABARD –E XIM Banks- Foreign Exchange
banks- central bank- RBI Vs SBI

UNIT II**Central Banking:**

Central bank of India-functions –methods of credit control- traditional and
promotional functions – RBI’S monitory policy – opening of new branches – new
licensing policy.

UNIT III

Banker and customer

Banker –customer – Relationship between banker and customer- General and special relationship – rights of the banker – cheque: Meaning- essentials of valid cheque- crossing: Definition- types of crossing-endorsement- Types- material alteration- Statutory protection to the paying banker- Statutory protection to the collecting banker.

UNIT IV

Core banking – Home Banking – Retail Banking – Internet banking: Online banking and offline banking – mobile banking-Computerised Banking – Electronic Funds Transfer- ATM and Debit Card – Smart Card – Credit Card – E-Cash- Swift – RTGS– Impact of Technology – Global Developments in Banking Technology.

UNIT V

Modernized banking

Traditional vs. E- Banking transactions- Electronic delivery channels-Advantages of e- Banking – constraints in e-Banking security measures.

Books recommended

1. Banking theory law and practice- K.C Sherlekar
2. Banking theory law and practice-S.N.Lal
3. Banking theory law and practice-M.C Tannen
4. Banking theory law and practice-E.Gordon and K.Natarajan
5. Banking theory law and practice-S.S Gulshan and GulshanK.Kapoor

Skill based subjects(Allied Related)

(1 course)(any one)

1. BUSINESS COMMUNICATION

Unit- I

Introduction – Importance – definition-process of communication- functions-media for communication- communication network- verbal Vs non- verbal communication –barriers to communication- various electronic communication systems.

Unit-II

Business correspondence principles of letter writing – structure and layout-planning and preparation.

Unit –III

Quotations- orders- tenders- sales letters- claim and adjustment letters- credit and collection letters.

Unit – IV

Job related communication- letter of application- drafting the application- elements of structure of application- Resume preparation.

Unit-V

Employment interview- Types of interviews-preparation for the candidates to attend the interview- before the interview- during the interview- interview process- dos and don't and tips for the successful interview.

Text books

1. Effective business communication ashakaul prentice hall
2. Business correspondence and report writing – third edition – R.C Sharma & Krishnamohan Tata-McGraw Hill

Reference books

1. Advanced business communication penrosemesberry, myers Thomson south western
2. Business communication marry ellan ,guffey- Thomson-south western.
3. Business correspondence and office management- P.N. GhoseRajendra Paul,J.S.Korlahalli- sultan chand and sons
4. Office management- R.S.N. Pillai, Bagavathi - S.Chand&co

2. Office Management

Unit-I

Office – meaning- features- importance- office management- nature, function and scope- office manager- functions and qualification- flow of work- organization charts and manual.

Unit II

Office accommodation- principles- location of an office- layout- office furniture- office environment- office lighting, ventilation, interior decoration- noise and dust- physical hazards, sanitary requirements- cleanliness.

Unit III

Mail and correspondence- handling mails-organization of mailing department- handling inwards and outwards mail- internal and external communication- oral and written communication.

Unit IV

Filing- Essentials of a good filing system- centralized Vs decentralized filing system- classification of filing system- Methods of filing system.

Unit V

Indexing – meaning- objects- Indexing types- forms control and design- continuous stationary.

Text Book:

1. B.N Tandon, Manual of office management and Correspondence, S. Chand &CoLtd.,New Delhi.
2. S.P. Arora- Office Organization and Methods- Vikas Publishing House Private Ltd.,
3. R.K.Chopra, office organization and Management, Himalaya Publishing House.
4. BalrajDuggal, Office Management and Commercial Correspondence, KitabMahal.
5. R.S.N.Pillai and Bagavathy, Commercial Correspondence and office management, S.Chand Company Ltd., New Delhi

Non Major elective (1course)(any one)

1. Introduction to Accountancy

Unit I

Definition of accounting- accounting concepts- journal

Unit II

Preparation of ledger accounts

Unit III

Subsidiary books- purchase book, sales book, purchase return book, sales return book – simple cash book

Unit IV

Preparation of trail balance

Unit V

Preparation of final accounts (with closing stock and outstanding expenses adjustments only)

Text books

1. Advanced accountancy- volume -1 by. T.S. Reddy & MURTHY , MARGHAM publications, Chennai
2. Advanced Accountancy- By M.C.Shukla&T.S.Grewal-S.Chand&Co,New Delhi.
3. Advanced Accountancy- By M.A.Arulanandan&K.S.Raman-Himalaya Publishing House,Mumbai.
4. Accountancy- By P.C.Tulsian, Tata McGraw-Hill edition
5. Accountancy – By S.P. Jain&K.L. Narang, kalyanipublishers,new delhi.

2. Consumer Awareness

Unit –I

Meaning of consumer- Meaning of consumerism- Objectives-Consumer needs- Types of consumers.

Unit II

Consumer Rights- Meaning and sources- Six rights of the consumers under Consumer Protection Act- Right to safety, information , choice, be heard, Redressal and Consumer education- Consumer responsibility.

Unit III

Exploitation of Consumer- pricing, adulteration, information and labeling, duplication, artificial demand, spurious goods, late deliveries, advertising , poor after sales service, warranty and services, fitness, not honoring terms and conditions for sale and services, financial frauds, credit card frauds and product risk.

Unit IV

Consumer protection- Meaning- Need for consumer protection-why consumer protection?-how can we provide consumer protection?

Unit V

Consumer protection Act-1986- Objectives-Machinery for the speedy settlement of consumer disputes and redressal of grievances – consumer disputes redressal forum at the district level- consumer redressal commission at the state level- National consumer redressal commission at the National level.

Text books

1. Shri. Ram Khanna ,saivtaHanunspalSheetalKapoor, H.K,Awasthi- Consumer affairs , University press.
2. MohineSetr and P. Seetharaman Consumerism A Growing concept phoenix publishers, New Delhi
3. R.S.N.Pillai and Bagavathi Modern Marketing Principles and Practices S.Chand and Company.
4. M.J.Anotony, Consumer Rights Clarion book.

S.A.Sherlekar, Marketing management, Himalaya publication house.

Allied Subject II (I Course)

SECRETARIAL PRACTICE

UNIT I Secretary- Definition- Kinds of secretaries- Functions of Secretaries- Qualifications- Appointment – Dismissal - Legal Positions, powers, rights, duties and responsibilities.

UNIT II Secretarial practice relating to formation of a company- secretarial practice relating to issue, allotment , calls, forfeiture and surrender of shares Secretarial practice relating to transfer and transmission of shares – Secretarial practice relating to dividend – register – register of members

UNIT- III Meetings – kinds of Meetings, statutory Meetings- Annual General Meetings- Extra ordinary general Meetings- Class of meetings. (Specimen form of notice, agenda, minutes)

UNIT IV Requisition of valid meeting – notice – quorum – chairman- and his duties- proxy- voting and polls- resolution and its kinds – minutes- duties of the secretary in connection with meeting.

UNIT V Winding up-Procedure for winding up – duties of secretaries in respect winding up procedures after winding up orders- defunct company

Reference and Text books:

1. Company Law and Secretarial Practice – P.K.Ghosh and Dr.V.Balachandar
2. Manual of Secretarial practice – B.N.Tandon.

II B.Com(CS)– IV Semester Part III Core Subject – 6 Hours

1. Advanced Financial Accounting – II

Unit-I

Contract Account- Work uncertified- Work certified -work in progress- profit on completed contracts-profit on incomplete contracts-cost plus contract- Farm Accounting-Accounting treatment-Final accounts.

Unit-II

Partnership account- partner's capital and current account- profit and loss appropriation account

Unit –III

Admission of the partner-new ratio -Gaining ratio -treatment of goodwill-revaluation account – memorandum revaluation account- Balance sheet after adjustment

Unit IV

Retirement of a partner—sacrificing ratio- settlement of retiring partners loan account-death-joint life policy- settlement of executor's account - Amalgamation – sale of partnership firms.

Unit – V

Dissolution of a firm- realization account – conversion of a firm into a company - insolvency of a partner- two partners, GarnerVSMurray- insolvency of all partners Gradual realization of assets -- piece meal distribution- proportionate capital method- maximum loss method.

Theory: 20 marks

Problem: 80marks

Text and Reference Books

- 1. Advanced Accountancy Volume I.S.P. Janin & K.L.Narang-Kalayni Publishers, New Delhi**
- 2. Advanced Accountancy volume I.R.L. Gupta and M.Radhaswamy-Sultan Chand & Sons, New Delhi**
- 3. Advanced Accountancy volume I.M...Shukla and T.S.GRewal-S.Chand & Co, New Delhi**

2. Business Statistics

Unit –I

Definition of statistics- Importance – Application- Limitations and Distrusts of statistics- statistical survey – planning and design of survey- collection of Data – primary and secondary data- Questionnaire and schedule- sampling design- Types of samples- classification of data- Tabulation and presentation of data-Diagrams – Two and three dimensional.

Unit- II

Measures of Central tendency- Mean-Median- Mode-Geometric Mean- Harmonic Mean-Measures of dispersion-Range- Quartile Deviation- Mean Deviation- Standard Deviation- variance- co- efficient of variation- skewness- kurtosis - Moments.

Unit –III

Correlation – meaning- types-scatter diagram – karlpearson'sco-efficient of correlation- Rank correlation- concurrent deviationmethod. Regression analysis- uses- methods of studying regression – Regression lines.

Unit IV

Probability-meaning-usefulness – dependent and independent events- mutually exclusive events- simple and compound events-addition theorem – multiplication theorem- problems.

Unit V

Index numbers- meaning-construction of index numbers- its problems – methods of construction – tests of consistencies- fixed base- chain base-consumer price index- problems.

Analysis of time series- trend seasonal and cyclical variations- irregular fluctuations-Methods of measurements- graphic method – moving average method of least square- problems.

Text books

1. Statistical Method-Dr. S.P. Gupta-Sultan chand& Sons, New Delhi.

Books for Reference

1. Statistics- Theory and practice- R.S.N Pillai&Bhagavathi, S.S.Chand& Co.
2. Business Statistic - M.Wilson, Himalaya Publishing House, Mumbai.

Skill based subject (Allied related)

1course(Any one)

1. Entrepreneurship Development

Unit I Entrepreneurship – meaning- definition- importance – Entrepreneur – types of entrepreneurs – functions of entrepreneurs – qualities of entrepreneurs – entrepreneur as a career – role of entrepreneur in economic development.

Unit II Factors affecting entrepreneurial growth – economic – social – cultural – psychological and sociological factor – women entrepreneurship – functions and problems of women entrepreneurs

Unit III MSME – definition – overview of MSME in India – Government policies & support measures – schemes and incentives – problems and prospects of MSME in India – entrepreneurship development programmes.

Unit IV Industrial finance to entrepreneurs – TIIC, SIDBI and commercial banks. Institutional support to entrepreneurs – EDII - NAYE - KVIC - DIC and industrial estates

Unit V Project report – meaning and importance – contents of project report – project appraisal – market feasibility – technical feasibility – financial feasibility and economic feasibility

Text and Reference Books

1. Entrepreneurship – Robert D Hisrich, Michael P Peters & Dean A Shephard, TataMcgraw Hill Co.
2. Entrepreneurship Development – N.P. Srinivasan, Sultan Chand & Sons.
3. Entrepreneurship Development – P. Saravanavel, Esspeekay Publishing House.
4. Entrepreneurial Development – S.S. Khanka, S. Chand & Sons.

2. Career Planning

Unit –I

Job application- content of an application- Model Application Letter-Resume Building- content of resume – Models of a Resume- Speaking skills- Essentials of a good speech- Content of a speech- qualities of a good speaker- Self introduction- Giving speech on a general topic.

Unit – II

Group Discussion-Meaning- features of Group Discussion- Requirement for effective group discussion- Role to play in Group Discussion- How to Participate in Group Discussion? – Role of Group leader- Model of Group Discussion (class room practice)-Report Writing - Meaning of Report-importance – types- features of a good report- steps in preparing a general report.

Unit III

Interview – Meaning- Types-Significance- Interview Techniques-preparing before interview- How to participate in an interview?-Model Interview (class room practice) – General Awareness preparation.

Unit IV

Test of Numerical Ability (simple question)-Simplification – percentage – profit and loss-Ratio and proportion – Time and work- Time and distance – Calendar-Clock problems

Unit V

Test of Reasoning Ability (verbal only)- Analogy, odd man out, coding and decoding- Direction sense Test- position and order- Alphabet test-Blood Relation-common sense test- puzzle Test.

Reference books:

1. Dr. Shubha Miller and S.C. Aggarwal Guide to careers for commerce Graduates.
2. Prakash .J. Shaw- How to Develop your Personality,
3. BevosshBhikshu- Steps to success
4. Kochar S.K. Educational and vocational Guidance in Colleges and Universities.
5. Mohan.K.and Mani Ram Agrawal-General Knowledge Digest.
6. Arokian J.B. Career Counselling.
7. AgrawalR.S.Modern Approach to Verbal Reasoning
8. Agrawal R.S. Quantitative Aptitude.

Non Major Elective (1Course)(Any One)**1. Financial Accounting****Unit I**

Average due date

Unit II

Rectification of Errors

Unit III

Bills of exchange- Retirement, Renewal and dishonor, excluding accommodation Bills

Unit IV

Consignment Accounts- Simple problems only at cost price

Unit V

Joint Venture- Separate set of Books Only

Text books

1. Advanced Accountancy Volume I S.P.Jain&k.INarang-Kalyani publishers, New Delhi
2. Advanced Accountancy Vol I; R.L.Gupta and M.Radhaswamy- Sultan Chand & Sons, New Delhi.

Non Major Elective (1 Course)(Any One)

2. Human Rights

Unit –I

Meaning- Definition of Human Rights- Characteristics of human rights- kinds of Human Rights-Civil and political- social economic and cultural rights

Unit – II

Violation of human rights- Patterns of violations and abuses- Action against violation of human rights as per Indian law

Unit III

Rights of the Disabled Persons- Declaration on the rights of disabled persons 1975- International year of disabled persons 1981

Unit –IV

Bonded labour- Concepts and definitions- Constitutional and legal provisions- Salient features of bonded labour system(abolition) Act 1976- Role of the national human rights commission

Unit -V

Minorities Rights commission & its functions- Definitions- National commission for minorities- Functions of the commissions

Text books

1. Human Rights and Law – Paras Diwan, Peerushi Dewan
2. Human Rights – Dr. Giriraj Shah, IPS & K.N. Gupta, IPS
3. Teaching of Human Rights – Jagannath Mohany

Major Elective (1 Course)(Any One)

1. Indirect Tax

Unit –I

Indirect Taxes-meaning- special features- merits-demerits- major reforms in indirect taxation in India.

Unit – II

Central Excise Act 1944- basis condition for excise liability – taxable event- types of excise duty- excisable goods- related buyer- manufacture – processes amounting to manufacture-rules for classification - rules for valuation- transaction value- inclusions and exclusion.

Unit III

Customs Act 1962 – nature of customs duty- taxable event- territorial waters of India-Indian customs waters- types of customs duty- customs value- inclusions and exclusion.

Unit IV

Value Added Tax (VAT)-Meaning- Special features- Need and Mechanism.

Unit –V

Service Tax- Meaning- Need- persons to whom service tax is charged- classification.

Text books

1. Indirect Taxation – Dr.Balachadran, Sultan
2. Central Exercise- V.S.Datey, Taxman publication
3. Indirection Taxes- V.S.Datey, Taxman publication
4. Central Excise for small scale industries- GopinathSarangi
5. Job work for central exercise- B.N.Gururaj
6. A hand book for service tax – C.Parthasarathy&SanjeevAgarwal
7. Customs Law Manual- R.K.Jain
8. Customs Tariff of India – R.K.Jain

2. Stock Market

Unit-I

Introduction to financial market

Financial market: capital market and money market- functions of financial markets- product dealt in capital markets- importance features of equity shares, mutual fund and derivative products. Product dealt in money market important features of bonds, debentures, commercial paper, treasury bills- important.

Unit II

Market participants and Regulatory frame work

Registered intermediaries : brokers, sub- brokers portfolio managers, bankers to issue, merchant bankers, registrars, underwriters, portfolio managers, credit rating agencies- services rendered by the intermediaries to investors- FIIs and DIIs-ADRs and GDRs.

Unit III

Primary and secondary market

Primary market- its role and functions- principal steps involved in floating a public issue- pricing of issues fixed pricing method and book building method- mediums of secondary market brief description of national stock exchange and Bombay stock exchange and over the counter exchange of India –listing of securities in stock exchanges – listing requirements- benefits of listing- delisting of securities.

Unit – IV

Screen- based trading system and stock market index

Understanding Index numbers methodology for index construction – understanding S&PCN X NIFTY and SENSEX – concept of Risk and return of stock – systematic and Non- systematic risk- diversification of Risk through portfolio of stock.

Unit –V

Depositories

Dematerialization of securities – Benefits of Dematerializing – Depositories- need for establishment of depositories - role played by depositories- depository participants – opening account- with depositories – objectives of depository Act 1996.

References:

- 1.Bhole,L.M.Financial Institutions and markets(3rd Ed),
Tata MCGraw-Hill Publishing company.
- 2.National stock exchange of india,Mumbai,
website-www.nseindia.com.

3. Investment management

Unit I

Investment- nature and scope of investment analysis-elements of investments-return, risk and time elements- objectives of investment- security, return and risk analysis- measurements of return and risk- approaches to investment analysis.

Unit II

Types of investments- financial investment- securities and derivatives, deposits, tax sheltered investments-non financial investments- real estate, gold and other types and their characteristics- sources of financial information.

Unit III

Fundamental analysis- economic analysis- industrial analysis and company analysis- technical analysis-various prices and volume indicators, indices and moving averages, interpretation of various types of trends and indices.

Unit IV

Valuation of securities- fixed income securities, bonds, debentures, preference shares and convertible securities- variable income securities- equity shares.

Unit V

Investment by individuals- investments policies of individuals – Tax savings schemes in India.

Reference Books

1. Investment Analysis and Management, Clark, James Francis, Tata McGraw Hill Co, New Delhi.
2. Investment Management, J. Fabozzi, Frank, Prentice Hall, New Delhi.
3. Portfolio Management, S. Kevin, Prentice Hall, New Delhi.

4. Office Automation

Unit – I Introduction to Office

Introduction to Office 2000- Opening and closing office programs –Microsoft Office –Shortcut Keys-tool bars-Customizing Office Application-Files and Folders-Configuring printers-Installation programs.

UNIT- II Ms-Word

Creating a document – Copying and moving text – Formatting the document (Font, Paragraph, Bullets & Numbering, Page Setup). Inserting Page breaks – Page Numbers – Margin – Application of Header & Footer. Creating Tables – Entering Text – Formatting table – Using Formulas. Mail Merge – Letter – label – Envelope

UNIT-III Ms-Excel

Introduction to electronic Spread sheet-excel 2000. Basics creating and saving a workbook-entering data into work sheet within (manual-Automatic)-basic formatting-Basic Excel function-Chart [various types].

UNIT-IV Ms- PowerPoint

-Create a new presentation using Blank presentation – Formatting text and applying

Designs and background of slide. Create a new presentation using Templates – Apply Custom animation, Slide Transition, Sound effect – View show. Create a new presentation using Auto Content Wizard .

UNIT-V Ms- Access and Tables

Creating a New Blank databases - Creating table – Field size – Caption – Data types - Indexed Unicode – Compression – Decimal places. Modifying Tables - Modifying Field Property.

Text Book

Office 2000: the complete reference, stepen L.Nelson

Reference

1. Vikas Gupta, Comdex Computer Course Kit (XP Edition), Dreamtech publish, Delhi
2. Fndamentals of computing C Programming and MS office,Alexis Leon ,Mathews Leon,Chitra,jeyarai,Vijay Nicole Private Limited

Office Automation-Practical

MS Word

a. Text Manipulation

Changing the font size and type

Aligning and justification of text

Underlining the text

Indenting the text

- i. Prepare a Bio-data
- ii. Prepare a Letter

- b. Usage of numbering, bullets, footer and headers
 - i. Prepare a document and Auto format
 - ii. Prepare a document with built , footers and headers
- c. Tables and Manipulations
 - i. Create a Calender and auto format
 - ii. Create a Marksheet-using table
 - iii. Picture insertion and alignment
- d. Mail Merge Application

M.S Excel

- i. creating and saving Excel sheet
- ii. Usage of formulas and built-in functions
- ii. Describe the type of function
- iii. Data Sorting
- iv. Mark sheet preparation
- v. Inserting Chart

M.S Power point

- i. Creating and saving Presentation
- ii. Prepare a presentation of your own

M.S Access

- i. Creating database of your own
- ii. Modify table content in database

Allied II. Corporate Finance

Unit - I

Corporate Finance- Definition- Scope and importance- Finance function-

classification and description of finance function.

Unit –II

Capital structure –Financial and operating leverage –Long Term and Short Term

capital.

Unit- III

Capitalisation – Over capitalisation –Under capitalisation –Capital gearing - lease

financing –types, importance and limitations.

Unit –IV

Working capital management –Determinants of working capital - importance –

financing of working capital management – receivable – inventories and cash

management.

Unit – V

Financial markets – money market – capital market – recent trends in capital

market – mutual funds – factoring – forfeiting – depositories.

REFERENCE BOOKS:

1. Kulkarni – Corporate Finance
2. Vasant Deshi – Indian financial system
3. I.M.Pandey – Financial Management
4. S.N.Maheswari – Corporate Finance

APPENDIX - AZ40

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

B.A. DEGREE SOCIOLOGY

SCHEME OF EXAMINATION

ALL UNITS MUST BE EQUAL REPRESENTATION WHILE SETTING QUESTIONS

PART – A – (1 x 10 marks)

Ten Objective Type questions

Each question carries one Mark

PART – B – (5 x 5 = 25 marks)

Question with inbuilt choice (either or pattern) should be set for answering in two hundred words. Choose either (a) or (b) from each question.

PART – C – (5 X 8 = 40 marks)

Descriptive type questions with inbuilt choice (either or Pattern) should be set for answering in 500 words.

COURSE STRUCTURE FOR B.A. DEGREE SOCIOLOGY UNDER CBCS

(For who those joined the course from the Academic Year 2012-2013

SEMESTER	COMOPONENTS	HOURS	CREDITS
I SEMESTER	Part – I Tamil/ Other Languages (1 Course)	6	3
	Part – II English (1 Course)		3
	Part – III Core Subjects Principles of Sociology - I	5	5
	Social Research & Statistics - I (2 Courses)	5	5
	Allied Subject - 1 Social Demography (1 Course)	6	5
	Common Subject Environmental Studies (1 Course)	2	2
	Total (6 Courses)	30	23
II SEMESTER	COMOPONENTS	HOURS	CREDITS
	Part – I Tamil/ Other Languages (1 Course)	6	3
	Part – II English (1 Course)	6	3
	Part – III Core Subjects Principles of Sociology - II	5	5
	Social Research & Statistics (2 Courses)	5	5
	Allied Subject - 2 Social Anthropology (1 Course)	6	5
Common Subject Value based Education (1 Course)	2	2	
	Total (6 Courses)	30	23
III SEMESTER	COMOPONENTS	HOURS	CREDITS
	Part – I Tamil/ Other Languages (1 Course)	6	3
	Part – II English (1 Course)	6	3
	Part – III Core Subject Foundations of Sociological Thought -I (1 Course)	6	5
	Skilled Based subject Human Resource Management. (1 Course)	4	4
	Non-major Electives Introduction to Sociology (1 Course) <i>(Suggested Sociology Non major paper for other U.G degree Major students)</i>	2	2
	Allied Subject – 3 Social Psychology (1 Course)	6	5
	Total (6 Courses)	30	22
IV SEMESTER	COMOPONENTS	HOURS	CREDITS
	Part – I Tamil/ Other Languages (1 Course)	6	3
	Part – II English (1 Course)	6	3
	Part – III Core Subject Foundations of Sociological Thought - II (1 Course)	6	5
	Skilled Based subjects Entrepreneurship (1 Course)	4	4
	Non-major Electives Indian Social System (1 Course) <i>(Suggested Sociology Non major paper for other U.G degree Major students)</i>	2	2
	Allied Subject – 4 Sociology of Education (1 Course)	6	5
	Total (6 Courses)	30	22
V SEMESTER	COMOPONENTS	HOURS	CREDITS
	Part – III Core Subjects Indian Social Institutions	7	5
	Rural Sociology (2 Courses)	7	5
	Electives Sociology of Health (2 Courses)	6	5
	Social Gerontology (2 Courses)	6	5
Common Skilled Based subjects N.G.O. Management			
Personality Development (1 Course)	4	4	
	Total (5 Courses)	30	24
VI SEMESTER	COMOPONENTS	HOURS	CREDITS
	Part – III Core Subjects Industrial Sociology	6	5
	Contemporary Social Problem	6	5
	Urban Sociology	6	5
	Social Reform Movements in India (4 Courses)	6	5
Elective Sociology of Social Work (1 Course)	6	5	
Sociology of welfare			
	Total (5 Courses)	30	25
	Part – V - Extension Activities		1
	Total Number of courses, Hours, Credits :	34 (Courses)	140 (CREDITS)
		180 (Hours)	

Notes:

1. Distribution of marks between Theory and internal Assessment 75:25
2. There is a pass minimum of 40 % for external and overall components.
3. Internal Marks shall be allotted in the following manner: Test Mark: 20 + Assignment:5 Marks, Total: 25 Marks
4. Electives for 5th semester, Select any two courses out of three electives
5. Electives for 6th semester, select any one course out of two electives

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B.A.Sociology

B.A. SOCIOLOGY THIRD SEMESTER

CORE SUBJECT - 5 - FOUNDATIONS OF SOCIOLOGICAL THOUGHT -I (Hours-6 & Credits-5)

UNIT - I - AUGUST COMTE:

Auguste Comte: Science of Sociology. Positivism. Law of Human Progress. Hierarchy of sciences. Social Statics and Social Dynamics.

UNIT - II - HERBERT SPENCER:

Herbert Spencer: Science of sociology. Theory of Social Evolution. Classification of Societies. Organic Analogy.

UNIT - III - KARL MARX:

Karl Marx: Dialectical materialism. Materialistic Interpretation of History. Class and Class Struggle. Theory of Alienation. Theory of social change.

UNIT - IV - MAX WEBER:

Ideal Type. Social Action. Authority. Bureaucracy. Religion and Economy.

UNIT - V - EMILE DURKHEIM:

Emile Durkheim: Social facts. Methodology of social sciences. Collective representations. Sociological Interpretation of Religion. Theory of Social Solidarity. Division of labour. Theory of Suicide.

BOOKS FOR REFERENCE

1. Coser, Lewis A. **Masters of Sociological Thought: Ideas in Historical and Social context** 2nd Ed. New York: Harcourt Brace Jovanovich, 1997.
2. Wallace, Ruth A and Wolf Alison. **Contemporary Sociological Theory**, Englewood Cliffs New jersey, Prentice Hall, 1980.
3. Timasheff, Nicholoas S. **Sociological Theory: Its Nature and Growth**, 3rd Ed. New York: Random house, 1967.
4. Nisbet, Robert A. **The Sociological Tradition**, London: Heinemann, 1967.
5. Abraham Francis, M. and Morgan, John Henry, **Sociological Thought**. Madras: Macmillan India, 1985.
6. Merton, Robert k., **Sociological Theory and Social Structure**. Indian Ed. New Delhi: Ameernd Publishing co., 1968.

B.A. SOCIOLOGY THIRD SEMESTER

Skill based subject – 1 - **HUMAN RESOURCE MANAGEMENT** (Hours-4 & Credits-4)

UNIT-I-HUMAN RESOURCE MANAGEMENT:

Meaning. Nature. Objectives. Scope. Functions. Qualities of Human Relation Manager Emerging challenges and future of Human Resource Management in India. Evolution of H.R.M in India.

UNIT-II-HUMAN RESOURCE DEVELOPMENT:

Meaning. Objectives. Nature. Benefits. Role of HRD Management. Emerging issues of Human Resource Management. Essentials of Human Resource Development.

UNIT-III- CAREER PLANING AND DEVELOPMENT

Definition. Steps. Concept of Career Development. Elements of Career Planning. Career Councelling: Objectives, Advantages and limitations. Mobility: Internal mobility,Need, purpose,Types: Promotion and Transfer. External Mobility; Effects of External Mobility. Controlling External Mobility.

UNIT-IV- MAN POWER PLANNING

Meaning. Objectives. Nature. Need and importance. Forms of Man Power Planning. Process of Human Resource Planning. Limitation of human resource planning .Manpower Planning – Principles of Man Power Planning-Job description – Job analysis –Job specification – Recruitment and Selection – Training and Development.

UNIT -V- DISASTER MANAGEMENT

Concept. Causes and types of Disasters and their impact on society. India's disaster management policy: From post disaster relief and rehabilitation to pre-disaster management and need of disaster management. The role of the state and civil society in disaster management and administration.

BOOKS FOR REFERENCE

1. Gupta.C.B.,Human Resource Management,New Delhi: Sulthan chand & co,2006
2. Srinivasan. N.P. Entrepreneurship Development in India, New Delhi: Sultan Chand and Sons,2007.
3. P. Saravanavel Kay, Ess, Pee,Kay., Entrepreneurial Development Principles, Policies and Programmes.
4. Vasant Desai, Dynamics of Entrepreneurial Development in India Himalaya Publishing House
5. Tripathy – Personal Management and Industrial Relations
6. Bhagolival – Personal Managemnet and Industrial Relations.
7. Memoria – Personal Management and industrial Relations.
8. Organision Development – Wendell, L. French and Cecil H. Bell, Jr.
9. Gole S :L Disaster 'Adminstration and management Text and case studies'. Deep –Deep publication, Delhi 2007.
10. Gandhi P.T. 'Disaster mitigation and management post Tsunami perspectives'. Deep-Deeppublication,Delhi. 2007.

B.A. SOCIOLOGY THIRD SEMESTER

* **Non - Major Elective - 1 -*** **INTRODUCTION TO SOCIOLOGY** (Hours 2 & Credits 2)

* (Sociology Non-Major elective paper for other Major students)

UNIT-I-SOCIOLOGY

Definition. Nature. Scope. Factors contributing to the emergence of sociology. Importance of Sociology.

UNIT-II- SOCIETY

Meaning. Characteristics. Relationship between Individual and Society. Theories of the Origin of Society; Social Contract Theory. Organismic Theory.

UNIT-III- SOCIAL INSTITUTION

- (i) Meaning. Difference between Institution and Society. Difference between Institution and Community.
- (ii) Family: Definition. Nature. Forms.Function
- (iii) Marriage: Definition. Aims. Types.
- (iv) Kinship. Meaning. Types. Kinship usages

UNIT-IV – SOCIALIZATION

Meaning. Process. Factors of the process of Socialization. Types. Stages. Agencies of Socialization.

UNIT-V- SOCIAL CONTROL

Meaning. Nature. Purpose. Types: Formal & Informal. Agencies: Folkways. Mores. Religion. Morality. Law. Education.

BOOKS FOR REFERENCE

1. Bierstedt, Robert., The Social Order, New Delhi, Tata McGraw Hill Book Company, 1980
2. Koaning,Samuel., Sociology: An introduction to the Science of Society, New York: Banaras and Noble Books, 1963.
3. Horton, Paul B., and Hunt, Chester. L., Sociology, Tokyo: McGraw Hill International Book Company, 1984.
4. Bottomore, T.B., Sociology: A Guide to Literature and Problems. New Delhi: George Allen and Unwin, 1972.
5. Ogburn William. R and Nimkoff, Mayer F.A. Handbook of sociology, Eurasia Publishing House, New Delhi, 1964.
6. Rao, Shankar C.N. An introduction to sociology, New Delhi: S.Chand & Co., 1960

B.A. SOCIOLOGY THIRD SEMESTER

Allied Subject- 3 – SOCIAL PSYCHOLOGY - (Hours -6 & Credit -5)

UNIT – I – SOCIAL PSYCHOLOGY:

Social Psychology: Definition. Aim. Nature. Scope. Relation of social Psychology with other sciences.

UNIT – II – SOCIALIZATION:

Meaning. Need. Stages of Socialization. Agents of Socialization. Important of Socialization. Socialization and Development of Self. Theories of Socialization: C.H.Cooley, G.H.Mead, and Sigmund Freud's theories of Socialization.

UNIT – III – PERSONALITY:

Meaning. Traits. Types. Determinants of personality: Heredity, Environment. And Culture. Growth and development of personality. Important of personality development.

UNIT – IV – ATTITUDES:

Meaning. Characteristics of Attitude. Formation of Attitudes. Types of Attitudes. Changing Attitudes. Measurements of attitude: Scales of Thurston, Likert, Bogardus and Guttman. Sociometry.

UNIT – V – LEADERSHIP:

Meaning. Features of Leadership. Types of Leaders. Styles of Leadership. Qualities of Leadership.

BOOKS FOR REFERENCE

1. Batia, Hans Raj. **Elements of Social Psychology**. Bombay: Somaiya Publications, 1974.
2. Kuppusamy B. **An Introduction to Social Psychology**. 2nd rev. ed. Bombay: Media promoters and Publishers, 1980.
3. Young, Kimball, **Handbook of Social Psychology**. London: Routledge & Kegan Paul, 1963.
4. Newcomb, et.al., **Social Psychology**. New york: Rinehart & Winston, 1965.
5. Krech, David & Krutchfield, Richard S., **Theory and Problems of Social Psychology**. New York: McGra-Hill Book Company, 1948.
6. Newcomb, et. al., **Social Psychology**. Bombay: Asia Publishing House, 1965.
7. Akolkar.V.V. **Social psychology**. Bombay: Asia Publishing House, 1965.

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B.A.Sociology

B.A. SOCIOLOGY FOURTH SEMESTER

**Core Subject- 6-FOUNDATIONS OF SOCIOLOGICAL THOUGHT - II
(Hours-6 & Credit 5)**

UNIT – I – VILFREDO PARETO:

Vilfredo Parito: Logico-Experimental Method. Logical and Non-Logical Actions. Residues and Derivations. Circulation of Elites.

UNIT – II – GEROGE SIMMEL:

George Simmel: Formal Sociology. Sociology of Conflict. Theory of Domination. Concept of Social Mobility.

UNIT – III – PITRIM SORIKIN:

Pitrim Sorikin: Integralist Sociology. Theory of Socio-Cultural Dynamics. Theory of Social Revolution. Concept of Social Mobility.

UNIT – IV – TALCOTT PARSONS:

Talcott Parsons: Theory of Action. Pattern Variables. Theory of Social System.

UNIT – V – ROBERT K.MERTON:

Robert K. Merton: Role Set Theory. Reference group theory. Social structure and anomie. Functional analysis: Manifest and Latent Functions. Dysfunctions.

BOOKS FOR REFERENCE

1. Coser, Lewis A. **Masters of Sociological Thought: Ideas in Historical and Social context** 2nd Ed. New York: Harcourt Brace Jovanovich, 1997.
2. Wallace, Ruth A and Wolf Alison. **Contemporary Sociological Theory**, Englewood Cliffs New jersey, Prentice Hall, 1980.
3. Timasheff, Nicholoas S.**Sociological Theory: Its Nature and Growth**, 3rd Ed. New York: Random house,1967.
4. Nisbet, Robert A. **The Sociological Tradition**, London: Heinemann, 1967.
5. Abraham Francis, M. and Morgan, John Henry, **Sociological Thought**. Madras: Macmillan India, 1985.
6. Merton, Robert k., **Sociological Theory and Social Structure**.Indian Ed. New Delhi: Ameirnd Publishing co., 1968.

B.A. SOCIOLOGY FOURTH SEMESTER

Skill based subject - 2 - ENTREPRENEURSHIP (Hours-4 & Credits-4)

UNIT - I - ENTREPRENEURSHIP

Entrepreneurship: Meaning - Importance. Types - Functions - Role of Entrepreneurs in Economic Development - Qualities of an Entrepreneur - Entrepreneurships a career.

UNIT - II - HOW SO START BUSINESS

How so start Business - Product Selection - Form of Ownership - Plant Location - Land, Building. Water and Power - Raw Materials - Machinery - Man power - Other Infrastructure Facilities - Licensing Registration and Local Bye-Laws.

UNIT -III- INTUITIONAL ARRANGEMENT FOR ENTREPRENEURSHIP DEVELOPMENT

Intuitional Arrangement for Entrepreneurship Development - D.I.C. - I.T.C.O.T., S.I.D.C.O. - N.S.I.C. - S.I.S.I. - Institutional Finance to Entrepreneurs. T.I.I.C., S.I.D.B.I.

UNIT - IV - PROJECT REPORT

Project Report: Meaning and Importance - Project Identification - Contents of a project Report - Formulation of a project report - Project appraisal; - Market feasibility - Technical Feasibility - Financial Feasibility and Economic Feasibility.

UNIT - V - Entrepreneurship Development

Entrepreneurship Development in India - Women Entrepreneurship in India - Sickness in small scale industries and their remedial measures.

BOOKS FOR REFERENCE

1. Dr. C.B. Gupta, Dr, N.P. Srinivasan. **Entrepreneurship Development in India**, Sultan Chand and Sons.
2. P. Saravanavel Kay, Ess,Pee,Kay., **Entrepreneurial Development Principles, Policies and Programmes.**
3. Vasant Desai, **Dynamics of Entrepreneurial Development in India** Himalaya Publishing House

B.A. SOCIOLOGY FOURTH SEMESTER

- ***Non - Major Elective subject- 2 – *INDIAN SOCIAL SYSTEM(Hours-2 & Credit 2)***
**** (Sociology Non-Major elective paper for other Major students)***

UNIT – I –SOCIAL CLASSES IN INDIAN SOCIETY:

Varna: Concept. Theories of the Origin of Varna system. Traditional Features of Indian Society. Purusharthas. Ashramas.

UNIT – II- CASTE SYSTEM

Meaning. Characteristics of Caste System. Conditions Favaourable to Caste. Conditions Unfavourable to Caste. Caste among musilims. Caste among Christians. Contemporary trends in Caste System.

UNIT – III – INSTITUTION OF MARRIAGE IN INDIA

Hindu Marriage: Meaning. Goals of Hindu Marrage. Forms.

Musilims Marriage: Meaning. Kinds.Musilim Law of Divorse.

Cristian Marriage: Meaning. Objectives. Rules for the Christian Marriage.

UNIT – IV-INDIAN FAMILY SYSTEM

Meaning. Features. Functions.. Joint Family System: Meaning. Factors for the Disintegration of Joint Family System.

UNIT – V-SOCIAL MOBILITY

Definition. Types. Sanskritization: Meaning. Analysis of the process of Sanskritization. Westernisation: Definition. Features of the Process of Westernization. Effects. Modernisation: Definition. Causes. Problems.

BOOKS FOR REFERENCE

1. Ghurye, G.S. Castes and Race in India.3rd ed. Bombay, Popular Prakashan,1969.
2. Kapadia, K.M. Marriage and Family in India. Bombay: Oxford University press, 1966.
3. Srinivas, M.N. Caste in Modern India and Other Essays. Bombay: Asia Publishing House, 1962.
4. Singh, Yogendra, Social Change in India: Crisis and Resilience. New Delhi: Har-Anand Publications, 1993.
5. Dube, S.C. India Since Independence : Social Report on India, 1947-1972, Bombay: Vikas Publishing House, 1977.
6. Sharma.Y.K., Indian Society: Issues and problems. Agra:Lakshki narain agarwal , 2007.
7. Rao, Shankar C.N Sociology of Indian society, New Delhi: S.Chand & Company Ltd., 2007.
8. Ramnath sharma., Indian society, Bombay: Media promoter and publishers pvt.Ltd..1999.
9. Rao, Shankar C.N. An introduction to sociology, New Delhi: S.Chand & Co., 1960

B.A. SOCIOLOGY FOURTH SEMESTER

Allied Subject – 4- SOCIOLOGY OF EDUCATION (Hours-6 & Credits-5)

UNIT – I – EDUCATION:

Education: Meaning and Aims. Types of Education: Formal, Informal and Non-formal. Socialization and education: inter-relationship. Role of family, peer group and School in Socialization and Education.

UNIT – II – EDUCATION AS A SOCIAL VARIABLE:

Education and Social Control. Education and Social Mobility. Education and Social Change. Education and Modernization. Education for citizenship. Education for Democracy.

UNIT – III – EDUCATION IN INDIA:

History of Indian Education: Education in the Ancient Period, Medieval period, Colonial period and Post Independence Period. Modern Trends. Educational Structure from Primary Level in Contemporary Period. Nursery schools and their place in the educational structure. Factors in their rise and growth.

Distance and Continuing Education Centers: Their objectives and contribution to the Development of Education.

UNIT – IV – EDUCATIONAL LEVEL OF SPECIFIC SECTIONS:

Education in Rural Areas: Level of Education in Rural Areas. Factors Responsible for it. Corrective measures and Incentives provided to Rural Students in promoting their Education.

Education and Scheduled Castes and Scheduled Tribes: Educational level of students from SCs and STs. Incentives provided to them for improving their Educational Level.

Education and Women: Importance of Women's Education in India. Educational status of women and factors associated therewith. Measures taken and Incentives provided for Improving Women's Education by the Government.

UNIT – V – ISSUES AND PROBLEMS IN EDUCATION:

- a. Budgetary Allocation for education. Compulsory education for Children. Subsidization in Higher Education. Starting of Self-financing Colleges.
- b. Dropout. Educated unemployment. Brain Drain.

BOOKS FOR REFERENCE

1. Ivour, Morrigh. **The Sociology of Education: An Introduction**, London: Geroge Allen and Unwin, 1978.
2. Brown, Franus.J. **Educational Sociology**, Bombay: Asia Publishing house, 1961.
3. Ballantine, Jeanne H. **The Sociology of Education**, 3rd ed. Englewood chits, New Jersey: Prentice Hall, 1989.
4. Gore, M.S., Desai.I.P. and Chitris, Suma. eds. **Papers in Sociology of Education**, New Delhi, National Council of Educational Research and Training, 1967.
5. Aggarwal, J.C., **Theory and Principles of Education: Philosophical and Sociological Bases of Education**, 2nd ed. New Delhi: Vikas Publishing House, 1982.
6. Sharma, Ram Nath and Sharma, Rajendra K., **Sciology of Education**. Bombay: Media Promoters and Publishers, 1985.

M.S.University B.A. Degree Sociology Syllabus under New CBCS Scheme
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B.A. SOCIOLOGY FIFTH SEMESTER

(Core Subject – 7) - INDIAN SOCIAL INSTITUTIONS (Hours – 7 & Credit – 5)

UNIT-I- FACETS OF INDIAN SOCIETY

Facts of Indian Society: Demographic Profile: Sex, Age, Literacy Level, and Marital Status, Religious Composition, Linguistic Groups and Occupational Distribution.

UNIT-II- CASTE SYSTEM

Caste System: Concept of Varna, Jati and Gotra. Theories of the Origin of Caste System. Features of Caste System. Caste Elements Among the Muslims and Christians. Contemporary Trends in Caste System.

UNIT-III- MARRIAGE

Marriage among Hindus: Hindu view of Marriage. Traditional Forms. Divorce. Changing trends.

CMarriage among Muslims: Muslim view of Marriage. Types. Underlying conditions. Methods of Dissolution of Marriage.

Marriage among Christians: Christian view of Marriage. Procedures Involved in Marriage. Divorce.

UNIT-IV- FAMILY

Meaning. Types. Characteristics of Joint Family. Changing Trends in Family.

UNIT-V- SCHEDULE CASTES AND SCHEDULED TRIBES

Schedule Castes: Problems. Legal Provisions. Welfare Measures. Changes among Scheduled Castes. Scheduled Tribe: Problems. Legal provisions. Welfare Measures. Changes among Scheduled Tribes.

BOOKS FOR REFERENCE

1. Ghurye, G.S. **Castes and Race in India**. 3rd ed. Bombay, Popular Prakashan, 1969.
2. Kapadia, K.M. **Marriage and Family in India**. Bombay: Oxford University press, 1966.
3. Srinivas, M.N. **Caste in Modern India and Other Essays**. Bombay: Asia Publishing House, 1962.
4. Singh, Yogendra, **Social Change in India: Crisis and Resilience**. New Delhi: Har-Anand Publications, 1993.
5. Dube, S.C. **India Since Independence : Social Report on India, 1947-1972**, Bombay: Vikas Publishing House, 1977.

B.A. SOCIOLOGY FIFTH SEMESTER

Core Subject - 8 – RURAL SOCIOLOGY- (Hours – 7 & Credit – 5)

Unit – I - RURAL SOCIOLOGY

Definition. Nature. Scope. Aims. Characteristics of Rural Society. Origin of Rural Sociology in India. Importance of Rural Sociology in India.

Unit – II – AGRAIRIAN STRUCTURE

Land Tenure Patterns: Zamindari system and Rayatwari system. Present land tenure pattern and land distribution. Village Community: Definition. Features and types. Sociological Importance of Village Communities in India.

Unit – III – RURAL ECONOMY STRUCTURE

Features of Rural Economy. Importance of Rural Economy. Problems of Indian Agriculture. Landless Agriculture Laborers: Their problems. Government measures to protect and uplift them. Impact of Green Revolution. Cottage industries: Handicrafts. Machine crafts. Importance of Cottage Industries in Indian economy.

Unit – IV -RURAL POWER STRUCTURE:

Traditional Power Structure.; Traditional Village Panchayat, Caste panchayat: Its composition and Functions. Modern Statutory Panchayat: Its Organization, Functions and Problems. Changes brought about by it . Emerging pattern of Leadership.

Unit – V – COMMUNITY & RURAL DEVELOPMENT

i. Community development programme: Meaning. Aims & Objectives. Implementation and achievement. Evaluation of the community development programme.

ii. Rural Development Programme:Meaning. Main components of Rural Development. Aspects of Rural Development. Important Rural Development programmes:IRDP,NREP,TRYSEM,,ANTYODYA,RLEGP,JRY,SFDA,FFWP,DDP,DPAP,EAS,JGSY,SGSY,PMRY.

1. Deasi, A.R., **Rural Sociology In India**. Bombay:Popular Prakashan, 1969.
2. Chitamber, J.B., **Introductory Rural Sociology**.New York: John Wiley & Sons, 1973.
3. Beteille, Andre, **Studies In Agrarian Structure**. New Delhi: Oxford University press, 1974.
4. Desai, Vasant., **Rural Development**. 6 vols. Bombay: Himalaya publishingHouse, 1986.
5. Sharma R.K. **Rural sociology**, New Delhi:Atatlantic Publishers & distributors,2004.

B.A. SOCIOLOGY FIFTH SEMESTER

Elective Subject -1- SOCIOLOGY OF HEALTH (Hours – 6 & Credit – 5)

UNIT-I- HELATH

Concept of Health. Ill-health. Dimensions of Health. Determinants of health. Holistic Health. Occupational health.

UNIT-II- HYGINE

Concept of Hygiene. Personal Hygiene, Residential Hygiene and Community Hygiene. Hygiene and Environment.

UNIT-III- COMMUNITY HEALTH

Concept of Community Health. Need for Community Health. Promotion of Community Health. Role of Primary Health Centres.

UNIT-IV- HEALTH EDUCATION

Aims. Content. Principles. Methods used in Health Education.

UNIT-V- HEALTH CARE SERVICES

Health policy India. Health Care Systems: Siddha, Ayurveda, Homeopathy and Allopathy.

BOOKS FOR REFERENCE

1. Albrech, Gray L. Advances in Medical Sociology. Mumbai: Jai Press, 1944.
2. Gunatillake, G. Intersectoral Linkages and health Development: Case Studies in India (Kerala State), Jamaica, Norway, Sri Lanka and Thailand (WHO offset series) Geneva: WHO, 1984.
3. Rao, Mohan. Disinvesting in Health: The World Bank's Prescription for Health. New Delhi: Sage, 1999.
4. Schwatz, Howard. Dominant Issues in Medical Sociology, New York: MCGraw Hill, 1994.
5. Scramber, Graham and PaUL Higgs, Modernity, Medicine and Health: Medical Sociology Towards 2000, London: Routledge, 1998.
6. Albrecht, Gray L. and Fitzpatrick, R. Quality of Life in Health Care: Advances in Medical Sociology. Mumbai: Jai Press, 1994.
7. Coe. Rodney M. Sociology of Medicine. New Jersey: Prentice Hall, 1997.
8. Cockerham, William C., Medical Sociology, New Jersey; Prentice Hall, 1997
9. Cockerham, William C., Readings in Medical Sociology, New Jersey; Prentice Hall, 1997.
10. Conard, Peter et al. Handbook of medical Soiciology, New Jersey; Prentice Hall, 2000.
11. Dasgupata,.R. Natritional Planning in India. Hyderabad, NIN, 1993.

B.A. SOCIOLOGY FIFTH SEMESTER

Elective Subject -2- SOCIAL GERONTOLOGY (Hours – 6 & Credit – 5)

UNIT – I – SOCIAL GERONTOLOGY

Concept. Importance of the study. Scope. Ageing Process: Biological, Psychological, and social Dimensions.

UNIT – II – AGED IN CONTEMPORARY INDIA

Nature. Extent of Aged Population and Their Economic Activities. Their Retirement and Leisure.

UNIT – III- PROBLEMS OF THE AGED

Housing and Elderly. Healthcare and Elderly. Factors Influencing the Problems of Aged.

UNIT – IV- CARE FOR AGED

Family Care and Aged. Institutional Care and Aged. Social Consequences of the Aged in the absence of care.

UNIT – V- Welfare of aged

Need. Welfare Services Provided by the Government. Role of Non-Government Organisation.

BOOKS OF REFERENCE

1. Paul Chowdhry D. Aging and the Aged. New Delhi, Inter: India publication, 1962.
2. Bose, A.B. & K.D. Gangrade. Aging in India: Problems and potentialities, New Delhi, Abhinay publications, 1988.
3. Desai, K.C., Aging in India. Bombay: Tata Institute of Social Sciences, 1982.
4. D' Souza, Alfred & Water Fernandes. Aging in South Asia: Theoretical Issues of Policy Implications. New Delhi: Indian Social Institute, 1982.

B.A. SOCIOLOGY FIFTH SEMESTER

(Elective Subject – 3) N.G.O. MANAGEMENT (Hours – 6 & Credit – 5)

UNIT – I

NGO's – Concept and Theories, Structure and functions, Characteristics, Classification of NGO'S

UNIT – II

Origin and growth of NGO'S in India. Objectives formation of NGO's – Steps. Procedures and specific legal requirement. Financial Resources: Government, Non-government, Corporate and community support. Management and principles of NGO'S. Originational factors. Strategies of Social Action adopted by NGO'S

UNIT – III

Management and Principles of NGO'S. Organizational Factors. Strategies of Social Action Adopted by NGO'S.

UNIT – IV

Project Management and Planning: Project: Definition, Features, Ttypes, Classification, Phases. Project Management: Concept. Steps. Benefits. Project Planning: Meaning. Features. Functions. Steps.

UNIT – V

NGO's and Development. Rural Development. Poverty Alleviation. Protection to Child Rights. Helth Care. Environmental Protection.

BOOKS FOR REFERENCE

1. Shivani dharmarajan, **NGO's as prime movers**. New Delhi: Kanishka publishers, 2001.
2. Anju Bhatia, **Women's Development and NGO**. New Delhi: Rawat publication, 2000.
3. Chandra, **NGO-Governmental Organizations, Structure relevance and function**. New Delhi: Kanishkka publishers, 2001.
4. S.T. Lalvani, **NGO's and rural Development**. New Delhi: Rawat publications, 1999.
5. Puran Chandra, **NGO's in India, Role Guidelines and performance appraisal**. New Delhi: Akansha Publishing house, 2005.
6. Nagarajan.K, **Project management** New Delhi: New age international, 2001.
7. Vasant Desai, **Project Management Himalaya Publishing House**. Mumbai: 1997.
8. Narendra Singh, **Project Management and control**. Mumbai: Himalaya publishing house, 1998.

B.A. SOCIOLOGY FIFTH SEMESTER

**Skilled Based subjects -3-PERSONALITY DEVELOPMENT -
(Hours -4 &Credit- 4)**

UNIT - I

PERSONALITY-Definition-determinants - personality Traits - Theories of personality - Importance of Personality Development. **SELF AWARENESS** -Meaning-Benefits of Serlf – Awareness-Developing Self-Awareness. **SWOT**-Meaning - Importance-Application - Components.**GOALSETTING**-Meaning –Importance - Effective goal setting-Principles of goal setting-Goal setting at the Right level.

UNIT - II

SELF MONITORING-Meaning - High self-monitor-Sef-monitoring and job performance. **PERCEPTION**-Definition-Factors influencing perception-Perrception process - errors in perception - Avoiding perceptual errors. **ATTITUDE** – Meaning- Formation of attitude-Types of attitude-Measurement of Attitudes-Barriers to attitude change-Methods to attitude change. **ASERTIVENESS**-Meaning-Assertiveness in Communication-Assertiveness Techniques-Benefits of being Assertive-Improving assertiveness.

UNIT - III

TEAM BUILDING – Meaning – Types of teams – Importance of Team building – Creating Effective Team. **LEADERSHIP** – Definition – Leadership style – Theories of leadership – Qualities of Effect leader. **NEGOTIATION SKILLS**- Meaning- principles of Negotiation-Types of Negotiation- The Negotiation process- Common mistakes in Negotiation process. **CONFLICT MANAGEMENT**- Definition- Types of Conflict- Levels of conflict- Conflict Resolution- Conflict management.

UNIT - IV

COMMUNICATION-Definition- importance of communication - process of communication-communication symbols - Communication network-Barriers in communication - Overcoming Communication Barriers. **TRANSACTIONAL ANALYSIS**-Meaning – EGO states -Types of Transactions-johari Window-OLife positons. **EMOTIONAL INTELLIGENCE** - Meaning-Components of Emotional Intelligence. Significance of managing. Emotional Intelligence - How to develop Emotional Quotient. **STRESS MANAGEMENT**- Meaning-Sources of Stress- Symptoms of Stress- Consequences of Stress- Managing Stress.

UNIT - V

SOCIAL GRACES- meaning- Social Grace at work – Acquiring Cocial Graces. **TABLE MANNERS** – Meaning – Table Etiquettes in Multicultural Environment – Do’s and Don’s of Table Etiquettes. **DRESS CODE** – Meaning- Dress code for selected Occasions – Dress Code for an Interview **GROUP DISCUSSION** – Meaning – personality traits required for Group Discussion – Process of Group Discussion – Group discussion Topics. **INTERVIEW**- Definition – Types of skills – Employer Expectations- Planning for the interview – interview questions – Critical Interview questions.

BOOKS OF REFERENCE

1. Personality Development, M.S. University Publication, Tirunelveli, 2013
2. V.M. SelvaRaj, Personality Development, Bavani Publication, Vilathikulam, 2012

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B.A. SOCIOLOGY SIXTH SEMESTER

Core Subject - 9- INDUSTRIAL SOCIOLOGY -(Hours – 6 & Credit –5)

Unit – I- INDUSTRIAL SOCIOLOGY

Meaning and scope. Industry: concept. Industry and factory. History of rise and Development of Industry. Socio-Economic Significance of Industry. Industry as a Social System. Conditions essential for functioning of Industry.

Unit – II –INDUSTRIAL RELATIONS:

Meaning. Aspects and scope of industrial relations. Collective Bargaining: Meaning, principles, phases and forms. Scope of Collective Bargaining in industrial relations. Conditions for successful Collective Bargaining.

UNIT – III-INDUSTRIAL DISPUTES:

Meaning. Forms of industrial dispute: Strikes and lockouts. Types of strikes. Causes and effects of industrial disputes

I. Prevention of Industrial Disputes: Machinery with special reference to India : Works Committee. Joint consultative machinery. Institution of Labour Welfare Officer. Code of Discipline. Standing Orders. Grievance Procedure.

II. Settlement of industrial disputes: Machinery with reference to India: Conciliation Machinery – Conciliation officer, Board of Conciliation and Arbitration Machinery. Labour Court. Industrial Tribunal/ National Tribunal.

Unit – IV -WORKERS PARTICIPATION IN MANAGEMENT:

Workers' participation in Management: Importance. Theoretical basis. Purposes. Levels of participation. Schemes in India. Factors affecting the success of the schemes.

Unit –V-LABOUR WELFARE:

Meaning. Need for Labour Welfare and scope of labour welfare work. Labour welfare activities undertaken by the Government of India, by the Government of Tamil Nadu, by the employers and by the trade unions.

BOOKS FOR REFERENCE

1. Mamoria, C.B., and Mamoria, Satish, **Dynamics of industrial relations**. 2nd new ed. Bombay:Himalaya Publishing House, 1985.
2. Tyagi.B.P., **Labour Economics and Social Welfare**, Meerut: Jaiprakashnath and company, 1980.
3. Sinha, G.P., and Sinha, P.R.N., **Industrial Relations and Labour Legislation**. New Delhi,Oxford & IBH Publishing Co., 1971.

B.A. SOCIOLOGY SIXTH SEMESTER

Core subject -10 - CONTEMPORARY SOCIAL PROBLEMS (Hours-6&Credits-5)

UNIT – I- SOCIAL PROBLEM:

Definition. General Characteristics. Causes. Types. Perspectives of social problems: Social Disorganization Perspective, Value Conflict Perspective, Deviant Behaviour Perspective.

UNIT – II – DRUG AND ALCOHOLISM:

Drug Abuse: Definition. Classification. Extent of the Problem. Causes. Social implications of drug abuse. Measures to treat and prevent drug abuse.

Alcoholism: Meaning. causes and effects of Alcoholism. Measures to treat and prevent alcoholism.

UNIT – III – CHILD LABOUR:

Definition. Causes and Consequences. Effects of the Problem. Legal Measures to eradicate the problem. Child Labour Eradication Programmes in India.

UNIT – IV - AIDS:

Meaning. Extent of the problem. Modes of transmission. Its impact on the affected individual, family and society. Protective and preventive measures.

UNIT – V – TERRORISM:

Concept. Characteristics. Causes and Consequences. Legal Measures for combating the problem.

BOOKS FOR REFERENCE

1. Julin, Joseph, **Social Problems**, New Jersey: Printice-Hall, Englewood Cliffs, 1977
2. Scarpitti, Franx.R., and Anderson, Margaret. L. **Social Problems**, New York: Harper Row, 1989.
3. Merton, Rober K., and Nisbet, Robert.**AContemporary Social Problems**. New York: Harccurt Brace, 1991.
4. Lamert, Edwin M. **Social Pathology**, New York: McGraw-hill Book Company, 1991.
5. Ahuja, Ram., **Social Problems in India**, Jaipur: Rawat Publications, 1992.

B.A. SOCIOLOGY SIXTH SEMESTER

Core subject – 11 – URBAN SOCIOLOGY (Hours- 6 & Credits -5)

Unit – I URBAN SOCIOLOGY:

Meaning. Nature. Scope. Importance of Urban Sociology. Concepts of Urbanism and Urbanization. Rural and Urban Dichotomy and continuum.

UNIT - II-CITY:

City: Definition. Characteristics. Types of cities. Causes for growth of cities in pre industrial and contemporary India. Factors responsible for urban migrants.

UNIT - III-INDUSTRIALISATION AND CITY:

Social consequences of Industrialization on Urban life: Impact on social relationships, Impact on marriage, Impact on family, Impact on social stratification, Impact on Caste system, impact on morals.

Unit – IV – URBAN PROBLEMS:

Housing problems: Causes and Effects of bad Housing and Steps taken by the government to curb the housing problems. Slums: Causes for the growth of slum.. Pollution: Air, Water and Noise. Crime: Causes and Prevention of crime. Juvenile delinquency: causes and reformation steps. Cyber crime: Meaning, Types. White Collar Crime: Causes and effects.

UNIT – V URBAN PLANNING:

Aims, Objectives, Importance and Fundamentals of Urban Town Planning. Urban developmental programmes of State and central Government.

BOOKS FOR REFERENCE

1. Quinn, James A, **Urban Sociology**. New Delhi: Euraha Publishing House, 1967.
2. Wilson, Roibert A., and Schultz, David A., **Urban Sociology**. New Jersey: Printice-Hall, Englewood Cliffs, 1978.
3. Bose, Ashish, **Urbanization in India**. New Delhi: Academic Books, 1978.
4. Ramachandran, R., **Urbanization and Urban Systems in India**, Delhi: Oxford University Press, 1991.
5. Rajendra k. Sharma, **Urban Sociology**, New Delhi: Atlanti publishers and distributors,1997

B.A. SOCIOLOGY SIXTH SEMESTER

**Core subject -12- SOCIAL REFORM MOVEMENTS IN INDIA
(Hours-6 & Credits-5)**

UNIT-I- SOCIAL MOVEMENT

Meaning. Characteristics. Kinds of social movement. Conditions that bring about social movements. Life cycle of social movements. Functionalist and conflict perspectives on social movements.

UNIT-II- RELIGIOUS MOVEMENTS

Buddhism, Jainism and Sikhism: the contexts in which they arose their principles and preachings. Their impact on the Hindu religion and society. Brahmo Samaj, Arya Samaj, and Sri Ramakrishna Mission: Their principles and programmes of action. Their contribution to the reformation and revitalization of the Hindu religion and society.

UNIT-III- PEASANT MOVEMENTS

Peasant Movements: Emergences of Peasant movements in West Bengal, Peasant movement in Uttar pradesh and peasant movement in Telangana.

UNIT-IV- BACKWARD CLASS MOVEMENT

Dravidian Movement in Tamil Nadu: The context in which it arose. Contribution made by justice party and Periyar Ramaswamy to it. Reservation system for backward classes: Its features at the state and central levels. The principles (Compensatory/Protective Discrimination) underlying it. Present status of Reservation of OBC's in Tamilnadu.

UNIT-V- DALIT MOVEMENT: Atrocities perpetrated against the Dalits, Untouchability: Role of Gandhi, Dr. Ambedkar, Periyar Ramaswamy and Kanshi Ram in the emancipation of Dalits. Impact of Dalit movement in the Indian Society.

BOOKS FOR REFERENCE

1. Wilkinson, P. Social Movements. Londaon: Pall Mall, 1971.
2. Natarajan. S.A. Century of social Reform in India, Madras: Asia Publishing House, 1959.
3. Rao M.S.A., Social Movements in India. Vols. 1 & 2 New Delhi: Manoha Publications, 1979.
4. Dhangare D.N. Peasant movement India, New Delhi: Oxford University Press, 1983.
5. Hardgrave R.I. The Dravidian Movements. Bombay: Popular Prakashan 1965
6. Sumanda, Pawardhan. Social Change among Harijans. New Delhi: Orient Longman, 1973.

B.A. SOCIOLOGY SIXTH SEMESTER

Elective subject -3 - SOCIOLOGY OF SOCIAL WORK (Hours 6 & Credits 5)

UNIT-I- SOCIAL WORK

Meaning. Characteristics. Objectives. Scope. Function. Philosophy. Relationship with sociology, Anthropology, Economics, Psychology, Political science. Genesis of social work: Evolution of social work in U.K. and U.S.A. Development of social work in India: Ancient Period, Medieval Period, British Period, and After Independence.

UNIT-II- CASE WORK

Meaning. Basic assumption of social case work. Principles of case work practices. Aspects of client worker relationship. Nature of social casework. Principles of social case work.

UNIT-III- GROUP WORK

Definition. Characteristics. Functions. Purpose. Principles of social group work. Role of groupworker. Similarities and distinction between casework and group work.

UNIT-IV – COMMUNITY ORGANISATION AND COMMUNITY DEVELOPMENT

I) Community organization : Definition. Features. Social worker and community organization. Activities of community organization in India.

II) Community Development: Definition. Objectives. Philosophy. Principles. Programmes of Community Development. Integrated Rural Development Programme.

UNIT-V- SOCIAL WELFARE ADMINISTRATION

Meaning. Essentials of social welfare administration. Task of social welfare administration. Principles of social welfare. Social welfare and personal administration. Public administration and social welfare administration.

BOOKS FOR REFERENCE

1. Chowdhry.P., **Introduction to social work**, Delhi: Atma Ram & Sons, 2000.
2. Sanjay Bhattacharya and Guru. G, **Social work**, New Delhi: Deep & Deep publication Pvt. Ltd. 2003
3. Madhan.G.R. **Indian Social Problems**, Vol.2, Allied publishers private limited, New Delhi, 2003
4. Sharma. R.K., **Rural Sociology**, New Delhi: Atlantic publishers pvt Ltd., 2004.
5. Das Gupta.S, **Towards a philosophy of Social work in India**, New Delhi: Popular, 2001 

B.A. SOCIOLOGY SIXTH SEMESTER

Elective paper – 3- SOCIOLOGY OF WELFARE (Hours- 6 & Credits -5)

UNIT – I- SOCIAL WELFARE

Concept. Objectives. Scope. Welfare State. Government and non-Government Organizations engaged in social welfare work.

UNIT – II – CHILD WELFARE:

Meaning of childhood. Constitutional provisions for Child Welfare. Welfare service given to orphaned children, street children and child workers.

UNIT – III – WOMEN’S WELFARE:

Need. Welfare programmes for health and self-employment of women. Welfare Programmes for working women, women workers, destitute women and widowed women.

UNIT – IV - WELFARE OF AGED:

Need. Factors influencing the intensity of the problems of aged. Welfare services provided by the Government and non-Government Organisations.

UNIT – V – WELFARE OF PHYSICALLY HANDICAPPED:

Meaning of Physical handicap. Its categories. Magnitude of the problem of physically handicapped. Rehabilitation and welfare services provided by Government and Non-Government Organizations.

BOOKS FOR REFERENCE

1. Muzumdar, Ammu. **Social Welfare in India**. Bombay:Asia Publishing House, 1964.
2. Friedlander, Walter A., and Apte, Robert Z. **Introduction to Social welfare**. New Delhi:Printice-Hall of India,1982.
3. **Encyclopedia of Social Work in India**, Vols I to IV. New Delhi: Ministry of Welfare, Government of India, 1987.
4. Swaminathan, Mina, **Child Care Services in Tamil Nadu**. Madras: M.S. Swaminathan Research Foundation, 1991.

M.S. UNIVERSITY MODEL QUESTION PAPER

B.A.DEGREE SOCIOLOGY EXAMINATION

Third semester – Sociology Main

Time: Three hours

Maximum: 75 marks

SECTION - A – (10 X 1 = 10 marks)

Answer ALL the questions.

ALL Questions carry equal marks.

Choose the correct answer

1. August Comte is a

- (a) British Evolutionist (b) German Romantic writer
(c) French positivist (d) American culturologist

2. Social dynamics to Comte, is

- (a) A branch of sociology (b) Social order
(c) Social equilibrium (d) Social problem

3. According to Spencer, Sociology is the study of

- (a) Physical evolution (b) Inorganic evolution
(c) Organic evolution (d) Super organic evolution

4. Spencer classified the society as militant and industrial societies on the basis of

- (a) Political complexity (b) Religious factor
(c) Internal control (d) External control

5. In one of the following conditions, men are dominated by the forces of their own creation

- (a) Progression (b) Alienation
(c) Domination (d) Coercion

6. Karl Marx is

- (a) Russian philosopher (b) British Philosopher
(c) German Philosopher (d) French Philosopher

7. Weber's social action is based on
- (a) Subjective orientation (b) Objectivity
(c) Rationality (d) Verifiability
8. Authority based on exemplary character of individual is called
- (a) Traditional (b) Legitimate
(c) Charismatic (d) None of the above
9. Break down of normative order will result in
- (a) Altruistic suicide (b) Egoistic suicide
(c) Fatalistic suicide (d) Anomic suicide
10. The utilitarian aspect of life is called
- (a) Sacred (b) Profane
(c) White magic (d) Black magic

SECTION – B – (5 X 5 = 25 marks)

Answer ALL the questions in about 200 words each.

ALL Questions carry equal marks.

Choose either (a) or (b)

11. (a) What is positivism? And how is it linked to sociology
- (Or)
- (b) How does Comte differentiate social static and social dynamics?
12. (a) Explain the Primary Principles of social evolution
- (Or)
- (b) Explain Spencer's Science of sociology
13. (a) What are the characteristics of Ideal types?
- (Or)
- (b) Explain the Weber's typology of social action

14. (a) Explain the basis for class consciousness

(Or)

(b) Explain the meaning of alienation with a suitable example.

15. (a) Explain the reasons for egoistic suicide.

(Or)

(b) Elucidate 'Social fact' of Durkheim

SECTION – C – (5 X 8 = 500 marks)

Answer ALL the questions in about 600 words each.

ALL Questions carry equal marks.

Choose either (a) or (b)

16. (a) Discuss Comte's law of Three Stages.

(Or)

(b) Examine Comte's Scheme of hierarchy of science

17. (a) Elaborate Spencer's typology of societies

(Or)

(b) Highlight Spencer's attempt to draw a parallel between society and organism.

18. (a) Write an essay on "Marx's theory of social change"

(Or)

(b) Explain Marx's materialistic interpretation of history.

19. (a) Critically examine Weber's approach to Bureaucracy.

(Or)

(b) Bring out the relation between economy and religion as portrayed by Weber.

20. (a) Examine Durkheim's theory of social solidarity

(Or)

(b) Discuss Durkheim's theory of religion

APPENDIX - AZ41

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI BACHELOR OF BUSINESS ADMINISTRATION

Syllabi and scheme of examination for those who joined the Academic year 2012 – 2013

Semester	Subjects	Max. Marks			Passing Min		
		External	Internal	Total	External	Internal	Total
III.	Core Subjects (3 Courses)						
	1. Principles of Management	75	25	100	30		40
	2. Business Law	75	25	100	30		40
	3. Financial Accounting	75	25	100	30		40
	Allied – II – (1)						
	Fundamentals of Computer for Business	75	25	100	30		40
	Skill based Subject (1 Course)						
	1. Managerial Skill Development	60	40	100	24		40
Non – major Elective I (1 Course)							
1. Banking Practice	75	25	100	30		40	
IV.	Core Subjects (2 Courses)						
	1. Cost Accounting	75	25	100	30		40
	2. Industrial Law	75	25	100	30		40
	Major Elective (1 Course)						
	1. Financial Services	75	25	100	30		40
	Allied Subject II (1 Course)						
	1. Fundamentals of Computer for Business	75	25	100	30		40
	Skill based Subject (1 Course)						
	1. Banking Practice	60	40	100	24		40
	Non – major Elective II (1 Course)						
1. Entrepreneurial Development	75	25	100	30		40	

Semester	Subjects	Max. Marks			Passing Min		
		External	Internal	Total	External	Internal	Total
V.	Core Subjects (3 Courses)						
	1. Case Analysis – I	60	40	100	24		40
	2. Marketing Management	75	25	100	30		40
	3. Production Management	75	25	100	30		40
	Major Elective (One Course)						
	1. Management Accounting	75	25	100	30		40
V.	Skill based Subject (Common) (1 Course)						
	1. Personality Development	60	40	100	24		40
Semester	Subjects	External	Internal	Total	External	Internal	Total
VI.	Core Subjects (4 Courses)						
	1. Case Analysis – II	60	40	100	24		40
	2. Financial Management	75	25	100	30		40
	3. Human Resource Management	75	25	100	30		40
	4. Entrepreneurship	75	25	100	30		40
	Major Elective (1 Course)						
1. Marketing Research	75	25	100	30		40	

COMMON COURSE STRUCTURE FOR B.B.A.

I SEMESTER

	COMPONENTS	HOURS	CREDITS
Part I	Tamil / Other Language (1 Course)	1 × 6 = 6	1 × 3 = 3
Part II	English (1 Course)	1 × 6 = 6	1 × 3 = 3
Part III	Core Subjects (2 Courses)	2 × 5 = 10	2 × 4 = 8
	Allied Subject I (1 Courses)	1 × 6 = 6	1 × 5 = 5
Part IV	Environmental Studies (1 Course)	1 × 2 = 2	1 × 2 = 2
	Total (6 Courses)	30	21

II SEMESTER

	COMPONENTS	HOURS	CREDITS
Part I	Tamil / Other Language (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	Core Subjects (2 Courses)	10	8
	Allied Subject I (1 Course)	6	5
Part IV	Value Based Education (1 Course)	2	2
	Total (6 Courses)	30	21

III SEMESTER

	COMPONENTS	HOURS	CREDITS
Part III	Core Subjects (3 Courses)	18	12
	Allied Subject II (1 Course)	6	5
Part IV	Skill based subject (1 Course)	4	4
	Non – Major Elective (1 Course)	2	2
	Total (6 Courses)	30	23

IV SEMESTER

	COMPONENTS	HOURS	CREDITS
Part III	Core Subjects (2 Courses)	12	8
	Major Elective (1 Course)	6	5
	Allied Subject II (1 Course)	6	5
Part IV	Skill based subject (1 Course)	4	4
	Non – Major Elective II (1 Course)	2	2
Part IV	Extension Activity (NCC, NSS, YRC, YWF)		1
	Total (6 Courses)	30	25

V SEMESTER

	COMPONENTS	HOURS	CREDITS
Part III	Core Subjects (3 Courses)	14	10
		6	6
	Major Elective (1 Course)	6	5
Part IV	Skill based subject (Common) (1 Course)	4	4
	Total (5 Courses)	30	25

VI SEMESTER

	COMPONENTS	HOURS	CREDITS
Part I	Core Subjects (4 Courses)	24	20
Part II	Major Elective (1 Course)	6	5
	Total (5 Courses)	30	25

Total Number of Courses : 34

Total Number of Hours : 180

Total Number of Credits : 140

Notes : Distribution of marks in Theory between External and Internal Assessment is 75:25 Pass minimum of 40% for external and overall components.

III SEMESTER

CORE SUBJECTS – 3 COURSES

CORE – I PRINCIPLES OF MANAGEMENT

Unit I : INTRODUCTION – PRINCIPLES AND THINKERS

Definition – Nature, Principles Functions and Levels – Features of Management – Administration Vs Management – Management – a Science or an Art or a Profession –Pioneers of Modern Management – F.W. Taylor – Henry Fayol – Elton Mayo – M.P. Follet.

Unit II : PLANNING

Planning – Meaning – Characteristics – Planning Process – Types of Plans – **Forecasting** – Elements – Techniques – **Decision-making** – Definition – Nature Types of Decisions – Process.

Unit III : ORGANISING

Organising – Meaning – Principles of Organising – Forms of organizational structure – **Departmentation** – Factors determine Departmentation – Methods – **Span of Management** – Types – Concepts of Authority and responsibility – **Delegation of Authority** – Centralisation Vs – Decentralisation.

Unit IV : STAFFING

Staffing – Meaning – Manpower Planning – Objectives – Steps – Recruitment – Sources – Selection – **Training** – **Performance Evaluation** – Executive Development.

Unit V : DIRECTING AND CONTROLLING

Directing – Definition – Principles and Elements. **Communication** – **Leadership** – Motivation. **Controlling** – Steps in Controlling – Essentials – Techniques.

Text Book :

1. Principles and Practices of Management – Sixth Edition – 2001 Sultan Chand and Sons – L. M. Prasad
2. Principles of Management – T. Ramasamy

Reference Books

1. Management – Herold Koontz, Weihrich
2. Management – James A.F. Stoners – R. Edward Freeman
3. Principles of Management – Prentice Hall of India (P) Ltd. – Govindarajan and Natarajan

CORE – II – BUSINESS LAW

Unit I

Contracts – offer – Acceptance, consideration, capacity to contract.

Unit II

Mistake, Misrepresentation, coercion, undue influence – Fraud.

Unit III

Legalisation of consideration, object, performance of contract, Discharge of contract, quasi contract – Remedies for breach of contract.

Unit IV

Law of indemnity and guarantee, Bailment, Pledge.

Unit V

Sale of goods, Agency and Partnership.

Reference Books:

1. Mercantile Law – N.D. Kapoor
2. Hand book of Mercantile Law – Venkatesan

CORE – III – FINANCIAL ACCOUNTING

Unit – I

Definition of account – concept and convention – Books of accounts – theory of double entry book keeping, Trial Balance – Rectification of errors.

Unit – II

Final Accounts – Trading a/c – Profit and Loss a/c – and Balance Sheet – Distinction between capital and Revenue Expenditure.

Unit – III

Depreciation – meaning – need – methods of depreciation – provisions, Reserves and Reserve funds.

Unit – IV

Receipts and payment a/c – Income and Expenditure a/c and Balance Sheet.

Unit – V

Single entry – definition and defects – Ascertainment of profit – Conversion of single entry into double entry – simple problems

Reference Books:

1. Advanced Accounts – M.C. Shukla, T.S. Grewal
2. Advanced Accountancy – R.L. Gupta
3. Financial Accounting and Managerial Perspective – Narayanasamy
4. Financial Accounting for Business Managers – Bhattacharyya
5. Financial Accounting – S.N. Maheswari, S.K. Maheswari

ALLIED – II – (1)

FUNDAMENTALS OF COMPUTER FOR BUSINESS

UNIT – I. Introduction to Computer

Computer - Characteristics of Computer – Generations of Computer - Basic Applications of Computer – Architecture of Computer – Computer Memory - Input and Output Devices – Storage Devices – Classifications of Computers - Concepts of Hardware and Software.

UNIT – II. Operating Systems

Operating Systems – Definition – Basic Organisation – Functions of Operating Systems – Types of Operating Systems – Multiprocessing – Multiprogramming – Batch Processing – Time Sharing, Introduction to DOS – Basic utilities of DOS – DOS Commands.

UNIT – III. Introduction to Windows

Windows – Desktop and its elements – Getting started with Windows – Windows Explorer – Viewing of Files, Folders and Directories, Creating and Renaming of files and folders - Running an Application – Windows Setting – Control Panel, Wall paper, Screen saver, Setting date and time, Creating Shortcuts, Windows Accessories.

UNIT – IV. Elements of Word Processing

Introduction to Word Processing – MS Word – Creating, Opening and Saving a Document – MS Word Menu bar – Creating and Formatting of Text – Paragraph, Text Selection, cut, Copy, Paste, Font Selection, Text Alignments, Bullets and Numbering, Tab and Tab setting – Table Manipulation – Draw table, Changing cell width and height, Delete/Insert row and column – Printing a Document – Print preview, printing a selected page.

UNIT – V. Computer Communication & Internet

Basics of Computer Networks – Uses of Network, Common Types of Network – Internet – Concepts and Application of Internet, Services on Internet, WWW, Email, Communication on Internet.

Reference Books

1. Introduction to Computer – Peter Norton, Sixth Edition.
2. Introduction to Computer – Velmani.P, Lakshmi Praba.V
3. Computer Fundamentals – P.K. Sinha,
4. Data Processing and Information Technology – C.S. French

SKILL BASED SUBJECT – I COURSE

1. MANAGERIAL SKILL DEVELOPMENT

Unit – I

Managerial Skills – Technical, Human Relations, Conceptual Skills – Managerial Environment – Human and Non – Human factors – Applicative domains of Managerial Skills.

Unit – II

Communication Management : Types – Verbal and Non-Verbal Communication – Meta Communication – Non Verbal behaviour – Body language on Kinesics behaviour, Touching behaviour – Physical characteristics, paralanguage and proxemics.

Unit – III

Expressions and Emotions – Managing Emotions – Types – Face and expression of emotions – Emotional Intelligence.

Unit – IV

Stress Management : Stress – types, stressors, coping strategies or techniques – Role conflict – conflict management styles – Role play, Johari window – Transactional Analysis (TA).

Unit – V

Conducting meetings – preparing Agenda – minutes and resolutions – Conducting seminars and conference – oral presentation – Group Discussion – Reports – Format procedure.

Reference Books:

1. Organisational Behaviour – Stephen P. Robbins
2. Organisational Behaviour – Fred Luthans
3. Organisational Behaviour – K. Aswa Thappa
4. Non – Verbal Communication – K.L. Knapp
5. Commercial Correspondence and Office Management – R.S.N. Pillai and Bagavathi

NON – MAJOR ELECTIVE – I

1. BANKING PRACTICE

1. Loans and Advances – Principles of Sound lending – Secured and unsecured advances – Forms of Advances.
2. Modes of charging security – Lien – Pledge – Mortgage – Assignment – Hypothecation
3. Electronic Banking – Traditional Vs E. Banking – Facts of E. Banking.
4. E. Banking Transactions – Models for E. Banking.
5. Advantages of E. Banking – Constraints in E. Banking – Security Measures.

Reference Books:

1. Banking Law and Practice – Gorden and Natarajan
2. Banking Law and Practice – Varshney
3. Banking Law and Practice – Davar

IV – SEMESTER

CORE SUBJECTS – 2 COURSES

CORE – I – COST ACCOUNTING

Unit – I

Cost Accounting, Nature, Meaning and importance – limitations of financial accounting – cost accounting Vs Financial accounting – Advantages and limitation of cost Accounting – Costing system, cost center – cost reduction – Cost control – Methods, types and classification of costs.

Unit – II

Materials control – Objectives – Purchase control – Centralised and decentralized purchase – stock levels and Economic order quantity – ABC analysis – Bin card – Stores ledger – Material issues – FIFO, LIFO, Simple average and weighted average methods.

Unit – III

Labour, Direct and indirect labour – control of labour cost – labour turnover – Methods of wage payments – Premium and Bonus plans.

Unit – IV

Overhead – Meaning, Allocation and Apportionment – Importance – Classification – Reapportionment – Absorption of overheads, Methods, Machine Hour rate – Administration overhead – Selling and distribution overhead.

Unit – V

Unit or output costing – Features – Collection of Costs – Cost Sheet – Production Account – Tenders or quotations – Profit Reconciliation statement – Job, Batch and contract costing.

Reference Books:

1. Cost Accounting – Jain and Narang
2. Cost Accounting – S.P. Iyengar
3. Cost Accounting – R.S.N. Pillai and Bagavathi
4. Cost Accounting – T.S. Reddy and Y. Hari Prasad Reddy

CORE – II – INDUSTRIAL LAW

Unit – I

Factories Act 1948; Workmen Compensation Act 1923.

Unit – II

Payment of wages Act 1936
Minimum Wages Act 1948
The Maternity Benefit Act 1961.

Unit – III

Employee's Provident Fund and Miscellaneous Provisions Act 1952
Employee's State Insurance Act 1948.

Unit – IV

The Industrial Disputes Act 1947
The Payment of Bonus Act 1965
The Payment of gratuity Act 1972.

Unit – V

Trade Unions Act 1926
The Industrial Employment (Standing Order) Act 1946

Reference Books:

1. 'Mercantile Law' – N.D. Kapoor – Sultan Chand Company
2. 'Hand book of Mercantile Law – Venkatesan

MAJOR ELECTIVE COURSE

1. FINANCIAL SERVICES

Unit – I

Financial Services – Concept, objectives / Functions, characteristics. Financial Services Market – Problems of Financial Services Sector. Growth of Financial Services in India.

Unit – II

Commercial banking and their fund based and Non fund based financial services, leasing, Hire purchases – salient features, guidelines – functions.

Unit – III

Mutual funds – Types of Mutual Funds, Floatation, Asset Management company mutual funds Regulations – Consumer finance – credit and ATM / Debit cards.

Unit – IV

Factoring – Forfaiting, Venture Capital, Salient features – guidelines – functions, strategies involved in financing.

Unit – V

Merchant banking – credit rating services. Salient features – guidelines – functions.

Reference Books

1. Financial Management – Dr. Prasanna Chandra
2. Investment Management including Securities Market – Dr. Avadani
3. Merchant Banking – Dr. Varma
4. Financial Markets & Services – Gordon & Natarajan
5. Financial Service – Dr. S. Gurusamy

ALLIED SUBJECT – II (1 COURSE)

Fundamentals of Computer for Business

UNIT – I. MS – Excel

Elements of Spread Sheet - Application/usage Spread Sheet, Opening of Spread Sheet, menu bar, Creation of cells and addressing of cells, Cell inputting, Manipulation of cells, Enter texts numbers and dates - Creation of tables - Cell Height and Widths, Copying of cells, Providing Formulas, Sum function, Average, Percentage - Other basic functions.

UNIT – II. MS – Powerpoint

Basics - Difference between presentation and document - Opening a Power Point Presentation - Creation of Presentation, Title, Text Creation, Fonts and Sizes, Bullets and indenting, Moving to Next Slide - Preparation of Slides, Selection of type of Slides, Importing text from word documents, Slide manager - Slide Designs and Backgrounds - Slide Manipulation and Slide Show - Presentation of the Slides - Using the Slide Show.

UNIT – III. MS – Access

Starting Access - Access Startup Dialog Box - Menus and Toolbars - Using Toolbar Buttons - Creating an Access Database and Tables - Database Properties - Modifying Tables - Creating Forms - Entering and Updating Data Using Forms - Navigating between Records in a Form - Editing and Deleting Data in a Form

UNIT – IV. E-Commerce

An overview of E- Commerce- Types of E Commerce Solutions- Direct Marketing and Selling, Supply Chain Integration, Applications of E- Commerce- Application of E-Commerce in Direct Marketing and Selling, Supply Chain Management, Obstacles in adopting E-Commerce Applications, Future of E Commerce.

UNIT – V. Application of Computer in Management

Computer and Management Information System – Role of Management Information System in Business Organisation – Types of Management System - Transaction Processing System, Decision Support System, Executive Information System, Expert System – Applicative areas of Management Information System.

Reference Books

1. Data Processing and Information Technology – C.S. French
2. Microsoft Access Step by Step – Prentice Hall of India
3. Doing Business on the Internet E-COMMERCE – S. Jaiswal,
4. Management Information System – W.S. Javadekar

SKILL BASED SUBJECT – (1 COURSE)

1. BANKING PRACTICE

Unit – I

Banker and Customer : Meaning – Definition – General and Special relationship between Banker and Customer – Functions of bank.

Unit – II

Types of deposits – Pass book – negotiable instruments – cheque, definition – difference between cheque and Bill of Exchange, endorsement, crossing, marking, material alteration.

Unit – III

Loans and Advances – Principles of Sound lending – secured and unsecured advance – forms of Advances.

Unit – IV

Modes of charging security – Lien – Pledge – mortgage – Assignment – Hypothecation.

Unit – V

Electronic Banking – Traditional Vs E – Banking – Types of E – Banking – Advantages – Constraints.

Reference Books:

1. Banking Law and Practice – Gorden and Natarajan
2. Banking Law and Practice – Davar
3. Banking Law and Practice – Varshey
4. Banking Law and Practice – Tandon

NON – MAJOR ELECTIVE – II (1 COURSE)

1. ENTREPRENEURIAL DEVELOPMENT

Unit – I

Entrepreneurship – Entrepreneurship and economic growth – Qualities of an entrepreneur.

Unit – II

Identification of opportunities – Steps in setting up of a business – Setting up a Small – scale unit.

Unit – III

Institutional arrangement for Entrepreneurship Development – DIC, ITCOT, SIDCO, NSIC, SISI, TIIC, SIDBI, Commercial Banks

Unit – IV

Project report – Project identification – Contents of a project report.

Unit – V

Women Entrepreneurship.

Reference Books:

1. Entrepreneurial Development – Dr. C.B. Gupta, Dr. N. Srinivasan
2. Entrepreneurial Development Principles, Policies and Programmes – P. Saravanavel
3. Dynamics of Entrepreneurial Development in India – Vasanth Desai

V SEMESTER

CORE SUBJECTS (3 COURSES)

CORE- I CASE ANALYSIS – I

One case per week is to be discussed by the students. The cases could be from different functional areas of management.

The students would be provided with the caselets. They would discuss the 'case' in groups. The teacher would guide and facilitate group discussions so as to impart, develop and hone the GD skills.

Since this subject focuses on developing GD skills, the scheme of Examination has two main components and respective sub – components and marks. The marks are to be distributed as follows.

Components	External	Internal (40 Marks)				Test	Assignment
	(3 hours Examination)	Skill Components					
		Communication Skill	Leadership Skill	Inter – personal Skill			
Marks	60	5	5	5	20	5	
Total	60	15			25		

CORE – 2 MARKETING MANAGEMENT

Unit – I

Marketing – Definition – Nature and Scope – Role of Marketing in India – Concepts of Marketing – Buying motives, Perception, Learning, reference Groups – Consumer Decision Making – Market Segmentation.

Unit – II

Product – Product Classification – Product Planning and Policies – New Product development – Product Modification, Product diversification and product elimination, Branding and Packaging – Product life cycle – Product Positioning.

Unit – III

Pricing – Methods of price determination – Cost oriented Pricing. Demand oriented pricing – Competitive pricing – New Product Pricing – Product line pricing – Geographical pricing – Psychological pricing – Price discounts.

Unit – IV

Channels of Distribution – Channel Functions – Factors to be considered in channels selection – Motivations Channel Members – Retailing and Wholesaling.

Unit – V

Advertising – Objective – Advertising as a process of communication – Types of Advertising – Advertising budgets – message design – media selection – sales promotion and types.

Suggested Readings:

1. Fundamental of Marketing – William J. Stanton
2. Marketing Management – Philip Kotler
3. Marketing Management (In the Indian Context) – V.S. Ramasamy and S. Namakumari

CORE – 3 PRODUCTION MANAGEMENT

Unit – I

Production Management – Definition – Scope – Functions of Production Management – production systems – Job order – Intermittent and continuous Flow Line production – Assembly line production – Automation.

Unit – II

Plant Location – Factors affecting plant Location – Multiplant Location decision – Plant Layout – Principles, Methods of laying out. Types of layout – product – Process and combination layout.

Unit – III

Plant Maintenance – organization for maintenance – Economics of Maintenance – Types of Maintenance – Merits and Demerits – Safety Engineering – Good House Keeping.

Unit – IV

Production planning and control – objectives and Functions – Planning, Routing, Scheduling, Dispatching, Expediting and Follow up – Charts.

Unit – V

Work Study – Method study and work measurement – Flow Process chart – Two handed process chart – Micromotion Study – Time Study Procedure and Techniques – Application of work study techniques.

Suggested Reading

1. Production Management EIWOOD BUFFA (JOHNURTON)
2. Manufacturing Management, FRANKLING G. MOORE – (RICHARD IRWIN)
3. Effective Industrial Management – LUNDY (EURASIA)
4. Production Management – GOEL GUPTA
5. Introduction to work Study – I.L.O.
6. Time and Motion Study – BARNER
7. Time and Motion Study – NADILER
8. Motion and Time Study – MANDEL
9. Production and Material Management – K. Sridharan Bhat
10. Production and Operations Management – Kanishka Badi

MAJOR ELECTIVE (ONE COURSE)

1. MANAGEMENT ACCOUTNING

Unit – I

Management Accounting – Definition – Function – Budgetary Control – definition – Objectives – merits and limitations – Steps in Budgetary Control – Types of Budgets.

Unit –II

Standard costing – definition – Standard Costing and Budgetary control – Merits and limitations – Analysis of Variances – Material, Labour, Overhead and sales variances.

Unit – III

Marginal costing – definitions – merits and limitations. Break even analysis – applications of Marginal costing.

Unit IV

Interfirm comparison – meaning – merits and limitations – Ratio Analysis – meaning – types of ratios – merits and limitations.

Unit – V

Reporting for Management – definition – objectives – Types – principles – Methods of reporting.

Note:

Question 50% from Theory
50% from problem

Suggested Readings :

1. Management Account – Manmohan & S.N. Goyal
2. Management Accounting and Financial Control – S.N. Maheswari
3. Cost Accounting – Banerjee
4. Management Accounting – T.S. Reddy and Y. Hari Prasad Reddy.

SKILL BASED SUBJECT (COMMON) – (1 COURSE)

PERSONALITY DEVELOPMENT

UNIT – I

PERSONALITY – Definition- Determinants – Personality Traits – Theories of Personality – Importance of Personality Development. **SELF AWARENESS** – Meaning – Benefits of Self-Awareness – Developing Self-Awareness. **SWOT** – Meaning – Importance – Application – Components. **GOAL SETTING** Meaning – Importance – Effective goal setting – Principles of goal setting – Goal setting at the Right level.

UNIT – II

SELF MONITORING – Meaning – High self-monitor versus low self monitor – Advantages and Disadvantages self monitor – Self-monitoring and job performance. **PERCEPTION** – Definition – Factors influencing perception – Perception process – Errors in perception – Avoiding perceptual errors. **ATTITUDE** – Meaning – Formation of attitude – Types of attitude – Measurement of Attitudes – Barriers to attitude change – Methods to attitude change. **ASSERTIVENESS** – Meaning – Assertiveness in Communication – Assertiveness Techniques – Benefits of being Assertive – Improving Assertiveness

UNIT – III

TEAM BUILDING – Meaning – Types of teams – Importance of Team building – Creating Effective Team. **LEADERSHIP** – Definition – Leadership style – Theories of leadership – Qualities of an Effect leader. **NEGOTIATION SKILLS** – Meaning – Principles of Negotiation – Types of Negotiation – The Negotiation Process – Common mistakes in Negotiation process. **CONFLICT MANAGEMENT** – Definition – Types of Conflict – Levels of Conflict – Conflict Resolution – Conflict management

UNIT – IV

COMMUNICATION – Definition – Importance of communication – Process of communication – Communication Symbols – Communication network – Barriers in communication – Overcoming Communication Barriers. **TRANSACTIONAL ANALYSIS** – Meaning – EGO States – Types of Transactions – Johari Window – Life Positions. **EMOTIONAL INTELLIGENCE** – Meaning – Components of Emotional Intelligence – Significance of managing Emotional Intelligence – How to develop Emotional Quotient. **STRESS MANAGEMENT** – Meaning – Sources of Stress – Symptoms of Stress – Consequences of Stress – Managing Stress

UNIT – V

SOCIAL GRACES – Meaning – Social Grace at Work – Acquiring Social Graces. **TABLE MANNERS** – Meaning – Table Etiquettes in Multicultural Environment – Do's and Don'ts of Table Etiquettes. **DRESS CODE** – Meaning – Dress Code for Selected Occasions – Dress Code for an Interview. **GROUP DISCUSSION** – Meaning – Personality traits required for Group Discussion – Process of Group Discussion – Group Discussion Topics. **INTERVIEW** – Definition – Types of skills – Employer Expectations –Planning for the Interview – Interview Questions – Critical Interview Questions

Reference:

1. Dr. S. Narayana Rajan, Dr. B. Rajasekaran, G. Venkadasalapathi, V. Vijuresh Nayaham and Herald M. Dhas, **Personality Development**, Publication Division, Manonmaniam Sundaranar University, Tirunelveli, 2010.
2. Stephan P. Robbins, **Organisational Behaviour**, Tenth Edition, Prentice Hall of India Private Limited, New Delhi, 2008.
3. Jit S. Chandan, **Organisational Behaviour**, Third Edition, Vikas Publishing House Private Limited, 2008
4. Dr. K. K. Ramachandran and Dr. K.K. Karthick, **From Campus to Corporate**, Macmillan Publishers India Limited, New Delhi, 2010.

VI SEMESTER

CORE SUBJECTS (4 COURSES)

CORE – I CASE ANALYSIS – II

One case per week is to be discussed by the students. The cases could be from different functional areas of management.

The students would be provided with the caselets. They would discuss the ‘case’ in groups. The teacher would guide and facilitate group discussions so as to impart, develop and hone the GD skills.

Since this subject focuses on developing GD skills, the scheme of Examination has two main components and respective sub – components and marks. The marks are to be distributed as follows.

Components	External	Internal (40 Marks)				
	(3 hours Examination)	Skill Components			Test	Assignment
		Communication Skill	Leadership Skill	Inter – personal Skill		
Marks	60	5	5	5	20	5
Total	60	15			25	

CORE – 2 FINANCIAL MANAGEMENT

Unit – I

Nature of financial Management – Objective. Profit Maximisation Vs. Wealth maximization – Function – Financial Decisions – Organisation of the finance.

Unit – II

Sources of Capital – Types of securities, Cost of Capital – Cost of Debt, Cost of Preferred stock, Cost of Equity, Cost of retained earnings and weighted average Cost of Capital. Capital Structure theories: Net Income, Net Operating Income, Modigliani – Miller, Traditional approach.

Unit – III

Working Capital Management – Types of Working Capital – Financing Mix: Hedging, Determinants of Working Capital.

Cash Management : Objectives – Cash Budget Cash Management – Strategies. Receivables Management : Objectives – Credit Policy : Credit terms, Credit Standards and Collection Policy.

Unit – IV

Capital Budgeting : Importance – Process – Evaluation Methods: Payback period, Accounting Rate of Return, Net Present Value, Profitability Index and Internal Rate of Return.

Unit – V

Dividend Decisions: Relevance and Irrelevance of dividend – Walter's Model, Gordon's Model, M.M. Model – Determinants of dividend Policy – Alternatives forms of dividends : Stock dividend and stock split.

NOTES: Questions 50% from Theory
50% from Problem

Reference Books:

1. Financial Management – M.Y. Khan & P.K. Jain
2. Financial Management – I.M. Pandey
3. Financial Management – James C. Van Horne
4. Financial Management – G. Sudarsana Reddy
5. Financial Management – A. Murthy

CORE – 3 HUMAN RESOURCE MANAGEMENT

Unit – I

Human Resource Management – Definition, Concept, Objectives, Characteristics, Functions – Systems approach to personnel Management – Organisational structures.

Unit – II

Human Resource Planning, Job analysis, job description, job specification, Job Evaluation, Recruitment and selection Process.

Unit – III

Training of employees, supervisors and Executives – Promotions – Demotions, Transfer, Absenteeism, Turnover, Reward and Incentives – Performance appraisal.

Unit – IV

Industrial Relations – Definition – Significance Causes for poor industrial Relations Suggestions to Improve Industrial Relations – Labour disputes and Industrial Relations in India.

Unit – V

Workers Participation in Management, Collective Bargaining and Industrial relations – Employee Grievance Procedures & Industrial Disciplinary System.

Suggested Readings:

1. Personnel Management – EDWIN & FLIPPO
2. Personnel Management – C.B.MAMORIA
3. Industrial Relations in India – CHARLESMYERS
4. Labour Problem in India – MAHINDRA

CORE – 4 ENTREPRENEURSHIP**Unit – I**

Entrepreneurship – Meaning – Importance, Types – Role of Entrepreneurs in Economic Development – Qualities of an Entrepreneur – Entrepreneurship as a career.

Unit – II

How to start Business – Product selection – Form of ownership – plant location – land, Building Water and Power – Raw Materials – Machinery – Man Power – Other – Infrastructural facilities – Licensing, Registration and local byelaws.

Unit – III

Institutional arrangement for Entrepreneurship Development – D.I.C. I.T.C.O.T., S.I.D.C.O., N.S.I.C., S.I.S.I., - Institutional Finance to Entrepreneurs T.I.I.C., S.I.D.B.I., Commercial Banks – Incentives to small scale Industries.

Unit – IV

Project Report – Meaning and importance – Project Identification Contents of Project Report – Formulation of a project report – Project appraisal – Market Feasibility – Technical feasibility – Financial Feasibility and Economic Feasibility.

Unit – V

Entrepreneurship Development in India – Women Entrepreneurship in India – Sickness in Small scale industries and their remedial measures.

Reference Books:

1. Entrepreneurship Development in India – Dr. C.B. Gupta, Dr. N.P. Srinivasan
2. Entrepreneurial Development Principles, Policies and Programmes – P. Saravanel
3. Dynamics of Entrepreneurial Development in India – Vasant Desai
4. Fundamentals of Entrepreneurship – Mohanty (PHI)

MAJOR ELECTIVE – (1 COURSE)

1. MARKETING RESEARCH

Unit – I

Marketing Research – Definition – Nature and scope – Problem Definition, Research Design – Exploratory, descriptive, Experimental design.

Unit – II

Data Collection – Secondary data – Primary data – Survey Methods, Questionnaire design, Measurement and Scaling, Observation Method.

Unit – III

Sampling – Type of Sampling – Sample Selection – Data analysis – Classification. Tabulation and Interpretation of data – Report writing.

Unit – IV

Motivation Research Techniques – Sales analysis Research, Methods of Sales Forecasting – Sales potential.

Unit –V

Product research – New Product development – Test Marketing – Advertising Research – copy Testing – Pre – Testing and Post tests – Media Research.

Reference Books:

1. Marketing Research – Boyd and West fall, Richard D. Irwin Inc.
2. Marketing Research – Luck, Wales and Taylor
3. Marketing Research (Principles, Applications and Cases) – Dr. D.D. Sharma

APPENDIX – AZ42

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12.

B.Sc. Degree in Mathematics (CBCS)

(For those who joined the course from the Academic year 2012 – 2013)

1. COURSE OBJECTIVES:

The objectives of the B.Sc. Mathematics course are:

- To enable the students to have a thorough understanding of the concepts and terminologies of mathematical science.
- To motivate the students to solve the problems by applying skills and knowledge gained.
- To inculcate the logical, analytical and critical thinking which in turn provide the confidence to face any competitive examination.
- To facilitate the students of B.Sc Mathematics to become a competent teacher after pursuing their post graduation.

2. ELIGIBILITY NORMS FOR ADMISSION:

Those who seek admission to B.Sc Mathematics course must have passed the Higher Secondary Examination conducted by the Board of Higher Secondary Examination, Tamil Nadu with Mathematics as one of the subjects or a course of study recognized and approved by the syndicate of the Manonmaniam Sundaranar University.

3. TRANSITORY PROVISION:

Candidates admitted to this course of studies, which come into effect from June 2012, should complete the course within six years (before June 2018). Those who fail to complete the course in the afore-said stipulated time have to pass the equivalent papers to be decided by the prospective U.G.Chairman of Board of studies (Mathematics) by the Manonmaniam Sundaranar University.

4. Course structure for B.Sc (Mathematics) under CBCS

Semester I			
	Components	Hours/ week	Credits
Part I	Tamil/ Other languages	6	3
Part II	English	6	3
Part III	Major Paper 1: Calculus	5	5
	Major Paper 2: Algebra	5	5
	Allied I:Paper 1: Physics/Statistics I /Chemistry/Computer Science	6	5
Part IV	Environmental Studies	2	2
	Total(6 Courses)	30	23
Total hours per semester: 450			
Semester II			
	Components	Hours/ week	Credits
Part I	Tamil/ Other language	6	3
Part II	English	6	3
Part III	Major Paper 3: Vector Calculus	5	5
	Major Paper 4: Differential Equations and Fourier Series	5	5
	Allied I:Paper 2: Physics/Statistics II /Chemistry/Computer Science	6	5
Part IV	Value Based Education	2	2
	Total (6 Courses)	30	23

Semester III			
	Components	Hours/ week	Credits
Part I	Tamil/ Other languages	6	3
Part II	English	6	3
Part III	Major Paper 5: Sequences and Series & Trigonometry	6	5
	Allied II: Paper 1: Statistics-I /Physics/Chemistry/Computer Science I	6	5
Part IV	Skill based Subject: Application of Differential equations	4	4
	Non-Major Elective: Statistical Methods	2	2
	Total(6 Courses)	30	22
Total hours per semester: 450			
Semester IV			
	Components	Hours/ week	Credits
Part I	Tamil/ Other language	6	3
Part II	English	6	3
Part III	Major Paper 6: Abstract Algebra	5	5
	Allied II: Paper 2: Statistics-II/ Physics/Chemistry/Computer Science II	6	5
Part IV	Skill based Subject: Numerical Methods	4	4
	Non-Major Elective: Mathematical Models(O.R)	2	2
Part V	Extension Activities (NCC,NSS,YRC,YWF)	1	1
	Total(6 Courses)	30	23

Semester V			
	Components	Hours/Week	Credits
Part III	Major Paper 7: Linear Algebra	7	5
	Major Paper 8: Real Analysis	7	5
	2 Major Electives:		
	Major Paper 9		
	Elective: 1 (any one of the following)		
	1.1. Astronomy	}	5
	1.2. Combinatorial Mathematics		
	1.3. Discrete Mathematics		
	Major Paper 10:		
	Elective: 2 (any one of the following)		
	2.1. Programming in C(Theory + Practical)	}	5
	2.2. Coding Theory		
	2.3. Fuzzy sets and Logic		
Part IV	Skill Based Subject(Common)	4	4
	Total(5 courses)	30	24
Total hours per semester: 450			

Semester VI			
Part III	Major Paper 11: Complex Analysis	6	5
	Major Paper 12: Linear Programming	6	5
	Major Paper 13: Mechanics	6	5
	Major Paper 14: Graph Theory	6	5
	1 Major Elective: Major Paper 15		
	Elective: 3 (any one of the following)		
3.1. Number Theory	}	6	5
3.2. Operations Research			
3.3. Mathematical Programming with JAVA(Theory+ Practical)			
Total(5 courses)	30	25	
Total hours per semester: 450			

Note:

1. Those who have chosen Physics/Chemistry/Computer Science as Allied I in the first year must choose Statistics I and Statistics II as Allied II in the second Year.
2. Those who have chosen Statistics I and Statistics II as Allied I in the first year must choose Physics/Chemistry/Computer Science as Allied II in the second Year.

Total number of courses : 35(Theory 34+Practical 1(Allied: Physics/Chemistry/Computer Science))

Total number of hours : 2700

Total number of credits : 140

Distribution of marks in theory between External and Internal Assessment is **75:25**

For Programming in C and Programming with JAVA, Internal Assessment is as follows:

Test: 15 marks

Practical: 10 marks

Pass minimum of 40% for external and overall components.

Appropriate Major/Allied related, 'Allied Courses' and 'Skill Based Courses' may be chosen by the Major departments, taking into account the total work-load of the department.

5.QUESTION PATTERN:

Duration: 3 hours

Maximum Marks: 75

Part A: (10×1=10)

Objective type-Two questions from each unit.

Part B: (5×5=25)

One question from each unit with internal (either-or) choice.

Part C: (5×8=40)

One question from each unit with internal (either-or) choice.

Non Major Elective

Duration: 2 hours

Maximum Marks: 75

Part A: (20×2=40)

Short answer questions.

Four questions from each unit.

Part B: (5×7=35)

One question from each unit with internal (either-or) choice.

Semester III

Major Paper 5: Sequences, Series and Trigonometry (90 hrs)

Text:

1. Sequences and Series-S.Arumugam and Others.
2. Trigonometry-S.Narayanan and T.K.Manicavachagom Pillay,

Unit 1: Sequences-Bounded Sequences-Monotonic Sequences-Convergent Sequences-Divergent and Oscillating Sequences-The algebra of limits.

(Text 1: Chapter 3: Sections 3.1 to 3.6)

Unit 2: Behaviour of monotonic sequences- Some theorems on limits- Subsequences-Limit points-Cauchy sequences-Cauchy general principle of convergence of series.

(Text 1: Chapter 3: Sections 3.7 to 3.11)

Unit 3: Series-Infinite series-Comparison test-Kummer's Test-D'Alembert's ratio test-Raabe's test-Gauss's test-Root test-Cauchy's condensation test(without proof)

(Text 1: Chapter 4: Sections 4.1 to 4.4)

Unit 4: Alternating series-Leibnitz's test-Absolute Convergence-Multiplication of series-Abel's theorem-Merten's theorem.

(Text 1: Chapter 5: Sections 5.1, 5.2 and 5.5)

Unit 5: Hyperbolic functions-Logarithm of a complex number-Summation of a trigonometric series using $C+iS$ method-Gregory's series.

(Text-2 Chapter IV(full), Chapter V-Section 5, Chapter VI-Section 3)

Skill Based Elective Paper-I (60 Hrs)

Semester III

Application of Differential Equations

Text: Differential Equations and its Applications by -S.Narayanan and T.K.Manicavachagom Pillay,

Unit 1: Application of first order equations-Growth, Decay and Chemical reactions.

(Chapter III: Sections 1)

Unit 2: Flow of water from an orifice-Falling bodies and other rate problems.

(Chapter III: Sections 2 and Sections 3)

Unit 3: The Brachistochrone problem-Simple electric Circuits.

(Chapter III: Sections 4 and 6)

Unit 4: Dynamical problems with variable mass, Application to vibrations in mechanical system.

(Chapter III- Section 7 and Chapter IV-Section 70)

Unit 5: Newton's law of gravitation and motion of planets.

(Chapter IV-Section 8)

Semester III

Non Major Elective Paper I (30 Hrs)

Statistical Methods

Text: Statistics by DR.S.Arumugam

Unit 1: Correlation and Rank Correlation.

(Chapter 6: Section 6.1 and 6.2)

Unit 2: Regression.

(Chapter 6: Section 6.3)

Unit 3: Interpolation-Finite Differences..

(Chapter 7: Section 7.1)

Unit 4: Newton's Formula, Lagrange's Formula.

(Chapter 7: Section 7.2 and 7.3)

Unit 5: Theory of Attributes-Consistency of Data-Independence and Association of Data. (Chapter 8)

Semester IV

Major Paper 6: Abstract Algebra(75 Hrs)

Text: Modern Algebra by Dr.S.Arumugam, Scitech Publications.

Unit 1: Relations and Mappings-Relations-Equivalence relations-Functions.

(Chapter 2: Section 2.1, 2.2 and 2.4)

Unit 2: Groups-Permutation groups-Cyclic groups-Order of an element-Cosets and Lagrange's theorem.

(Chapter 3: Section 3.4, 3.6, 3.7 and 3.8)

Unit 3: Normal subgroups and Quotient groups-Isomorphism-Homomorphism.

(Chapter 3: Section 3.9, 3.10 and 3.11)

Unit 4: Rings-Elementary properties of rings-Isomorphism-Types of rings-Characteristics of a ring-Subring.

(Chapter 4: Section 4.1 to 4.6)

Unit 5: Ideals-Quotient rings-Maximal and Prime ideals-Homomorphism of rings.

(Chapter 4: Section 4.7 to 4.10)

Skill Based Elective (60 Hrs)

Semester IV

Numerical Methods

Text: Numerical Analysis by Dr.S.Arumugam and Isac.

Unit 1: Simultaneous equations-back substitution-Gauss Jordan elimination method-Calculation of inverse of a matrix-Gauss-Seidal iteration Method.

(Chapter 2: Sections 2.1 to 2.5 and 2.7)

Unit 2: Difference operators-Other difference operators-Newton's interpolation-Central Difference Interpolation formula.

(Chapter 3: Section 3.1, 3.2 and Chapter 4: Section 4.1 and 4.2)

Unit 3: Lagrange's Interpolation formula-Divided Difference-Newton's divided difference formula-Inverse interpolation.

(Chapter 4: Section 4.3 to 4.6)

Unit 4: Numerical Differentiation-Newton's forward and backward difference formula- Stirling's formula-Maxima and Minima of the interpolating polynomials.

(Chapter 5)

Unit 5: Numerical Integration-Newton's Cote's Quadrature formula-Trapezoidal rule-Simpson's one third rule-Simpson's three eighth rule-Weddley's rule.

(Chapter 6)

Semester IV

Non Major Elective Paper I (30 Hrs)

Mathematical Models (O.R)

Text: Linear Programming by Dr.S.Arumugam and Others.

Unit 1: L.P.P-Mathematical formulation of a L.P.P.

(Chapter 3: Section 3.1 and 3.2)

Unit 2: Graphical solution of a L.P.P.

(Chapter 3: Section 3.4)

Unit 3: Transportation problem-initial- Basic feasible solutions only(North West Corner Rule-Row minima –Column minima-Matrix minima(Least Cost method).

(Chapter 4: Section 4.1, step I)

Unit 4: Sequencing-Processing n Jobs in 2 machines-Graphical method.

(Chapter 6: Section 6.1)

Unit 5: Processing n Jobs in m machines.

(Chapter 6: Section 6.2)

Semester V

Major Paper 7: Linear Algebra (105 Hrs)

Text: Modern Algebra by Dr.S.Arumugam, Scitech Publications.

Unit 1: Vector Spaces-Definition and examples-Subspaces-Linear transformation-Span of a set.

(Chapter 5: Section 5.1 to 5.4)

Unit 2: Linear independence-Basis and Dimension-Theorems.

(Chapter 5: Section 5.5 and 5.6)

Unit 3: Rank and Nullity-Matrix of a linear transformation.

(Chapter 5: Section 5.7 and 5.8)

Unit 4: Characteristic equation of a matrix-Cayley Hamilton Theorem-Eigen Values and eigen vectors-related problems.

(Chapter 7: Section 7.7 and 7.8)

Unit 5: Inner product spaces-Gram Schmidt Orthogonalisation process-Orthogonal Complements.

(Chapter 6(full))

Major Paper 8: Real Analysis (105 Hrs)

Text: Modern Analysis by Dr.S.Arumugam, Scitech Publications.

Unit 1: Countable sets-Uncountable sets-Metric spaces-Bounded sets-Open ball-Open sets-Subspace.

(Chapter 1: Section 1.2, 1.3 and Chapter 2: Section 2.1 to 2.5)

Unit 2: Interior of a set-Closed sets- Closure-Limit points-Dense sets-Complete metric space-Cantor's intersection theorem-Baire's Category Theorem.

(Chapter 2: Section 2.6 to 2.10 and Chapter 3(full))

Unit 3: Continuity-Homomorphism-Uniform Continuity-Discontinuous functions on \mathbf{R} .

(Chapter 4(full))

Unit 4: Connectedness-Connected subsets of \mathbf{R} -Connectedness and Continuity-Contraction Mapping Theorem.

(Chapter 5 (full) and Chapter 8 upto theorem 8.2)

Unit 5: Compactness-Compact metric spaces-Compact subsets of \mathbf{R} -Heine Borel Theorem-Equivalent Characterizations for compactness-Compactness and Continuity. (Chapter 6(full))

Semester V

Major Paper 9: Elective I (Only one of the following three papers) (90 Hrs)

1.1 Astronomy

Text: Astronomy by S.Kumaravelu and Susheela Kumaravelu (2005 Edition)

Unit 1: The four formulas of spherical triangle-Celestial sphere-Diurnal motion-Time for rising of stars-Diagram of celestial sphere.

(Chapter 1: Articles 21 to 24 and Chapter 2: Articles 39 to 86)

Unit 2: The Earth-The zones of Earth-Terrestrial Latitudes and Longitudes-Radius of Earth-Rotation of Earth-Dip of Horizon-Twilight.

(Chapter 3: Articles 87 to 116)

Unit 3: Refraction-Effects of refraction-Cassini's Formula-Simple Problems.

(Chapter 4: Articles 117 to 134)

Unit 4: Geocentric Parallax-Effects of geocentric Parallax-Horizontal Parallax-Equatorial horizontal Parallax-Simple Problem.

(Chapter 5: Articles 135 to 145)

Unit 5: Kepler's Law of Motion-Mean Anomaly-Geocentric and Helio Geocentric latitude and longitudes-Simple Problems.

(Chapter 6: Articles 146 to 165)

1.2 Combinatorial Mathematics

Text: A first course in Combinatorial Mathematics by Ian Anderson.

Unit 1: Selections and Binomial Coefficients-Permutations-Ordered selections-Unordered Selections.

(Chapter 2: Sections 2.1, 2.2, 2.3 and 2.5)

Unit 2: Pairing Problems-Pairing within a set-Pairing between sets-An Optimal Assignment Problem.

(Chapter 3: Section 3.1, 3.2 and 3.3)

Unit 3: Recurrence-Fibonacci type relations-Using generating functions-Miscellaneous Methods.

(Chapter 4: Section 4.2, 4.3 and 4.4)

Unit 4: The inclusion-Exclusion Principle-The Principle-Rook Polynomials.

(Chapter 5: Section 5.1 and 5.2)

Unit 5: Block designs and error correcting codes-Block Designs-Square block designs.

(Chapter 6: Section 6.1 and 6.2)

1.3 Discrete Mathematics

Text: Discrete Mathematical Structures with Applications to Computer Science by J.P.Tremblay, R.Manohar TMH edition.

Unit 1: Logic-Statements and notations-Connectives-Tautologies.

(Chapter 1: Sections 1.1, 1.2(except 1.2.5))

Unit 2: Normal forms-The theory of inference for the statement calculus.

(Chapter 1: Sections 1.3 and 1.4)

Unit 3: The predicate-Theory of Inference for the Predicate Calculus.

(Chapter 1: Sections 1.5 and 1.6)

Unit 4: Lattices as Partially Ordered sets.

(Chapter 4: Section 4.1)

Unit 5: Boolean Algebra- Boolean Functions-Representation and minimization of Boolean functions.

(Chapter 4: Section 4.2, 4.3 and 4.4)

Semester V

Major Paper 10: Elective II (Only one of the following three papers)

2.1 Programming in C(Theory+ Practical)(90 Hrs)

Text: Programming in ANCI C by E. Balagurusamy.

Unit 1: Constants-Variables, Data types-Operations and Expressions-Managing Input and Output Operations.

(Chapters 2, 3 and 4)

Unit 2: Decision Making and Branching-Decision Making and Looping.

(Chapters 5 and 4)

Unit 3: Arrays-Handling of Character Strings.

(Chapters 7 and 8)

Unit 4: User Defined functions-Structures and Unions.

(Chapters 9 and 10)

Unit 5: Pointers-File Management in C.

(Chapters 11 and 12)

2.2 Coding Theory (90 Hrs)

Text: Coding Theory , the essentials-(marcal Dekkar, Inc.Madtrixm Avenue, Newyork.

(Chapters 1 to 4 except sections 3.8 and 3.9)

Unit 1: Basic Assumptions-Correcting and detecting error batterns-Information rate-effect of error correction and detection-finding the most likely code word-transmitted.

Unit 2: Linear Codes-Two important subspaces-Independence-Basic, dimension, Matrices-Bases for C and C^+ generating matrices on coding.

Unit 3: Parity Check matrices-Equivalent Codes-Distance of a linear code-Linear Codes-Cosets-IMLD for linear codes- Reliability of IMLD for linear codes.

Unit 4: Some bounds for codes-Perfect Codes-Hamming Codes-Extended Codes-The extended Golay code-Decoding the extened Golay code-Golay code..

Unit 5: Polynomials and Words-Introduction to cyclic codes-Polynomial encoding and decoding-Finding cyclic codes-Dual Cyclic Codes.

2.3 Fuzzy Sets and Logic

Text: Fuzzy Mathematical Concept by S.Nanda and n.R.Das, Narosa Publications

Unit 1: Fuzzy relations and Fuzzy Mapping.

(Chapter 1(full))

Unit 2: Fuzzy Relations and Fuzzy Logic.

(Chapter 2(full))

Unit 3: Fuzzy Groups and Fuzzy Rings.

(Chapter 3(full))

Unit 4: Fuzzy Fields and Fuzzy linear Space.

(Chapter 4(full))

Unit 5: Fuzzy Metric Space.

(Chapter 8(full))

Semester VI

Major Paper 11: Complex Analysis (90 Hrs)

Text: Complex Analysis by Dr.S.Arumugam and Others, Scitech Publications.

Unit 1: Complex numbers- n^{th} root of a Complex number-Circles and Straight Lines-Region in the Complex plane-Extended Complex plane.

(Chapter 1: Sections 1.1 to 1.9)

Unit 2: Functions of Complex variables-Limits-Differentiability-C.R Equations-Analytic Functions-Harmonic Functions.

(Chapter 2: Sections 2.1 to 2.8)

Unit 3: Elementary transformations-Cross Ratio-Fixed points of bilinear transformations-Some special bilinear transformations.

(Chapter 3: Sections 3.1 to 3.5)

Unit 4: Complex Integration-Definite Integral-Cauchy's Theorem-Cauchy's Integral Formula-Higher Derivatives-Taylor's Series.

(Chapter 6: Sections 6.1 to 6.4 and Chapter 7: Section 7.1)

Unit 5: Laurent Series-Singular Points-Residues-Cauchy's Residue Theorem-

Evaluation of Definite Integrals-Type 1- $\int_0^{2\pi} f(\cos\theta, \sin\theta) d\theta$ only.

(Chapter 7: Sections 7.2, 7.4 and Chapter 8: Sections 8.1 to 8.3)

Major Paper 12: Linear Programming (90 Hrs)

Text: Linear Programming by Dr.S.Arumugam and Others, New Gamma Publishing House.

Unit 1: Formulation of L.P.P-Mathematical formulation of a L.P.P-Canonical form-Solution of a L.P.P-Graphical Solution-Simplex Method.

(Chapter 3: Section 3.1 to 3.5)

Unit 2: Big M-Method-Two Phase Method-Application of Simplex Method-Duality in L.P.P-Primal dual Theorems-Dual Simplex Methods.

(Chapter 3: Section 3.6 to 3.10)

Unit 3: Transportation problem-Mathematical formulation-Solution of a transportation problem- North West Corner Rule-Row minima Method-Column minima Method-Matrix minima(Least Cost method)-Vogel's Approximation Method-Optimality Test.

(Chapter 4: Section 4.1 Only)

Unit 4: Assignment Problem-Mathematical formulation-Solution to Assignment Problem.

(Chapter 5: Section 5.1 and 5.2)

Unit 5: Sequencing-Processing n Jobs in 2 machines- Processing n Jobs in m machines- Processing 2 Jobs in m machines.

(Chapter 6: Section 6.1 to 6.3)

Major Paper 13: Mechanics (90 Hrs)

Text:

1. Statics by M.K.Venkataraman, Agasthiar Publications.
2. Dynamics by M.K.Venkataraman, Agasthiar Publications.

Unit 1: Forces acting at a point-Parallel forces and Moments.

(Text 1: Chapter 1: Articles 1 to 16 and Chapter 2: Articles 1 to 14)

Unit 2: Equilibrium of three forces acting on a rigid body-Frictions.

(Text 1: Chapter 5: Articles 1 to 8 and Chapter 7: Articles 1 to 14)

Unit 3: Projectiles.

(Text 2: Chapter 6: Sections 6.1 to 6.17)

Unit 4: Simple Harmonic motion-Simple Pendulum-Seconds Pendulum.

(Text 2: Chapter 10: Sections 10.1 to 10.15)

Unit 5: Motion under the action of central forces-Differential equation of central orbits-Picdal equation-Velocities in central orbit-Two fold problems in central orbits-Law of the inverse square.

(Text 2: Chapter 11: Sections 11.1 to 11.14)

Major Paper 14: Graph Theory (90 Hrs)

Text: Invitation to Graph Theory by S.Arumugam and S.Ramachandran

Unit 1: Definition and examples of Graphs-Degrees-Subgraphs-Isomorphism-Independent sets and Coverings-Intersection graphs and Line graphs-Matrices-Operation on Graphs.

(Chapter 2(full))

Unit 2: Degree sequences-Graphic sequences-Walks-Trails and Paths-Connectedness and Components-Connectivity.

(Chapter 3 and 4)

Unit 3: Eulerian Graphs-Hamiltonian Graphs-Characterisation of trees-Centre of a tree.

(Chapter 5 and 6)

Unit 4: Definition and properties of planar graphs- Characterisation of planar graphs-Chromatic number and Chromatic Index.

(Chapter 8: Sections 8.1, 8.2 and Chapter 9: Section 9.1)

Unit 5: Five Colour theorem and Four Colour theorem-Chromatic polynomials-Definition and basic properties of digraphs-Paths and Connectedness in digraphs.

(Chapter 9: Sections 9.2, 9.3, 9.4 and Chapter 10: Sections 10.1, 10.2)

Semester VI

Major Paper 15: Elective III (Only one of the following three papers)

3.1 Number Theory (90 Hrs)

Text: Number Theory by David M. Burton, TMH Edition.

Unit 1: Mathematical Induction-The Binomial Theorem-Early Number Theory.

(Chapter 1: Sections 1.1, 1.2 and Chapter 2: Section 2.1)

Unit 2: The Division Algorithm-The G.C.D-The Euclidean Algorithm-The Diophantic Equation $ax+by=c$.

(Chapter 2: Sections 2.2 to 2.5)

Unit 3: The Fundamental Theorem of Arithmetic-The Sieve of Eratosthenes-The Goldbach Conjecture.

(Chapter 4: Sections 4.2 to 4.4)

Unit 4: Basic properties of Congruence-Divisibility tests-Linear Congruence and the Chinese Remainder Theorem.

(Chapter 4: Sections 4.2 to 4.4)

Unit 5: Fermat's Theorem-Wilson's Theorem.

(Chapter 5: Sections 5.2, 5.3)

3.2 Operations Research (90 Hrs)

Text: Operations Research by P.R.Vital and V.Malini, Margham Publications.

Unit 1: Queuing Theory-Poisson Process Model I ($M|M|1;\infty|FIFO$)-Generalisation Model, Model II($M|M|1;N|FIFO$)-Model III($M|M|C;\infty|FIFO$)-Problems.

(Chapter 13: Pages 13.1 to 13.73)

Unit 2: Network Analysis-CPM-Determination of Critical path and Project Duration-PERT-Time estimates-Variance for activities.

(Chapter 14: Pages 14.1 to 14.68)

Unit 3: Game Theory-Pure and Mixed strategies-Saddle point-Dominance Property-Graphical method-Method of solving $2 \times n$ game-Method of solving $n \times 2$ game-Application of L.P.P in Graph theory.

(Chapter 15: Pages 15.1 to 15.52)

Unit 4: Replacement Problem-Individual replacement-Group replacement-Model I Replacement of an item whose maintenance cost increases with time and money value is not changed-Model II-Money value changes with time-Model III- Replacement of items due to sudden failure-Staff replacement.

(Chapter 16: Pages 16.1 to 16.41)

Unit 5: Inventory Control-VariouS Costs-Deterministic Model-Probabilistic or Stochastic Model I-No Shortage-Model II with Shortage-Newspaper boy problem-Price Break Model-ABC Analysis.

(Chapter 17: Pages 17.1 to 17.75)

3.3 Mathematical Programming with JAVA (Theory +Practical) (90 Hrs)

Text: JAVA 2 Programming by C.Xavier (Scitech Publications)

Unit 1: Introduction to JAVA-Histry-Overview_JAVA Applicatgion programmes-JAVA Applets-Commands-Line Arguments-Data Types-Variables-Comments.

Unit 2: Objects and Classes-Defining a Class-Constructors-Multiple Constructors-Wrapper Classes-Conversion of data types-Command live and Keyboard input-Attributes-Overriding-Object Composition with a simple example.

Unit 3: “IF” structure-nested IF structure-Break and labeled break-Switch structures-While Loop-Do Loop-For loop-Natural sum and Partial sum of serties using loops-Divergent series-Verification using loops-nested loop.

Unit 4: Arrays-Vectors-Stacks-Bitsets-Hash table-Random number generation-Determinant of Matrix-Interpolation.

Unit 5: Differentiation –Integration using trapezoidal rule-Simpson’s $\frac{1}{3}$ rule-
Numerical solution to differential equations-Euler’s method-Runge Kutta method-
JAVA programmes for all the above mentioned topics.

Programming IN C-List of Practicals

1. Write a program to convert the temperature from Fahrenheit to Celcius.
2. Write a program to test whether a given year is leap or not.
3. Write a program that will read the value of x and evaluate the following function

$$Y = \begin{cases} 1 & \text{if } x > 0 \\ 0 & \text{if } x = 0 \\ -1 & \text{if } x < 0 \end{cases} \text{ using nested 'IF' structures.}$$

4. Write a program to read two integers m and n and print the prime numbers in between them.
5. Write a program to evaluate the series $e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$
6. Write a program to arrange the given set of numbers in ascending order.
7. Write a program to read two matrices and to find the product of the matrix.
8. Write a program to check whether a given string is a palindrome or not.
9. Write a program to find the largest numbers and its location in the given set of numbers using pointers.
10. Write a program to read the content of a text file and copy it into another file.

Mathematical Programming using JAVA (List of Practicals)

1. Write a program find the surface area and volume of a sphere.
2. Write a program to print the first 15 Fibonacci numbers.
3. Write a program to find the nature and roots of a quadratic equation.
4. Write a program to evaluate the series $\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$
5. Write a program to evaluate the series $\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \dots$
6. Write a program to for finding the determinant of a matrix.
7. Find $f(3)$ for the following function using Lagrange's Interpolation method.

x :	0	1	2	5
f(x) :	2	3	12	147
8. Write a program to find the solution of a differential equation using Taylor's Series.
9. Write a program to evaluate the integral $\int_a^b e^{\tan x} dx$ using Trapezoidal rule.
10. Write a program to solve a differential equation using Runge-Kutta second order method.

Allied Statistics
(For Mathematics Students)

Statistics I

Text: Statistics, Dr.S.Arumugam and Others.

Unit 1: Moments, Skewness and Kurtosis, Curve Fitting-Method of least Squares-Fitting Lines-Parabolic, Exponential and Logarithmic Curves.

Unit 2: Correlation and Regression-Scatter Diagram-Karl Pearson's Coefficient of Correlation-Properties-Lines of Regression, Regression, Regression Coefficient and Properties-Rank Correlation.

Unit 3: Association of Attributes, Consistency of Data-Criteria for Independence-Yule's Coefficient of Association.

Unit 4: Discrete Probability Distributions:

Geometric, Binomial and Poisson Distributions-Their Moments, Generating function, Characteristic function, Properties and Simple Application.

Unit 5: Continuous Probability Distributions:

Beta 1 and Beta 2 and Gamma Distributions-Normal Distribution-Standard Normal Distribution-their Properties-Simple Problems-Importance of Normal Distribution.

Statistics II

Text: Statistics, Dr.S.Arumugam and Others.

Unit 1: Characteristics of index numbers-Laspeyer's and Paasche's-Bowley's-Marshall and Edge-worth's index numbers-Tests-Unit test, Commodity reversal test, Time reversal test, Circular Test.

Unit 2: Statistical Quality Control-Definition, Advantages, Process Control-Control Chart, Mean Chart, Range Chart, P-Chart, Product Control-Sampling Inspection Plans.

Unit 3: Testing of Hypothesis-Null Hypothesis and Alternate Hypothesis-Type I and Type II errors-Critical Region, Level of Significance-Test of significance for large samples-Testing a single Proportion-Difference of Proportions-Testing a single mean-Difference of Means.

Unit 4: Tests based on t-Distribution-Single Mean-Difference of Means-Tests based on F-Distribution-Variance Ratio Test-Test Based on Chi-Square Distribution-Independence-Goodness of fit.

Unit 5: Analysis of Variance-One way and two way classified data-Basis of experimental design-Simple Problems.

Allied (Computer Science I)

(For Mathematics Students)

Colleges not opting Physics /Chemistry as Allied Subjects.

Introduction to Computer System

Text Book: Fundamentals of Information Technology, Alexis Leon and Mathews Leon-Leon Tech world.

Unit 1: Introduction to computers-Classification of digital computer system-Anatomy of digital computer-Computer architecture-Number system-Memory Units-Storage devices-Input devices-Output devices, Basic Windows Commands: Uses of Microsoft-General Commands.

Unit 2: Computer software: Introduction to Computer software-Operating systems-Programming languages-General software features and trends, M.S word: Creating, Saving, Editing and Printing a document.

Unit 3: Database Management Systems: Data Processing-Introduction to Database Management Systems-Database design, M.S Excel-Creating, Editing and Printing Worksheets.

Unit 4: Internet and Intranet: Internet and World Wide Web-Electronic Mail-Intranets, M.S Power Point: Creating Power point Presentation-Inserting Slides-Types of Views-Custom Animation-Inserting Clip Art, Pictures and Videos-Slide Show.

Unit 5: Application of Information Technology: Computers in Business and Industry, Computers in Home, Computers in Education and Training, Computers in entertainment, Science-Medicine and Engineering, M.S Access-Structure Creation-Editing Database-Creation of reports and labels-Insertion and deletion of records-Filtration.

M.S Office –List of Practicals

1. Text editing with different styles
2. Table creation and editing
3. Cut, Paste, find and replace usage
4. Mathematical symbols, suffix and super fix, equation creation and editing
5. Worksheet for Payroll
6. Worksheet for EB billing
7. Database Creation for library books
9. Database Creation for employee's details
10. Presentation for a seminar with dynamic provisions

Allied (Computer Science II)

(For Mathematics Students)

Programming in C

Text Book: Programming with ANSI and Turbo C-Ashok N. Kamthane, Pearson education.

Unit 1: C language-Elementary Programming: Declarations-Assignments and Variable-Integers Arithmetic Expressions-More data types-Relational and logical Operators-if and if-else Statements-Switch Statement-while and do-while statements.

Unit 2:For loop-escape sequences and control characters-conversion specifications -user defined functions-local & global variables-parameters-Boolean functions.

Unit 3: Arrays-strings and character arrays-break and continue-conditional expression-multidimensional arrays.

Unit 4: Strings and string functions-static and auto classes-strcpy, strlen, malloc, size of, strcmp. Structures: concepts-initialization-tag-pointers to structures-period and arrow operators.

Unit 5: Standard input and output-putchar, getchar-header files-getc, putc file input and output.

C Programming-List of Practicals

1. Write a program to convert the temperature from Fahrenheit to Celsius.
2. Write a program to test whether the given year is leap year or not.
3. Write a program to read two integers m and n and print the prime numbers in between them.
4. Write a program to evaluate the series $e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \dots$.
5. Write a program to arrange the given set of numbers in ascending order.
6. Write a program to read two matrices and to find the sum and product of the matrices.
7. Write a program to check whether a given string is Palindrome or not.
8. Write a program to read the content of a text file and copy it into another file.
9. Write a program to find the largest number and its location in the given set of numbers using pointers.
10. Write a program to find Factorial value, Fibonacci, GCD value-Recursion.

Note:

M.S.Office Practical and C Programming Practical must be clubbed together.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12.

**Allied Mathematics
(For Science Students)**

(Effective from the Academic year 2012 – 2013)

Paper 1: Algebra and Differential Equations (90 hours)

Text: Allied Mathematics, Dr.S.Arumugam and Others.

Unit 1: Theory of equations-Relation between roots and coefficients-symmetric function of the roots in terms of coefficients.

Unit 2: Transformation of equations-Approximate solutions to equations-Newton's method -Horner's method.

Unit 3: Matrices-Characteristic equation of a matrix-Eigen values and eigen vectors-Cayley Hamilton theorem and simple problems.

Unit 4: Differential equation of first order but of higher degree-Equations solvable for p , x , y .

Unit 5: Laplace transformation-Inverse Laplace transform-solving linear differential equations using Laplace transforms.

Paper 2: Vector Calculus (90 hours)

Text: 1. Vector Calculus, Dr.S.Arumugam & others.

2. Calculus (Volume II), T.K.Manicavachagom Pillay.

Unit 1: Vector differentiation-Gradient- Divergence and curl .

Unit 2: Methods of integration.

Unit 3: Evaluation of double and triple integrals.

Unit 4: Vector integration-Line, surface and volume integrals.

Unit 5: Green's, Stoke's and Divergence Theorems(statements only)-simple problems.

APPENDIX - AZ43

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12.

B.Sc. Degree in Mathematics with Computer Applications (CBCS)

(For those who joined the course from the Academic year 2012 – 2013)

1. COURSE OBJECTIVES:

The objectives of the B.Sc. Mathematics with Computer Applications course are:

- To enable the learners to acquire mathematical expertise required for a professional career.
- To make the students to attain the mathematical background and exposure to the recent developments in the computer field.
- To provide an academic potential and technical skills needed for the aspirants in the competitive job market.

2. ELIGIBILITY NORMS FOR ADMISSION:

Those who seek admission to B.Sc Mathematics with Computer Applications course must have passed the Higher Secondary Examination conducted by the Board of Higher Secondary Examination, Tamil Nadu with Mathematics as one of the subjects or a course of study recognized and approved by the syndicate of the Manonmaniam Sundaranar University.

3. TRANSITORY PROVISION:

Candidates admitted to this course of studies, which come into effect from June 2012, should complete the course within six years (before June 2018). Those who fail to complete the course in the afore-said stipulated time have to pass the equivalent papers to be decided by the prospective U.G.Chairman of Board of studies (Mathematics) by the Manonmaniam Sundaranar University.

4. Course structure for B.Sc (Mathematics) under CBCS

Semester I			
	Components	Hours/ week	Credits
Part I	Tamil/ Other languages	6	3
Part II	English	6	3
Part III	Major Paper 1: Calculus	5	5
	Major Paper 2: Algebra	5	5
	Allied I:Paper 1: Introduction to Computer System(Theory)	4	5
	M.S.Office Practical	2	
Part IV	Environmental Studies	2	2
	Total(6 Courses)	30	23
Total hours per semester: 450			
Semester II			
	Components	Hours/ week	Credits
Part I	Tamil/ Other language	6	3
Part II	English	6	3
Part III	Major Paper 3: Vector Calculus	5	5
	Major Paper 4: Differential Equations and Fourier Series	5	5
	Allied II: Programming in C(Theory)	4	
	Practical	2	5
Part IV	Value Based Education	2	2
	Total (6 Courses)	30	23
Total hours per semester : 450			

Semester III			
	Components	Hours/ week	Credits
Part I	Tamil/ Other languages	6	3
Part II	English	6	3
Part III	Major Paper 5: Sequences and Series & Trigonometry	6	5
	Allied III: Programming in C++(Theory)	4	5
	Practical	2	
Part IV	Skill based Subject: Application of Differential equations	4	4
	Non-Major Elective: Statistical Methods	2	2
	Total(6 Courses)	30	22
Total hours per semester: 450			
Semester IV			
	Components	Hours/ week	Credits
Part I	Tamil/ Other language	6	3
Part II	English	6	3
Part III	Major Paper 6: Abstract Algebra	5	5
	Allied IV: Data Structures (Theory)	6	5
Part IV	Skill based Subject: Computer Oriented Numerical Methods	4	4
	Non-Major Elective: Mathematical Models(O.R)	2	2
Part V	Extension Activities (NCC,NSS,YRC,YWF)	1	1
	Total(6 Courses)	30	23
Total hours per semester: 450			

Semester V			
	Components	Hours/Week	Credits
Part III	Major Paper 7: Linear Algebra	7	5
	Major Paper 8: Real Analysis	7	5
	2 Major Electives:		
	Major Paper 9		
	Elective: 1 (any one of the following)		
	1.1. Operations Research	6	5
	1.2. Combinatorial Mathematics		
	1.3. Discrete Mathematics		
	Major Paper 10:		
	Elective: 2 (any one of the following)		
	2.1. Introduction to Web Design	4+2	5
	(Theory + Practical)		
	2.2. DBMS with Oracle(Theory + Practical)		
Part IV	Skill Based Subject(Common)	4	4
	Total(5 courses)	30	24
Total hours per semester: 450			
Semester VI			
Part III	Major Paper 11: Complex Analysis	6	5
	Major Paper 12: Linear Programming	6	5
	Major Paper 13: Mechanics	6	5
	Major Paper 14: Graph Theory	6	5
	1 Major Elective:		
	Major Paper 15		
	Elective: 3 (any one of the following)		
	3.1. Mathematical Programming with	4+2	5
	JAVA(Theory+ Practical)		
	3.2. DTP and FLASH(Theory+ Practical)		
	Total(5 courses)	30	25
Total hours per semester: 450			

Total number of courses : 34

Total number of hours : 2700

Total number of credits : 140

Distribution of marks in theory between External and Internal Assessment is **75:25**

For all Practicals, Internal Assessment is as follows:

Test: 15 marks

Practical: 10 marks

Pass minimum of 40% for external and overall components.

Appropriate Major/Allied related, 'Allied Courses' and 'Skill Based Courses' may be chosen by the Major departments, taking into account the total work-load of the department.

5.QUESTION PATTERN:

Duration: 3 hours

Maximum Marks: 75

Part A: (10×1=10)

Objective type-Two questions from each unit.

Part B: (5×5=25)

One question from each unit with internal (either-or) choice.

Part C: (5×8=40)

One question from each unit with internal (either-or) choice.

Non Major Elective

Duration: 2 hours

Maximum Marks: 75

Part A: (20×2=40)

Short answer questions.

Four questions from each unit.

Part B: (5×7=35)

One question from each unit with internal (either-or) choice.

Semester III

Major Paper 5: Sequences, Series and Trigonometry (90 hrs)

Text:

1. Sequences and Series-S.Arumugam and Others.
2. Trigonometry-S.Narayanan and T.K.Manicavachagom Pillay,

Unit 1: Sequences-Bounded Sequences-Monotonic Sequences-Convergent Sequences-Divergent and Oscillating Sequences-The algebra of limits.

(Text 1: Chapter 3: Sections 3.1 to 3.6)

Unit 2: Behaviour of monotonic sequences- Some theorems on limits-Subsequences-Limit points-Cauchy sequences-Cauchy general principle of convergence of series.

(Text 1: Chapter 3: Sections 3.7 to 3.11)

Unit 3: Series-Infinite series-Comparison test-Kummer's Test-D'Alembert's ratio test-Raabe's test-Gauss's test-Root test-Cauchy's condensation test(without proof)

(Text 1: Chapter 4: Sections 4.1 to 4.4)

Unit 4: Alternating series-Leibnitz's test-Absolute Convergence-Multiplication of series-Abel's theorem-Merten's theorem.

(Text 1: Chapter 5: Sections 5.1, 5.2 and 5.5)

Unit 5: Hyperbolic functions-Logarithm of a complex number-Summation of a trigonometric series using $C+iS$ method-Gregory's series.

(Text-2 Chapter IV(full), Chapter V-Section 5, Chapter VI-Section 3)

Skill Based Elective Paper-I (60 Hrs)

Semester III

Application of Differential Equations

Text: Differential Equations and its Applications by -S.Narayanan and T.K.Manicavachagom Pillay,

Unit 1: Application of first order equations-Growth, Decay and Chemical reactions.

(Chapter III: Sections 1)

Unit 2: Flow of water from an orifice-Falling bodies and other rate problems.

(Chapter III: Sections 2 and Sections 3)

Unit 3: The Brachistochrone problem-Simple electric Circuits.

(Chapter III: Sections 4 and 6)

Unit 4: Dynamical problems with variable mass, Application to vibrations in mechanical system.

(Chapter III- Section 7 and Chapter IV-Section 70)

Unit 5: Newton's law of gravitation and motion of planets.

(Chapter IV-Section 8)

Semester III

Non Major Elective Paper I (30 Hrs)

Statistical Methods

Text: Statistics by DR.S.Arumugam

Unit 1: Correlation and Rank Correlation.

(Chapter 6: Section 6.1 and 6.2)

Unit 2: Regression.

(Chapter 6: Section 6.3)

Unit 3: Interpolation-Finite Differences..

(Chapter 7: Section 7.1)

Unit 4: Newton's Formula, Lagrange's Formula.

(Chapter 7: Section 7.2 and 7.3)

Unit 5: Theory of Attributes-Consistency of Data-Independence and Association of Data. (Chapter 8)

Semester IV

Major Paper 6: Abstract Algebra(75 Hrs)

Text: Modern Algebra by Dr.S.Arumugam, Scitech Publications.

Unit 1: Relations and Mappings-Relations-Equivalence relations-Functions.

(Chapter 2: Section 2.1, 2.2 and 2.4)

Unit 2: Groups-Permutation groups-Cyclic groups-Order of an element-Cosets and Lagrange's theorem.

(Chapter 3: Section 3.4, 3.6, 3.7 and 3.8)

Unit 3: Normal subgroups and Quotient groups-Isomorphism-Homomorphism.

(Chapter 3: Section 3.9, 3.10 and 3.11)

Unit 4: Rings-Elementary properties of rings-Isomorphism-Types of rings-Characteristics of a ring-Subring.

(Chapter 4: Section 4.1 to 4.6)

Unit 5: Ideals-Quotient rings-Maximal and Prime ideals-Homomorphism of rings.

(Chapter 4: Section 4.7 to 4.10)

Skill Based Elective (60 Hrs)

Semester IV

Computer Oriented Numerical Methods (CONM)

Unit – I : The solution of numerical algebraic and transcendental equations:

Bisection method – Method of Successive Approximations or the iteration method – Regula Falsi method – Newton Raphson method.

Unit – II : Simultaneous Linear Algebraic Equations: Gauss Elimination method - Gauss Jordan Elimination method – Gauss Jacobi method – Gauss Seidel method.

Unit – III: Interpolation: Gregory Newton Forward and Backward Interpolation formula.

Interpolation with Unequal Intervals: Divided differences – Lagrange's Interpolation formula –Inverse Interpolation.

Unit – IV: Numerical Differentiation and Integration: Newton's Forward and Backward Difference formulae to compute the derivatives – Trapezoidal rule – Simpson's 1/3 rule.

Unit – V: Numerical Solution of Ordinary Differential Equations: Taylor series method – Euler's method – Runge-Kutta methods – Milne's predictor-corrector method.

Text Book:

“Numerical Methods in Science and engineering”, Dr. M.K.Venkataraman , Fifth Edition, The National Publishing Company.

Reference Books:

1. “Computer Oriented Numerical Methods”, V.Rajaraman, Third Edition, PHI.
2. “Numerical Methods”, E. Balagurusamy –TMH
3. ”Numerical methods”, S.Kalavathy,Vijay Nicole Pvt Ltd.

Semester IV

Non Major Elective Paper I (30 Hrs)

Mathematical Models (O.R)

Text: Linear Programming by Dr.S.Arumugam and Others.

Unit 1: L.P.P-Mathematical formulation of a L.P.P.

(Chapter 3: Section 3.1 and 3.2)

Unit 2: Graphical solution of a L.P.P.

(Chapter 3: Section 3.4)

Unit 3: Transportation problem-initial- Basic feasible solutions only(North West Corner Rule-Row minima –Column minima-Matrix minima(Least Cost method).

(Chapter 4: Section 4.1, step I)

Unit 4: Sequencing-Processing n Jobs in 2 machines-Graphical method.

(Chapter 6: Section 6.1)

Unit 5: Processing n Jobs in m machines.

(Chapter 6: Section 6.2)

Semester V

Major Paper 7: Linear Algebra (105 Hrs)

Text: Modern Algebra by Dr.S.Arumugam, Scitech Publications.

Unit 1: Vector Spaces-Definition and examples-Subspaces-Linear transformation-Span of a set.

(Chapter 5: Section 5.1 to 5.4)

Unit 2: Linear independence-Basis and Dimension-Theorems.

(Chapter 5: Section 5.5 and 5.6)

Unit 3: Rank and Nullity-Matrix of a linear transformation.

(Chapter 5: Section 5.7 and 5.8)

Unit 4: Characteristic equation of a matrix-Cayley Hamilton Theorem-Eigen Values and eigen vectors-related problems.

(Chapter 7: Section 7.7 and 7.8)

Unit 5: Inner product spaces-Gram Schmidt Orthogonalisation process-Orthogonal Complements.

(Chapter 6(full))

Major Paper 8: Real Analysis (105 Hrs)

Text: Modern Analysis by Dr.S.Arumugam, Scitech Publications.

Unit 1: Countable sets-Uncountable sets-Metric spaces-Bounded sets-Open ball-Open sets-Subspace.

(Chapter 1: Section 1.2, 1.3 and Chapter 2: Section 2.1 to 2.5)

Unit 2: Interior of a set-Closed sets- Closure-Limit points-Dense sets-Complete metric space-Cantor's intersection theorem-Baire's Category Theorem.

(Chapter 2: Section 2.6 to 2.10 and Chapter 3(full))

Unit 3: Continuity-Homomorphism-Uniform Continuity-Discontinuous functions on \mathbf{R} .

(Chapter 4(full))

Unit 4: Connectedness-Connected subsets of \mathbf{R} -Connectedness and Continuity-Contraction Mapping Theorem.

(Chapter 5 (full) and Chapter 8 upto theorem 8.2)

Unit 5: Compactness-Compact metric spaces-Compact subsets of \mathbf{R} -Heine Borel Theorem-Equivalent Characterizations for compactness-Compactness and Continuity.

(Chapter 6(full))

Semester V

Major Paper 9: Elective 1 (Only one of the following three papers) (90 Hrs)

1.1 Operations Research (90 Hrs)

Text: Operations Research by P.R.Vital and V.Malini, Margham Publications.

Unit 1: Queuing Theory-Poisson Process Model I ($M|M|1;\infty|FIFO$)-Generalisation Model, Model II($M|M|1;N|FIFO$)-Model III($M|M|C;\infty|FIFO$)-Problems.

(Chapter 13: Pages 13.1 to 13.73)

Unit 2: Network Analysis-CPM-Determination of Critical path and Project Duration-PERT-Time estimates-Variance for activities.

(Chapter 14: Pages 14.1 to 14.68)

Unit 3: Game Theory-Pure and Mixed strategies-Saddle point-Dominance Property-Graphical method-Method of solving $2 \times n$ game-Method of solving $n \times 2$ game-Application of L.P.P in Graph theory.

(Chapter 15: Pages 15.1 to 15.52)

Unit 4: Replacement Problem-Individual replacement-Group replacement-Model I Replacement of an item whose maintenance cost increases with time and money value is not changed-Model II-Money value changes with time-Model III- Replacement of items due to sudden failure-Staff replacement.

(Chapter 16: Pages 16.1 to 16.41)

Unit 5: Inventory Control-Variou Costs-Deterministic Model-Probabilistic or Stochastic Model I-No Shortage-Model II with Shortage-Newspaper boy problem-Price Break Model-ABC Analysis.

(Chapter 17: Pages 17.1 to 17.75)

1.2 Combinatorial Mathematics

Text: A first course in Combinatorial Mathematics by Ian Anderson.

Unit 1: Selections and Binomial Coefficients-Permutations-Ordered selections-Unordered Selections.

(Chapter 2: Sections 2.1, 2.2, 2.3 and 2.5)

Unit 2: Pairing Problems-Pairing within a set-Pairing between sets-An Optimal Assignment Problem.

(Chapter 3: Section 3.1, 3.2 and 3.3)

Unit 3: Recurrence-Fibonacci type relations-Using generating functions-Miscellaneous Methods.

(Chapter 4: Section 4.2, 4.3 and 4.4)

Unit 4: The inclusion-Exclusion Principle-The Principle-Rook Polynomials.

(Chapter 5: Section 5.1 and 5.2)

Unit 5: Block designs and error correcting codes-Block Designs-Square block designs.

(Chapter 6: Section 6.1 and 6.2)

1.3 Discrete Mathematics

Text: Discrete Mathematical Structures with Applications to Computer Science by J.P.Tremblay, R.Manohar TMH edition.

Unit 1: Logic-Statements and notations-Connectives-Tautologies.

(Chapter 1: Sections 1.1, 1.2(except 1.2.5))

Unit 2: Normal forms-The theory of inference for the statement calculus.

(Chapter 1: Sections 1.3 and 1.4)

Unit 3: The predicate-Theory of Inference for the Predicate Calculus.

(Chapter 1: Sections 1.5 and 1.6)

Unit 4: Lattices as Partially Ordered sets.

(Chapter 4: Section 4.1)

Unit 5: Boolean Algebra- Boolean Functions-Representation and minimization of Boolean functions.

(Chapter 4: Section 4.2, 4.3 and 4.4)

Semester V

Major Paper 10: Elective 2 (Only one of the following two papers) (90 Hrs)

2.1 Introduction to Web Design (60 Hours)

Unit I: Internet principles: **Introduction to Internet – protocol-IP address-Internet services –Email-WWW-Internet security-EDI and E-commerce**

Introduction to HTML: History-Tags-Images and pictures-List-Tables.

Unit II : *Frames and forms: Definition-HTML forms-Elements of forms.*

Elements of JavaScript: Data types-variables-operators-Conditional statements-Array, Date and String objects.

Unit III: *Objects and events: Document object model-The document object-Image object-Forms and Elements –Event Handling-Browser object –Submit event and data validation*

User Input processing: parseInt() Function-parseFloat() Function-Recursive function-Examples

Unit IV: *Server side script with JSP: Client –Server Responsibilities –JSP Architecture –JSP servers-tags-Request and Response object - Business processing with JSP*

JSP with JDBC: Introduction-Simple application

Unit V : *Java servlet: Protocol support-HTML support-Replacing CGI Scripts-Installing serve lets-Using Java web server-Servlet API- Life cycle-HTML to servlet communication*

Case studies: Online Railway reservation – Web enabled banking

Textbook:

1. WEB Technology and Design by C.Xavier, New Age International publishers, 2008

Reference

1. Jeff Frantzen and Sobotka,” Java Script” Tata McGraw Hill, 2005

Practical List

1. Write a HTML code to create an Ordered list
2. Write a HTML code to create an Unordered list
3. Write a HTML code to Display your class time table.
4. Write a HTML code to display any Five formulae with superscript and subscript.
5. Write a HTML code create a college application form.
6. Design a Web page to display the information about your university.
7. Design a simple web page to demonstrate how to include an image to that web page.
8. Write a program to display the details of the students

2.2 Database Management Systems with Oracle (60 hours)

Unit 1: Introduction: Database System Applications-Database Systems versus File Systems-View of Data-Data models –Database Languages –Database Users and Administrators – Transaction Management –Database System Structure .

Entity-Relationship Model Basic Concepts – Constraints –Keys Design Issues- Entity –Relationship Diagram –Weak Entity Sets-Extended E-R Features – Design of an E-R Database Schema .

Unit 2: SQL Basic Structure – Set Operations- Aggregate Functions- -Null Values- Nested Subqueries – Aggregate Functions- Null Values – Nested Subqueries – Views Complex Queries – Modification of the Database – Joined Relations – Data-Definition Language –Embedded SQL –Dynamic SQL.

Unit 3: Integrity and Security: Domain Constraint – Referential Integrity – Assertions –Triggers-Security and Authorization in SQL –Encryption and Authentication.

Relational –Database Design: First Normal Form-Pitfalls in Relational-Database Design –Functional Dependencies-Decomposition – Desirable Properties of Decomposition – Boyce-Codd Normal Form – Third Normal Form-Fourth Normal Form – Normal Forms.

Unit 4: Schema Objects Data Integrity – Creating and Maintaining Tables – Indexes –Sequences – Views –Users Privileges and Roles –Synonyms.

Unit 5: PL/SQL: PL/SQL –Triggers – Stored Procedures and Functions – Package – Cursors -Transaction

Text Books:

1) Database System Concepts – Silberschatz Korth Sudarshan,

International (4th Edition) Mc Graw Hill Higher Education 2002.

2) Jose A.Ramalho – Learn ORACLE 8i BPB Publications 2000

Reference Books:

1. “Oracle 9i The complete reference“,Kevin Loney and George Koch, Tata McGraw Hill, 2002.

2. “Database Management Systems “ ,Ramakrishnan and Gehrke, , Mc Graw Hill , Third Edition , 2003.

3. “ Oracle 9i PL/SQL Programming “Scott Urman , Oracle Press , Tata Mc Graw Hill , 2002.

DBMS With Oracle- PRACTICAL LIST

1. Creating, modifying and dropping Tables.
2. Creating tables with referential and check constraints.
3. Inserting, modifying, deleting rows.
4. Dropping, disabling /enabling constraints
5. Retrieving rows with operators in where Clause.
6. Retrieving rows with Character functions.
7. Retrieving rows with Sub Queries.
8. PL/SQL Programs for EB bill.
9. PL/SQL programs with control structures.
10. Creating and Calling Procedures.
11. Creating and Calling Functions.

Semester VI

Major Paper 11: Complex Analysis (90 Hrs)

Text: Complex Analysis by Dr.S.Arumugam and Others, Scitech Publications.

Unit 1: Complex numbers- n^{th} root of a Complex number-Circles and Straight Lines-Region in the Complex plane-Extended Complex plane.

(Chapter 1: Sections 1.1 to 1.9)

Unit 2: Functions of Complex variables-Limits-Differentiability-C.R Equations-Analytic Functions-Harmonic Functions.

(Chapter 2: Sections 2.1 to 2.8)

Unit 3: Elementary transformations-Cross Ratio-Fixed points of bilinear transformations-Some special bilinear transformations.

(Chapter 3: Sections 3.1 to 3.5)

Unit 4: Complex Integration-Definite Integral-Cauchy's Theorem-Cauchy's Integral Formula-Higher Derivatives-Taylor's Series.

(Chapter 6: Sections 6.1 to 6.4 and Chapter 7: Section 7.1)

Unit 5: Laurent Series-Singular Points-Residues-Cauchy's Residue Theorem-

Evaluation of Definite Integrals-Type 1- $\int_0^{2\pi} f(\cos\theta, \sin\theta) d\theta$ only.

(Chapter 7: Sections 7.2, 7.4 and Chapter 8: Sections 8.1 to 8.3)

Major Paper 12: Linear Programming (90 Hrs)

Text: Linear Programming by Dr.S.Arumugam and Others, New Gamma Publishing House.

Unit 1: Formulation of L.P.P-Mathematical formulation of a L.P.P-Canonical form-Solution of a L.P.P-Graphical Solution-Simplex Method.

(Chapter 3: Section 3.1 to 3.5)

Unit 2: Big M-Method-Two Phase Method-Application of Simplex Method-Duality in L.P.P-Primal dual Theorems-Dual Simplex Methods.

(Chapter 3: Section 3.6 to 3.10)

Unit 3: Transportation problem-Mathematical formulation-Solution of a transportation problem- North West Corner Rule-Row minima Method-Column minima Method-Matrix minima(Least Cost method)-Vogel's Approximation Method-Optimality Test.

(Chapter 4: Section 4.1 Only)

Unit 4: Assignment Problem-Mathematical formulation-Solution to Assignment Problem.

(Chapter 5: Section 5.1 and 5.2)

Unit 5: Sequencing-Processing n Jobs in 2 machines- Processing n Jobs in m machines- Processing 2 Jobs in m machines.

(Chapter 6: Section 6.1 to 6.3)

Major Paper 13: Mechanics (90 Hrs)

Text:

1. Statics by M.K.Venkataraman, Agasthiar Publications.
2. Dynamics by M.K.Venkataraman, Agasthiar Publications.

Unit 1: Forces acting at a point-Parallel forces and Moments.

(Text 1: Chapter 1: Articles 1 to 16 and Chapter 2: Articles 1 to 14)

Unit 2: Equilibrium of three forces acting on a rigid body-Frictions.

(Text 1: Chapter 5: Articles 1 to 8 and Chapter 7: Articles 1 to 14)

Unit 3: Projectiles.

(Text 2: Chapter 6: Sections 6.1 to 6.17)

Unit 4: Simple Harmonic motion-Simple Pendulum-Seconds Pendulum.

(Text 2: Chapter 10: Sections 10.1 to 10.15)

Unit 5: Motion under the action of central forces-Differential equation of central orbits-Picdal equation-Velocities in central orbit-Two fold problems in central orbits-Law of the inverse square.

(Text 2: Chapter 11: Sections 11.1 to 11.14)

Major Paper 14: Graph Theory (90 Hrs)

Text: Invitation to Graph Theory by S.Arumugam and S.Ramachandran

Unit 1: Definition and examples of Graphs-Degrees-Subgraphs-Isomorphism-Independent sets and Coverings-Intersection graphs and Line graphs-Matrices-Operation on Graphs.

(Chapter 2(full))

Unit 2: Degree sequences-Graphic sequences-Walks-Trails and Paths-Connectedness and Components-Connectivity.

(Chapter 3 and 4)

Unit 3: Eulerian Graphs-Hamiltonian Graphs-Characterisation of trees-Centre of a tree.

(Chapter 5 and 6)

Unit 4: Definition and properties of planar graphs- Characterisation of planar graphs-Chromatic number and Chromatic Index.

(Chapter 8: Sections 8.1, 8.2 and Chapter 9: Section 9.1)

Unit 5: Five Colour theorem and Four Colour theorem-Chromatic polynomials- Definition and basic properties of digraphs-Paths and Connectedness in digraphs.

(Chapter 9: Sections 9.2, 9.3, 9.4 and Chapter 10: Sections 10.1, 10.2)

Elective 3 (Any one of the following)

3.1 Mathematical Programming with JAVA (Theory +Practical) (90 Hrs)

Unit 1: Introduction to JAVA-History-Overview_JAVA Application programmes-JAVA Applets-Commands-Line Arguments-Data Types-Variables-Comments.

Unit 2: Objects and Classes-Defining a Class-Constructors-Multiple Constructors-Wrapper Classes-Conversion of data types-Command line and Keyboard input-Attributes-Overriding-Object Composition with a simple example.

Unit 3: “IF” structure-nested IF structure-Break and labeled break-Switch structures-While Loop-Do Loop-For loop-Natural sum and Partial sum of series using loops-Divergent series-Verification using loops-nested loop.

Unit 4: Arrays-Vectors-Stacks-Bitsets-Hash table-Random number generation-Determinant of Matrix-Interpolation.

Unit 5: Differentiation –Integration using trapezoidal rule-Simpson’s $\frac{1}{3}$ rule-Numerical solution to differential equations-Euler’s method-Runge Kutta method-JAVA programmes for all the above mentioned topics.

Text: JAVA 2 Programming by C.Xavier (Scitech Publications)

Mathematical Programming using JAVA (List of Practicals)

1. Write a program find the surface area and volume of a sphere.
2. Write a program to print the first 15 Fibonacci numbers.
3. Write a program to find the nature and roots of a quadratic equation.
4. Write a program to evaluate the series $\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$
5. Write a program to evaluate the series $\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \dots$
6. Write a program to for finding the determinant of a matrix.
7. Find f(3) for the following function using Lagrange's Interpolation method.

x :	0	1	2	5
f(x) :	2	3	12	147

8. Write a program to find the solution of a differential equation using Taylor's Series.
9. Write a program to evaluate the integral $\int_a^b e^{\tan x} dx$ using Trapezoidal rule.
10. Write a program to solve a differential equation using Runge-Kutta second order method.

3.2: Desktop Publishing and Flash

Unit 1: Introduction, Windows-Introducing Windows-Working with files and folders-PageMaker-Getting Started with PageMaker-Editing Text-Formatting Text-Master pages-Working with Graphics and Objects-Managing and Printing a Publication.

Unit 2: Corel DRAW- Corel DRAW Bascis-Drawing and Selecting-Working with Text-Working with Images.

Unit 3: Page Layout and Background: Photoshop-Starting Photoshop-Working with Images-Making Selections-Painting, Drawing and Retouching Tools: Layers-Type-Filters-Printing Customization.

Unit 4: FLASH: Working with objects-Adding, Sound and Animation to the objects-Use of Buttons and Text in Flash 8-using Movie Explorer in Flash 8-Working with Graphics and Layers in Flash 8.

Unit 5 : Distributing Flash Movies-Using Twin and Actions-Advanced Animations-Drawing and Planning.

Text Book:

1. Comdex DTP Course Kit, Vikas Gupta, Dreamtech Press.
2. Flash 8, Dinesh Maidasani, Firewall Media.

Reference

1. Desktop Publishing, Dinesh Maidasani, Firewall Media.

Allied III (Semester III)

PROGRAMMING IN C++ (60 hours)

Unit I: Classes and Objects:

Introduction – classes in C++ - declaring objects – the public keyword – the private keyword – the protected keyword – defining member functions – data hiding or encapsulation – classes, objects and memory – static member variables and functions – array of objects – objects as function arguments – friend functions – local classes – member functions and non-member functions – overloading member functions.

Unit II: Constructors and destructors:

Introduction – constructors and destructors – characteristics of constructors and destructors – constructors with arguments – overloading constructors – constructors with default arguments – copy constructors – destructors – calling constructors and destructors – private constructors and destructors – dynamic initialization using constructors – dynamic operators and constructors – the main() as a constructor and destructor .

Unit III: Operator overloading and type conversion:

Introduction – the keyword operator – overloading unary operator – operator return type – overloading binary operators – overloading with friend function – type conversion – rules for overloading operators .

Inheritance:

Introduction – access specifiers and simple inheritance – single inheritance – multilevel inheritance – multiple inheritance – multipath inheritance.

Unit IV: Pointers and Arrays:

Introduction – pointer declaration – pointer to object – the this pointer – pointer to derived classes and base classes – pointer to members – Arrays - initialization of arrays using functions – binding in C++ - pointer to derived class objects.

Virtual Functions: Rules for Virtual Functions – Pure Virtual function – Abstract Classes

Unit V: Files:

File stream classes – steps of file operations – checking for errors – finding end of a file – file opening modes – file pointers and manipulators – manipulators with arguments – sequential read and write operations – binary and ASCII files – random access operation – Command Line Arguments.

Text Book:

Object-Oriented Programming with ANSI & Turbo C++ , 1/e, 2003, Ashok n. Kamthane ,Pearson Education.

Reference Books:

1. Programming with ANSI C++ , Bhushan Trivedi, Oxford University Press 2010
2. Object oriented programming C++ , E.Balagurusamy 4th Edition., Tata McGraw-Hill
3. Programming with C++ , D.Ravichandran 2nd Edition., Tata McGraw-Hill.

OBJECT ORIENTED PROGRAMMING USING C++ - PRACTICAL LIST

1. Write a program in C++ to perform Area calculation using Function overloading (Min three functions).
2. Write a program to find minimum of two numbers between two class objects using friend function.
3. Using class and objects, find the sum of two matrices using pointers.
4. Write a C ++ program to overload unary minus operator which changes sign of given vector (3 elements)
5. Write a C ++ program to overload Binary + operator which adds two complex numbers.
6. Write a C ++ program to overload Binary + operator to concatenate two strings.
7. Write a program using multiple inheritance to process students mark list.
8. Write a program using Multi level inheritance to process employee details
9. Write a program in C++ to prepare telephone bill using text file.
10. Write a program in C++ to process mark listing using binary file.

Allied IV (Semester IV) DATA STRUCTURES (90 hours)

Unit I : INTRODUCTION - Pseudocode-The Abstract Data Type-A Model for an Abstract DataType-Algorithms Efficiency

SEARCHING –Linear search, Binary search, List Searches-Hashed List Searches.

Unit II : LINKED LISTS - Linear List Concepts – Linked List Concepts-Linked List Algorithms-Processing a Linked List-complex Linked List Structures.

Unit III :STACKS AND QUEUES -Basic Stacks operations-Stack Linked List Implementation – Stack Applications-Queue operations-Queue Linked List Design.

Unit IV: TREES -Basic Tree Concepts-Binary Trees- Binary Tree Traversals-Expression Trees-General Trees-Binary Search Trees-Heap Definition-Heap Structure – Basic Heap Algorithms. –Heap Data Structures – Heap Algorithms

Unit V: GRAPHS -Terminology-Operations-Graph storage Structure-Graph Algorithms-Networks

SORTING-Quick sort –merge sort

Text Book

1.DATA STRUCTURES A Pseudocode Approach with C++, Richard F. Gilberg & Behrouz A. forouzan ,THOMSON BROOKS/COLE.

APPENDIX - AZ44

MANONMANIAM SUNDARANAR UNIVERSITY - TIRUNELVELI

DEGREE OF BACHELOR OF SCIENCE

B.Sc. PHYSICS

CBCS

CHOICE BASED CREDIT SYSTEM NORMS AND PATTERN AS
IMPLEMENTED IN ALL AFFILIATED COLLEGES FROM THE ACADEMIC
YEAR 2012-2013

Components of the B.Sc Physics (Major) Programme:

Total number of courses: 40 Theory: 33 Courses Practical: 7 Courses

Total number of hours: 180 hours

Total number of Credits: 140

Distribution of marks between External and Internal Assessment is

➤ For Theory 75 : 25

➤ For Practical 60 : 40

Pass minimum of 40% for external and overall components.

Major Practical hours may be adjusted as 2Hrs/3Hrs.

Internal Marks for Practical shall be allotted in the following manner

Experimental work :	20 marks
Record:	10 marks
Model test:	10 marks
Total:	40 marks

Internal Marks for Theory shall be allotted in the following manner

The average of the best two from three compulsory tests. Each test is of one hour duration.	20 marks
Assignment	05 marks
Total:	25 marks

Common course structure for B.Sc Degree course under CBCS

I Semester

	Components	Hours	Credits
Part I	Tamil (1 course)	1×6 =6	1×3=3
Part II	English (1 course)	1×6 =6	1×3=3
Part III	Core Subjects (2 Courses) 2 Theory 1 Practical	2T×4=8 1P×2=2	2T×4=8 -----
	Allied Subject I (1 Course)	1T×4=4 1P×2=2	1T×4=4 -----
Part IV	Environmental Studies (1Course)	1×2=2	1×2=2
	Total(6 Courses)	30	20

II Semester

	Components	Hours	Credits
Part I	Tamil (1 course)	1×6 =6	1×3=3
Part II	English (1 course)	1×6 =6	1×3=3
Part III	Core Subjects (2 Courses) 2 Theory 1 Practical	2T×4=8 1P×2=2	2T×4=8 1P×2=2
	Allied Subject I (1 Course)	1T×4=4 1P×2=2	1T×4=4 1P×2=2
Part IV	Value Based Education (1Course)	1×2=2	1×2=2
	Total(6 Courses)	30	24

III Semester

	Components	Hours	Credits
Part I	Tamil (1 course)	1×6 =6	1×3=3
Part II	English (1 course)	1×6 =6	1×3=3
Part III	Core Subjects(1 Course) 1 Theory 1 Practical	1T×4=4 1P×2=2	1T×4=8 -----
	Allied Subject II (1 Course)	1T×4=4 1P×2=2	1T×4=4 -----
Part IV	Skilled Based Subject(1Course)	1×4=4	1×4=4
	Non-Major Elective (1 Course)	1×2=2	1×2=2
	Total(6 Courses)	30	20

IV Semester

	Components	Hours	Credits
Part I	Tamil (1 course)	1×6 =6	1×3=3
Part II	English (1 course)	1×6 =6	1×3=3
Part III	Core Subjects(1 Course) 1 Theory 1 Practical	1T×4=4 1P×2=2	1T×4=4 1P×2=2
	Allied Subject II (1 Course)	1T×4=4 1P×2=2	1T×4=4 1P×2=2
Part IV	Skilled Based Subject(1Course)	1×4=4	1×4=4
	Non-Major Elective (1 Course)	1×2=2	1×2=2
Part V	Extension Activity (NCC,NSS,YRC,YWF)		1
	Total (6 Courses)	30	25

V Semester

	Components	Hours	Credits
Part III	Core Subjects (Courses)		
	2 Theory	$2T \times 4 = 8$	$2T \times 4 = 8$
	2 Major Elective	$2E \times 5 = 10$	$2E \times 5 = 10$
	3 Practical	$2P \times 3 = 6$ $1P \times 2 = 2$	----- -----
Part IV	Skilled Based Subject Common (1Course)	$1 \times 4 = 4$	$1 \times 4 = 4$
	Total(6 Courses)	30	22

VI Semester

	Components	Hours	Credits
Part III	Core Subjects(Courses)		
	3 Theory	$2T \times 6 = 12$ $1T \times 5 = 5$	$3T \times 4 = 12$
	1 Major Elective	$1E \times 5 = 5$	$1E \times 5 = 5$
	3 Practical	$2P \times 3 = 6$ $1P \times 2 = 2$	$3P \times 4 = 12$
	Total(7 Courses)	30	29

BSc Physics Syllabus Semester III,IV,V and VI
III Semester

Core Paper V Electricity and Magnetism

Skill Based Subject (any ONE)

1. Maintenance of electric equipment
2. Applied Physics- Numerical methods

Non Major Elective (any ONE)

1. Basic physics I
2. Energy physics

Practical II

IV Semester

Core Paper VI Object Oriented Programming with C++

Skill Based Subject (any ONE)

1. Maintenance of Electronic equipment **GSPH4A**
2. Physics for Competitive examinations

Non Major Elective (any ONE)

1. Basic Physics II
2. Descriptive Physics (No derivation)

Practical II

V Semester

Core Paper VII Atomic Physics

Core Paper VIII Basic Electronics

Major Elective Paper (any TWO)

1. Acoustics
2. Quantum Mechanics
3. Solid State Physics

Practical III

Practical IV

Practical V

VI Semester

Core Paper IX	Nuclear physics GMPH61
Core Paper X	Spectroscopy GMPH62
Core Paper XI	Digital Electronics GMPH63

Major Elective Paper (any ONE)

4. Statistical mechanics GMPH6A
5. Energy Physics

Practical III

Practical IV

Practical V

SEMESTER - III

PAPER V

ELECTRICITY AND MAGNETISM

Unit I

Electrostatics: Coulomb's law – electric field – electric dipole – electric flux – Gauss's Law – applications, spherical surface, cylindrical surface, parallel plate– electric potential – relation connecting electric potential and electric field – potential at a point due to a point charge – potential due to an electric dipole – capacity – capacitance of a spherical and cylindrical capacitor – energy of a charged capacitor – Loss of energy due to sharing of charges.

Unit II

Chemical Effects of Electric Current: Faraday's Laws of Electrolysis – electrical conductivity of an electrolyte – specific conductivity – Kohlrausch bridge – Thermoelectricity – Seebeck effect – Peltier effect – Thomson effect – total e.m.f – thermodynamics of thermocouple – thermoelectric power diagram – its uses – applications.

Unit III

Transient Current: Growth and decay of current in a circuit containing resistance and inductance – Growth and decay of charge in a circuit containing resistance and capacitance – Determination of high resistance by leakage – Growth and decay of charge in a LCR circuit – condition for the discharge to be oscillatory – Frequency of Oscillation.

Unit IV

Alternating Current: j operator – properties – use of j operator in the study of A.C Circuit with R only – inductance only – capacitance only – LCR series and parallel circuits – power in an AC circuit – Wattless current – choke coil – construction and working of AC generator, 1 phase and 3 phase AC generator – distribution of 3 phase AC – star connection – delta connection.

Unit V

Magnetic Properties of Materials: Magnetic induction – Magnetism – Relation between B, H and M – Magnetic susceptibility – Magnetic permeability – Relation between them – Electron theory of dia, para and ferromagnetism – Determination of susceptibility – Curie balance method – Moving coil Ballistic galvanometer – construction – theory – correction for damping in B.G – Measurement of Charge sensitiveness – absolute capacity of a condenser.

Books for Study and reference:

- 1.Electricity and Magnetism - D.N. Vasudeva
- 2.Electricity and Magnetism - Brijlal and Subramanian
- 3.Electricity and Magnetism - R. Murugesan
- 4.Electricity and Magnetism - K.K. Tewari
- 5.Halliday Rhesnick walker Ed 6 Wiley

MAINTAINANCE OF ELECTRICAL EQUIPMENT

(Skilled Based Subject)

Unit-I

Network Analysis: Direct Current and Alternating Current, power , Ohms law, Kirchoff's Laws - resistances, capacitances combination in series, parallel - problems

Unit-II

Two Port Networks: Resistance, impedance and reactances, Impedance Parameters, Admittance Parameters, Hybrid Parameters, Inverse Hybrid Parameters,

Unit-III

Electrical bulb, choke, starter, tube light wiring, CFL functioning, LED lighting , staircase switch, domestic wiring, fuse, ELCB,(Earth leak circuit breaker), circuit breaker(MCB),

Unit-IV

Transformers, Electric iron, fan, mixer , grinder, refrigerator, circuit diagram and working

Unit-V

Soldering and Desoldering Techniques : Grove board, bread board, printed circuit board, wave soldering

Reference Books.:

1. Circuits and Networks by A. Sudhakar and Shyam Mohan
2. Instrumentation Repair and Maintenance by R.G. Gupta
3. Basic Electronics and Linear Circuits by Bhargava & Kulshreshtha (TTTTI)
4. Integrated Electronics by Millman and Halkias
5. Instrumentation Cooper
6. Internet

APPLIED PHYSICS - NUMERICAL METHODS

1. (Skilled Based Subject)

Unit I

Solution of linear system by Gaussian elimination and Gauss-Jordon method– Iterative method

Gauss-Seidel method - Inverse of a matrix by Gauss Jordon method –

Unit II

Interpolation and approximation: Lagrangian Polynomials – Divided differences – Interpolating with a cubic spline – 's forward and backward difference formulas.

Unit III

Numerical differentiation integration Differentiation using interpolation formulae – Numerical integration by trapezoidal rule

Unit IV

Numerical differentiation integration Simpson's 1/3 and 3/8 rules – Romberg's method – Two and Three point Gaussian quadrature formulae

Unit V

Initial value problems for ordinary differential equations Single step methods: Taylor series method – Euler method for first order equation –

TEXT BOOKS

1. Veerarjan, T and Ramachandran, T., “Numerical methods with programming in C”, Second Edition, Tata McGraw-Hill Publishing.Co.Ltd, 2007.
2. Sankara Rao K, “Numerical Methods for Scientists and Engineers”, 3rd Edition, Printice Hall of India Private Ltd, , 2007.
3. [Introductory Methods Of Numerical Analysis 4Th Ed. - S.S. Sastry .](#)

IV SEMESTER
PAPER VI
OBJECT ORIENTED PROGRAMMING WITH C++

UNIT-I:

Evolution of C++ - applications of C++ - structure of C++ program. Tokens – keywords – identifiers and constants – basic data types – user-defined data types – constant pointers and pointers to constants – symbolic constants – type compatibility – declaration of variables – dynamic initialization of variables – reference variables – operators in C++ - scope resolution operator – memory management operators – manipulators – type cast operator – expressions and their types – special assignment expressions – implicit conversions – operator precedence.

UNIT-II:

Functions in C++ : The main function – function prototyping – call by reference – return by reference – inline functions – default arguments – const arguments – function overloading. Managing Console I/O Operations: C++ streams – C++ stream classes – unformatted console I/O operations – formatted console I/O operations – managing output with manipulators.

UNIT-III:

Classes and Objects: Specifying a class – defining member functions – making an outside function inline – nesting of member functions – private member functions – arrays within a class – memory allocation for objects – arrays of objects – objects as function arguments – friend functions – returning objects – const member functions.
Constructors and Destructors: Introduction – constructors – parameterized constructors – multiple constructors in a class – constructors with default arguments – copy constructor.

UNIT-IV:

Operator Overloading: Introduction – defining operator overloading – overloading unary operators – overloading binary operators - overloading binary operators using friends – rules for overloading operators.
Inheritance: Introduction – defining derived classes – single inheritance – making a private member inheritable – multilevel inheritance – multiple inheritance – hierarchical inheritance – hybrid inheritance

UNIT-V:

Working with Files: Introduction – Classes for File Stream Operations - Opening and Closing a File – Detecting End-of-file – More about open(): File Modes – File Pointers and their Manipulations – Sequential Input and Output Operations – Updating a File: Random Access.

Text Books:

1. E.Balagurusamy - 'Object Oriented programming with C++', McGraw Hill.
2. D.Ravi Chandran – 'Programming with C++', Tata McGraw-Hill publishing company limited (1996), New Delhi.

MAINTAINANCE OF ELECTRONIC EQUIPMENT

(Skilled Based Subject)

Unit I

Practical use of: Multimeter (measurement of voltage, current, resistance). Ground, Virtual ground, AC ground. Power Supply , concept of constant voltage source. Oscilloscope (voltage and frequency measurement) - .AC/DC coupling, triggering, XY mode lessajous figures

Unit II

Study of Electronic Components: Resistor - colour coding, wattage rating, potential divider arrangement. ,capacitance, -types ,colour coding, working voltage. Transistor as a switch..Clipping clamping

Unit III

Testing of electronic components. Diode, zenner, transistor, FET, OP Amps, timer 555, gates 7400,7402, 7404, 7408, 7432, Regulators 7805, 7809, 7909

Unit IV

Construction on regulated power supply using series regulator or IC. . Designing an voltage amplifier. Trouble shooting an audio amplier..

UnitV

Inverter - charging from mains, charging from mains or solar pannel, TV panels CRT ,LCD,Plasma,LED

Reference Books:

1. Integrated Electronics by Millman and Halkias
2. Operational Amnifier by Gyakwar
3. Electronic Communication System by George Kenedy
4. Electronic principles – Malvino Ed 6

PHYSICS FOR COMPETITIVE EXAMINATIONS

(Skilled Based Subject)

Unit I

Potential Energy, Path dependence of conservative forces, Determining PE values, Conservation of mechanical energy, Reading a PE curve, work done on a system by external forces, Conservation of energy

Unit II

Avogadro's number, Ideal gases, Pressure, temperature and RMS speed, Translational KE, Mean free path, Distribution of molecular speeds, molar specific heats of ideal gases, degrees of freedom and specific heats, quantum theory basics, adiabatic expansion of ideal gas

Unit III

Electric potential energy, Electric potential, equipotential Surfaces, Calculating potential from field, Potential due to a group of charges, PE for a group of charges, PE due to a dipole, PE due to continuous distribution, calculating Field from Potential, Potential of a system of point charges, potential of a charged conductor.

Unit IV

Diffraction and wave theory, single slit maxima, minima, intensity single slit diffraction, circular aperture, double slit, gratings, dispersion, resolving power,

Unit V

Waves on a string and matter waves, Energies of trapped electrons, wave function of trapped electrons, finite well, different electron wells, hydrogen atom

Text book :

Halliday Rhesnick walker Ed 6 Wiley Chap 11,20,25,37,40 All problems from
Halliday Rhesnick walker Ed 6 Wiley (In respective chapters)

PHYSICS PRACTICAL-II

1. Potentiometer- Calibration of Voltmeter by standardization method (Low range).
2. Potentiometer- Calibration of ammeter.
3. TG – H
4. Series Resonance Circuit.
5. Parallel Resonance Circuit.
6. Comparison of capacities of condensers and emfs of cells- B.G
7. Owen's Bridge – Inductance in series & Parallel
8. Zener diode characteristics and regulated power supply using Bridge rectifier.
9. Transistor characteristics -Common Emitter
10. De-Sauty's Bridge- Capacitance in series & parallel
11. Potentiometer r_1/r_2
12. Charge sensitivity BG

V SEMESTER PAPER VII ATOMIC PHYSICS

UNIT I

The electron ,band theory of solids and positive rays : The free Electron Theory of metals – Expression for electrical conductivity – expressions for thermal conductivity – Determination of the electronic charge : Millikan's oil drop method-electron microscope – band theory of solids – classification of solids on the basis of band theory – optical properties of solids - - energy bands :Brillouin zones-origin of forbidden bands

UNIT II

Properties of positive rays – positive ray analysis – Thomson's parabola method- Aston's mass spectrograph – Bainbridge's mass spectrograph – Dempster's mass spectrograph – mass defect and packing fraction- Dunnington's method of determining e/m

UNIT III

Structure of atom : The vector atom model – quantum numbers associated with the the vector atom model – coupling schemes – the Pauli exclusions exclusion principle – the periodic classification of elements – magnetic dipole moment due to orbital motion of the electron- magnetic dipole moment due to spin-the Stern and Gerlach experiment- quantum mechanical explanation of normal and anomolous Zeeman effect.

UNIT IV

X-rays: Production of X-rays – spacing between three dimensional lattice planes – the absorption of X-rays – X-ray absorption edges – Bragg’s law – the Bragg’s X-ray spectrometer – the powder crystal method –(a) the Laue method - (b) rotating crystal method – X-ray spectra – characteristic of X-ray spectrum – Moseley’s law – Compton scattering

UNIT V

Photoelectric effect and planck’s quantum theory: Experimental investigations on the photoelectric effect – failure of electromagnetic theory-Einstein’s photoelectric equation – photoelectric cells – Planck’s quantum theory-the distribution of energy in the spectrum of a black body-Wien’s displacement law-Planck’s hypothesis-derivation of Planck’s law of radiation

Books for reference:

1. MODERN PHYSICS - By R.Murugesan and Kiruthiga Sivaprasath (14th Revised multicolour edition) ,S.Chand & Company Ltd. Ram nagar ,New Delhi-110055
2. MODERN PHYSICS - By B.S.Agarwal,Kedarnath Ramnath,Meerut,Delhi
3. ATOMIC AND NUCLEAR PHYSICS- N.Subrahmanyam Brijlal, S.Chand & Company Ltd. Ram nagar ,New Delhi-110055
4. MODERN PHYSICS – B.V.N. Rao,Wiley Eastern Ltd,New Delhi
5. An Introduction to MODERN PHYSICS- P.Mahendru,16/7698 New market,New Rohtak road, Satyaprakashan ,New Delhi-11
6. Halliday Rhesnick walker Ed 6 Wiley

PAPER VIII

BASIC ELECTRONICS

Unit I

Linear Circuits and Semiconductors: Voltage source – Constant Voltage source – Constant current source – Conversion of voltage source into current source – Maximum power transfer theorem- Thevenin’s theorem – Norton’s theorem - Semiconductor – bonds in semiconductors – Commonly used semiconductors – effect of temperature in semiconductors – intrinsic and extrinsic semiconductors – P and N type semiconductors.

Unit II

Diodes and Transistors: PN junction diode – diode characteristics – Zener diode – Zener as voltage regulator - transistor – transistor action – three modes of connection – common emitter characteristics – transistor biasing methods – stability factor – CE amplifier.

Unit III

Oscillators and Modulation: Feedback – principles – gain – advantage – sinusoidal oscillators – tank circuit – Colpitt's Oscillator – Hartley Oscillator – Wien's Oscillator – modulation – AM – modulation index – analysis – modulator – FM – Demodulation.

Unit IV

FET and Electronic Instruments: FET – working – importance – Difference between FET and transistor – FET as amplifier – output characteristic – important terms – expression for drain current – advantages – FET parameters – UJT – equivalent circuit – Characteristic – advantages – applications – Multimeter – applications – merits and demerits – CRO and its applications.

Unit V

Operational amplifier: Op amp – Schematic symbol – output voltage – AC analysis – band width – slew rate – frequency response – op amp with negative feedback – applications – inverting amplifier – input and output – impedance of inverting amplifier – Non inverting amplifier – voltage follower – summing amplifier – adder – subtractor – integrator – differentiator – comparator.

Book for Study:

Principles of Electronics - .K.Mehta and Rohit Mehta, S.Chand and Company Ltd. New edition
Electronic principles – Malvino Ed 6

ACOUSTICS (Major Elective Paper)

Unit I

Velocity of sound: Velocity of longitudinal waves in gases – Newton's formula for velocity of sound – Laplace correction- Effect of temperature – Effect of pressure – Effect of density of the medium – Effect of humidity – Effect of wind – Velocity of sound in water – Velocity of sound in air – Velocity of sound in isotropic solids – Wave velocity and molecular velocity

Unit II

Vibrations in strings and air columns : Velocity of transverse waves along a stretched string – Laws of transverse vibration of strings – Verification of the laws of transverse vibrations of strings using sonometer– Melde's experiment – Vibrations in rods – Kundt's tube – Helmholtz resonator – Theory of resonator

Unit III

Doppler effect and beats: Doppler effect – Observer at rest and source in motion – Source at rest and observer in motion – When both the source at rest and observer in motion – Beats – Analytical treatment of beats – Characteristics of musical sound – Measurement of intensity of sound—decibel and phon – Bel – Phon – Limits of audibility

Unit IV

Acoustics of buildings: Acoustics – Reverberation – Sabine's reverberation formula – Determination of absorption coefficient – Acoustic intensity – Acoustic measurements – Factors affecting the acoustics of buildings – Requisites for good acoustics

Unit V

Practical applications: Falling plate method – Determination of frequency of a tuning fork by stroboscopic method – Sound ranging – Locating the direction of aircraft – Wave front at supersonic speeds : Flight of the bullet – Production of ultrasonic waves – Detection of ultrasonic waves – Acoustic grating – Applications of ultrasonic waves

Book for study:

WAVES AND OSCILLATIONS – N.Subrahmanyam Brijlal ,Vikas Publishing House Pvt Ltd,576,Masjid Road,Jangpura,New Delhi-110014

Books for reference:

1. College Physics Vol.II - A.B.Gupta, Books and Allied (P) Ltd,No.1-E(1) Shubam Plaza (1st floor),83/1 Beliaghata Main road,Kolkata-700010
2. Sound –M.Narayanamoorthy &N.Nagaratnam,The National Publishing &Co ,Chennai-600001
3. Halliday Rhesnick walker Ed 6 Wiley

QUANTUM MECHANICS

(Major Elective Paper)

Unit I

Quantum Theory: Limitations of classical theory – Black body radiation – Black body radiation - Max Planck's theory of quantum radiation – Einstein's theory of Photo electric effect – Compton effect – specific heat of solids – Bohr model of hydrogen atom – inadequacy of quantum theory – De Broglie's wave nature of particles – wave packet and its significance – wave packet and its motion.

Unit II

Wave Mechanics: The uncertainty principle – single slit experiment – Uncertainty for other variables – Applications of Uncertainty principle – Schrodinger wave equation – Time dependent and Time independent forms – Interpretations of wave function – Probability current density – Expectation values – Ehrenfest's theorem.

Unit III

Quantum Mechanics: Linear vector space – Orthogonal functions – eigen functions and eigen values – Orthonormality of eigen functions – energy eigen values are real – linear operator – Hermitian operator – Postulates of Quantum mechanics – Simultaneous measurements and commuting operators – The adjoint or self adjoint of an operator – Dirac's notation – Equations of motion in Schrodinger representation

Unit IV

Simple applications: Particle in one dimensional Square well with infinite walls - Square well with finite walls – Potential step – Square potential barrier – barrier penetration – Alpha emission

Unit V

Simple applications: Bloch waves in periodic potential –Kronig – Penny square well periodic potential – linear Harmonic Oscillator – Schrodinger method – Operator method – The free particle.

Book for Study:

1. Quantum Mechanics - G.Aruldas , PHI Pvt Ltd. New edition
2. Quantum Mechanics - G.S.Chaddha, New Age International Publishers, New edition
3. Halliday Rhesnick walker Ed 6 Wiley

SOLID STATE PHYSICS

(Major Elective Paper)

Unit I

Crystal Structure: Lattice Translation Vectors- Basis And The Crystal Structure- Primitive Lattice Cell- Types Of Lattices- Two Dimensional Lattice Types- Three Dimensional Lattice Types -Index System For Crystal Planes- Sodium Chloride Structure- Cesium Chloride Structure

Unit II

Reciprocal Lattice: Miller Indices – Perpendicular Distance Between Two Parallel Planes - Braggs Law- Wiener Seitz Cell- Reciprocal Lattice Vectors- Brillouin Zones- Reciprocal Lattice To SC Lattice- - Reciprocal Lattice To BCC Lattice- Reciprocal Lattice To FCC Lattice- Quasicrystals

Unit III

Dielectric Properties: Local Field – Clausius - Mossotti Relation – Polarizability - Electronic Polarizability – Ionic Polarizability – Orientational Polarizability – Dielectric Constant – Frequency Dependence Of Dielectric Constant - Measurement Of Dielectric Constant – Ferro Electricity – Hysteresis – Piezoelectricity

Unit IV

Superconductivity: Experimental Survey – Occurrence Of Superconductivity – Destruction Of Superconductivity By Magnetic Fields – Meissner Effect – Type I – Type II Superconductor – Heat Capacity – Energy Gap – Microwave And Infrared Properties – Isotope Effect – Thermodynamics Of The Superconducting Transition

Unit V

Superconductivity: London Equation – Coherence Length – BCS Theory Of Superconductor – Duration Of Persistent Currents – Theory of Type II Superconductor – Vortex State – Estimation Of H_{c1} And H_{c2} – Single Particle Tunneling – DC Josephson Effect – AC Josephson Effect

Reference Book:

1. Introduction To Solid State Physics (8th Ed) - Charles Kittel
2. Solid State Physics – R.J. Singh – Pearson Education

VI SEMESTER PAPER IX NUCLEAR PHYSICS

UNIT – I

Atomic Nucleus : General properties of nucleus - Binding energy - Mass defect - Proton - proton hypothesis - proton neutron hypothesis - Nuclear forces - Characteristics of nuclear forces - Liquid drop model - Weizsacker semi-empirical mass formula - Shell model - Magic Numbers

UNIT – II

Natural radioactivity - alpha, beta and gamma rays - properties - Radioactive series - Laws of radio active disintegration - Radio - Carbon dating - Alpha decay - Beta decay - Neutrino and its properties - Gamma decay - Internal Conversion - Nuclear energy levels - Nuclear isomerism

UNIT – III

Particle accelerators: Cyclotron - Betatron – Synchrotron - Types of Nuclear reaction - Q value of Nuclear Reactions - The balance of mass and energy in Nuclear reactions - Nuclear transmutations.

UNIT – IV

Energy from the Nucleus: Nuclear fission - Types of fission - P-E Curve for fission - Bohr Wheeler's Theory of Nuclear fission - Nuclear fusion and Thermonuclear reactions - Controlled thermonuclear reactions - Nuclear chain reaction - critical size of a reactor - radiation hazards.

UNIT – V

Detection and measurements of Nuclear radiations Elementary particles : G-M Counter - Scintillation Counter - Cloud Chamber Bubble Chamber - Cerenkov Counters - Classification of elementary particles - Particle interaction - Conservation Laws - Leptons - Hardons - The Quark model

Books for Reference:

1. Nuclear Physics by Irving Kaplan
2. Nuclear Physics by D.C Tayal
3. Halliday Rhesnick walker Ed 6 Wiley

PAPER X

SPECTROSCOPY

Unit I

Microwave spectroscopy: The rotation of molecules, its spectra, Diatomic molecules – rigid diatomic molecule – intensities of spectral lines, effect of isotopic substitute, Non- rigid rotator – its spectrum, Polyatomic molecules – linear, symmetric top, asymmetric top molecules. Techniques and instrumentation, chemical analysis by microwave spectroscopy.

Unit II

Infrared Spectroscopy: Vibrating diatomic molecule – energy of diatomic molecule, harmonic and anharmonic oscillator, vibrating rotator – co- vibrating rotator spectrum, interaction of rotations and vibrations – vibrations of polyatomic molecules – fundamental vibrations and their symmetry – overtones and combination frequencies. Analysis by IR techniques.

Unit III

Raman spectroscopy: Theory of Raman effect. Pure rotational Raman spectra – linear, symmetric top, spherical top, asymmetric top molecules. Pure vibrational Raman spectra – Raman activity of vibration rule of mutual exclusion, overtones and combination vibrational spectra, nature of light polarized, vibration of spherical top molecules and other type of molecules. Structural determinations from Raman and IR spectroscopy,

Unit IV

Electronic spectroscopy: Born – Oppenheimer approximation vibrational coarse structure (Progression), intensity of vibrational electronic spectra, (Franck –condon principle), dissociation energy and dissociation products. Vibrational spectra Vibrational fine structure (Rotation), fortart diagram, predissociation, diatomic molecular electronic spectra.

Unit V

Instrumentation: Techniques and instrumentation – Outline, single and double beam arrangement in IR spectroscopy..

Books for Study:

- 1 Fundamentals of molecular spectroscopy C.N.Banwell, Tata McGraw Hill Publishing Co. Ltd., 3rd Edition (1972).
- 2 Lasers and non linear optics, B.B. Laud Wiley Eastern Ltd., (1985).

PAPER XI

DIGITAL ELECTRONICS

Unit-I

Number Systems: Introduction to Decimal, Binary, Octal, Hexadecimal Number Systems and their inter-conversions; BCD codes, Excess-3 codes, Gray codes, Cyclic codes, code conversions; parity, binary arithmetic, 1's and 2's compliments

Unit-II

Boolean Algebra: postulates and theorems of Boolean algebra, De-Morgan's Theorem, Reducing Boolean expressions. Logic Gates: Positive and Negative Logic, Basic Logic Gates : AND, OR, NOT (symbol, truth-table, circuit diagram, working); NAND, NOR, EX-OR, EX-NOR (symbol, truth-table).

Unit-III

Minimization Techniques: Introduction, SOP and POS form of Boolean functions, Karnaugh Map simplifications (upto 4 variables), implementations of SOP and POS form using NAND and NOR gates.

Unit-IV

Combinational circuits: half adder, full adder, 8421 adders, 1's & 2's complement adder/subtractor, Excess-3 adder, multiplexer, demultiplexer, encoders and decoders.

Unit-V

Sequential circuits: Flip-Flop (RS, JK, Master-Slave JK, D and T-type), Shift Register, Binary Counters, Modulo-N counter, up-down counter.

Reference Books:

1. Digital Electronics Malvino Leach
2. Digital Electronics by R.P. Jain

STATISTICAL MECHANICS (Major Elective Paper)

Unit I

Statistical basis- probability- principle of equal a priori probability -microstate and macro state- thermodynamic probability -constraints on a system -static and dynamic systems -most probable state (equilibrium state) -concept of a cell in a compartment -ensemble and average properties

Unit II

Degrees of freedom -position space -momentum space- phase space- the μ - space and γ space- applications -fundamental postulates of statistical mechanics -density of quantum states of energy of a particle-statistical ensembles- comparison of ensembles- theories based on statistical mechanics -entropy and probability- Boltzmann's canonical distribution law- applications of Boltzmann's canonical distribution law-

Unit III

The law of equipartition of energy- statistical interpretation of second law of thermodynamics- partition function and its relation with thermodynamic quantities -entropy of an ideal gas- Gibbs paradox

Unit IV

Three kinds of particles -M.B statistics applicable to ideal gas -Maxwell Boltzmann energy distribution law - applications of M.B distribution law -mean rms and most probable speeds- Maxwell's distribution law of velocities-experimental verification Maxwellian distribution of molecular speeds

Unit V

Need of quantum statistics -development of quantum statistics- Bose Einstein distribution law- photon gas- Plank's radiation law -Fermi Dirac distribution law-free electrons in metal:electron gas= Fermi level and Fermi energy – E_F for electrons in a metal-comparison of the three statistics -difference between classical and quantum statistics

Reference Book:

Heat thermodynamics and statistical physics: Brij Lal N.Subramaniam P.S Hemne S.Chand publications

Unit-1 Chapter 9.1-9.3 ,9.7,9.8, 9.10-9.12 9.14-9.15

Unit-2 Chapter 10.1-10.5 10.6-10.11, 10.14-10.17

Unit- 3Chapter 10.18-10.21

Unit-4 Chapter 11.1-11.6 11.8-11.9

Unit-5 Chapter12.1-12.2 ,12.5-12.11 12.14-12.16

ENERGY PHYSICS (Major Elective Paper)

Unit I

Conventional Energy Sources: World's reserve of commercial energy sources and their availability - various forms of energy - renewable and conventional energy systems - comparison - coal, oil and natural gas - availability - statistical details - applications - merits and demerits. Nuclear energy – merits and demerits

Unit II

Non-Conventional Energy Sources: Renewable energy sources - solar energy - nature of solar radiation - components - solar heaters - crop dryers - space cooling - solar ponds, solar cookers - water desalination - photovoltaic generation basics - merits and demerits of solar energy.

Unit III

Biomass energy: Biomass energy - classification - photosynthesis - biomass conversion process - gobar gas plants - wood gasification - ethanol from wood - advantages and disadvantages of biomass as energy source

Unit IV

Geothermal energy - wind energy - ocean thermal energy conversion (OTEC) - energy from waves and tides (Basic ideas, nature, applications, merits and demerits of these).

Unit V

Impacts of Conventional Energy: Energy crisis and possible solutions - energy options for the developing countries - energy storage and hydrogen as a fuel(basics) - impact due to conventional energy sources – Thermal, Hydel , Nuclear - global warming- ecological damage - Nuclear pollution (leaks, accidents, nuclear waste disposal).

Text Books:

1. Solar Energy by G.D. Rai, Ed. V, 1995.
2. Solar energy by S.P. Sukhatme, Tata McGraw-Hill Publishing Company, Ed. II, 1997.

Reference Books:

- 1 Non Conventional Energy Sources, G.D. Rai, 4th Edition, 1997.
- 2 Energy Technology by S. Rao and Dr. B.B. Parulekar 2nd Edition, 1997.
- 3 Power Plant technology by A.K. Wahil 1993
- 4 Renewable Energy: Power for a sustainable Future by Godfery Boyle, Alden Oess Ltd., Oxford, 1996.
- 5 Energy models for 2000 and beyond by Jyoti Parikh, Tata McGraw Hill Publishing Company, New Delhi, 1997.

PRACTICAL III

1. Young's Modulus of glass- Elliptic fringes.
2. Spectrometer- Cauchy's Constant.
3. Spectrometer Grating-Oblique incidence.
4. Spectrometer- Hartmann's formula.
5. Spectrometer- I1- I2 curve(Experimentally finding I1 or I2).
6. **Absolute determination of capacity of condenser- B.G**
7. Absolute determination of mutual inductance .
8. High resistance by leakage- B.G.
9. Thermo emf -M.G.
10. Potentiometer- Calibration of High Range Voltmeter.
11. Potentiometer- Temperature coefficient of resistance.
12. Network theorem- Verification- Thevenin's & Norton's theorem.
13. Comparison- of mutual inductances - B.G.
14. Spectrometer- I- d curve.

PRACTICAL IV

1. Dual power Supply Using IC 78--,79--. EASY - BREAD BOARD
2. FET Characteristics. VERY EASY - TRAINER KIT
3. NAND and NOR as universal building block. EASY - LAB BOARD
4. Single Stage amplifier with and without feedback.
5. Wein's bridge Oscillator. - CRO NEEDED
6. Colpitt's Oscillator and Hartley oscillator. - CRO NEEDED
7. Astable multi vibrator using timer. EASY - CRO NEEDED
8. Monostable multi vibrator using timer. EASY - CRO NEEDED
9. OP-AMP Adder and Subtractor. EASY - TRAINER KIT
10. OP-AMP Differentiator and Integrator. EASY - CRO NEEDED
11. OP-AMP Low pass and high pass filters. EASY
12. Half and Full Adder-IC. EASY - TRAINER KIT

PRACTICAL V

1. To read any two numbers through the key board and to perform simple arithmetic operations (i.e. addition, subtraction, multiplication and division) and display the results using Cin and Cout functions. Use do-while loop.
2. To test the validity of any entered character whether it belongs to the alphabetical set or a number or a special character.
3. To find the sum of series using for loop.
 - a. Sum = $1+3+5+\dots+n$.
 - b. Sum = $x-x^3/3! +x^5/5!-x^7/7!+\dots+x^n/n!$
 - c. Sum = $1+2^2+4^2+\dots+n^2$.
4. To find the factorial of a number by using function declaration with/without using the return statement.
5. To read a set of numbers from a standard input device and to find out the largest number in the given array using function declaration. Also sort them in the ascending or the descending order.
6. To read the elements of the given two matrices of order $m*n$ and to perform the matrix addition and display the transpose of the result.
7. a) To display the content of an array using pointer arithmetic.
b) To read the data variables (Such as Day, Month and Year) of the class by the member function and display the contents of class objects on the screen in the format DD/MM/YYYY.
8. To generate a series of Fibonacci numbers using constructor.
9. To read the following information from the keyboard in which basic class consists of Name, Roll No. and Sex. The derived class contain the data members Height and weight. Display the contents of the class. Use inheritance concept.
10. An OOP to find the period of a pendulum of given length L , in a gravitation field. Accept the required values using the keyboard. Also display the results.
11. Develop a program in C++ to calculate the Young's modulus of a material from the data obtained from uniform bending method.
12. Solve Quadratic equation.
13. Multiplication of two matrices.

III SEMESTER
NON MAJOR ELECTIVE
BASIC PHYSICS I

Unit I

Electrification by friction - two kinds of charges - capacitor - principle of condenser - types of condensers - fixed condenser - variable condenser.

Unit II

Transformer, electric iron, fan, tube light, CFL, LED lighting

Unit III

Ohm's law - electrical energy and power - resistance - types of resistance - fixed resistance - variable resistance.

Unit IV

Colour codes - resistance in series - resistance in parallel - serial sets

Unit V

Direct current alternating current. motor, solar pannel

Books for study:

1. Electricity and Magnetism - R. Murugesan.
2. Electricity and Magnetism - Brijlal and Subramaniam

ENERGY PHYSICS
(Non Major Elective)

Unit I

Conventional Energy Sources: World's reserve of commercial energy sources and their availability - various forms of energy - renewable and conventional energy systems -

Unit II

Non-Conventional Energy Sources: Renewable energy sources - solar energy - nature of solar radiation - components - solar heaters - crop dryers - space cooling - solar ponds, solar cookers

Unit III

Biomass energy: Biomass energy - classification - photosynthesis - biomass conversion process - gobar gas plants - wood gasification -

Unit IV

Geothermal energy - wind energy - ocean thermal energy conversion (OTEC)

Unit V

Impacts of Conventional Energy: Energy crisis and possible solutions - energy options for the developing countries - energy storage and hydrogen as a fuel(basics) - impact due to conventional energy sources –

Text Books:

1. Solar Energy by G.D. Rai, Ed. V, 1995.
2. Solar energy by S.P. Sukhatme, Tata McGraw-Hill Publishing Company, Ed. II, 1997.

Reference Books:

1. Non-Conventional Energy Sources, G.D. Rai, 4th Edition, 1997.
2. Energy Technology by S. Rao and Dr. B.B. Parulekar 2nd Edition, 1997.
3. Power Plant technology by A.K. Wahil 1993
4. Renewable Energy: Power for a sustainable Future by Godfery Boyle, Alden Oess Ltd., Oxford, 1996.
5. Energy models for 2000 and beyond by Jyoti Parikh, Tata McGraw Hill Publishing Company, New Delhi, 1997.

IV SEMESTER
BASIC PHYSICS II
(Non Major Elective)

Unit-I

Temperature, Quantity of heat, Conversion of heat to work, heat engine 2 stroke, refrigerator

Unit-II

Rainbows, colors of thin films, convex, concave lens, focal length, telescope and microscope

Unit-III

Magnet pole strength, dipole moment, dia para ferro ferri magnetic substances, compass

Unit-IV

Matter, states of matter, crystalline, amorphous materials, good and bad conductors, superconductors

Unit-V

LASER –He Neon LASER , application in communications

DESCRIPTIVE PHYSICS (No derivation)
(Non Major Elective)

Unit I

Mechanics: Motion, Force and Newton's laws - momentum - projectile and circular motions - gravitation - planetary motion and earth satellites – communication satellites - work, power and energy - energy and environment – rotational motion.

Unit II

Properties Of Matter: Three states of matter - binding forces - fluid pressure and thrust - applications - Pascal law - Archimedes principle – capillary action - Bernoulli's principle - Viscosity.

Unit III

Heat And Sound: Measurement of heat and temperature - clinical thermometer - heat transfer - thermos flask - change of state - effect of pressure on boiling point and melting point - heat engines - steam engine and diesel engine. sound and music - reverberation - acoustics of building - recording and reproduction of sound in film.

Unit IV

Electricity And Magnetism: Colomb's law - action of points, lightning arrester - Ohm's law - electric power - electrical safety - electromagnetic induction - Faraday's Law - Lenz Law - transformers - mariner's compass.

Unit V

Optics: Light - optical instruments - camera - telescope - microscope - projector - nuclear energy - fission and fusion - nuclear power plants - atom bomb and hydrogen bomb.

Books for study:

1. University Physics, Sears & Zemansky.
2. Advanced level Physics, Nelkon & Parker.
3. Electricity and Magnetism, Brijlal and Subramaniam.

MODEL QUESTION

Time : Three hours

Maximum : 75 marks

PART – A (10 X 1 = 10 marks)

Answer all questions.(Choose the correct answer.)

- The electric potential at any point due to an electric dipole varies
 - directly with distance
 - various inversely as distance
 - varies inversely as square of distance
 - varies inversely as cube of distance
- The energy stored in a capacitor of given capacitance is
 - directly proportional to p.d. between the plates
 - directly proportional to the square of p.d between the plates
 - inversely proportional to the square of p.d between the plates
 - None of the above
- In electrolysis, chemical reaction takes place
 - throughout the electrolyte
 - in between the electrodes
 - at the electrodes
 - all the above
- Thermoelectric power diagram relates
 - thermo e.m.f diagram relates
 - Peltier e.m.f and temperature
 - Thomson e.m.f and temperature
 - Thermoelectric power and temperature
- The time constant of growth of charge in an LR circuit, applied with d.c. voltage is
 - LR
 - L/R
 - R/L
 - Rt/L
- In d.c. circuit with LCR connected in series, the condition for oscillatory discharge is
 - a)
 - b)
 - c)
 - d)
- Power factor of resistor is
 - One
 - 70.7%
 - 0.25%
 - 29.3%
- Wattless current is called so because while it is flowing through the circuit element it causes
 - no phase change between voltage and current vectors
 - no voltage to appear across the element
 - no power consumption in the circuit
 - None of the above
- The magnetic induction at a place is expressed in terms of
 - A/m²
 - A/m
 - tesla
 - weber per metre
- Ballistic galvanometer is meant for measuring
 - steady current
 - large current
 - momentary charge
 - deflection

PART – B (5 x 5 = 25 marks)

Answer all questions. (Choosing either (a) or (b))

11. a) Deduce coulomb's law from gauss law.
(or)
b) Derive an expression for the capacity of a cylindrical capacitor.
12. a) State and explain Faraday's laws of electrolysis. Also define one Faraday.
(or)
b) Define seebeck effect, Peltier effect, Peltier coefficient, Thomson effect and Thomson coefficient.
13. a) Deduce expression for time constant of an LR circuit during decay of current in the circuit.
(or)
b) Discuss the growth of charge in a CR circuit impressed with d.c. voltage.
14. a) The parallel LCR circuit is formed with a coil of self inductance 350 H, the circuit is tuned to a frequency of 200 KHZ and the impedance across the circuit is found to be 17,600 . Calculate Q of the circuit.
(or)
b) Describe the three phase AC generator. Also explain the distribution of three phase current by (i) star connection and (ii) delta connection.
15. a) Explain M, B and H and derive the relation connecting them.
(or)
b) A small bar of iron is placed in a magnetizing field of intensity 1000 amp-turns / m. If the magnetic induction in the specimen is 1.2 web/m². Calculate its permeability and (ii) the susceptibility.

PART – C (5 x 8 = 40 marks)

Answer all questions. (Choosing either. (a) or (b))

16. a) Derive an expression for the electric potential at a point due to an electric dipole.
(or)
b) Derive an expression for the energy of a charged capacitor. Also derive an expression for loss energy when two capacitor share their charges.
17. a) Applying the second law of thermodynamics, obtain expression for (i) and
(ii) (a - b) for a thermocouple.
(or)

b) Define specific conductivity of an electrolyte. Describe the Kohlrausch bridge experiment to determine the specific conductivity of an electrolyte.

18. a) Discuss the growth of charge in an LCR circuit impressed with dc voltage. Explain the undamped, over damped and critical damping cases.

(or)

b) Describe, with relevant theory, an experiment to determine the value of high resistance by the method of leaking of charge through it.

19. a) Give the theory of the parallel resonance circuit. Obtain the expression for resonance frequency.

(or)

b) If a 30 ohms resistance and 40 ohms reactance coil are in series with 100 a.c source. Find (i) impedance of the circuit (ii) current in the circuit (iii) voltage across resistance (iv) voltage across the coil and (v) the phase angle between voltage and current in the circuit.

20. a) Define magnetic susceptibility. Describe Curie Balance method to determine magnetic susceptibility.

(or)

b) Explain how absolute capacitance of a capacitor is determined using a ballistic galvanometer.

APPENDIX – AZ45

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

CHOICE BASED CREDIT SYSTEM (CBCS)

COURSE STRUCTURE FOR B.Sc., CHEMISTRY

(With effect from the Academic Year 2012 – 2013 Onwards)

1. Objectives

- ★ To impart theoretical and practical skills that underpins the various branches of the science of Chemistry
- ★ To enable the students to have a thorough understanding and knowledge of different branches of Chemistry
- ★ To make the students to develop the ability to think analytically and solve problems.
- ★ To facilitate the students of B. Sc. Chemistry to join PG courses which in turn offer them job opportunities and research pursuits.
- ★ To apply the skills and knowledge gained through the subject to real life situations and face competitive examinations with confidence.

2. Eligibility for Admission

The minimum eligibility conditions for admission to the **B.Sc., Degree in Chemistry** program are given below.

The candidates for admission into the first semester of the **B.Sc., Degree in Chemistry** course will be required to have qualified the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Government of Tamil Nadu or any other Examinations accepted by the syndicate as equivalent there to in Science subject.

3. Duration of the Course

The students shall undergo the prescribed course of study for a period of not less than three academic years (Six semesters). The semester contains 90 working days.

4. Scheme of the Course

	Components	Hours	Credits
I Semester			
Part I	Tamil / Other Language (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	Core Subjects (Theory – T) (2 Courses)	8	8
	Paper 1. Inorganic Chemistry – I		
	Paper 2. Organic Chemistry – I		
	Practical (P) I (Volumetric analysis)	2	--
	Allied Subject I (1 Course)	4	4
	Practical	2	-
Part IV	Environmental Studies (1 Course)	2	2
	TOTAL (6 Courses)	30	20
II Semester			
Part I	Tamil / Other Language (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	Core Subjects (2 Courses)	8	8
	Paper 3. Inorganic Chemistry -II		
	Paper 4. Physical Chemistry -I		
	Practical I (Volumetric analysis)	2	2
	Allied Subject I (1 Course)	4	4
	Practical	2	2
Part IV	Value Based Education (1 Course)	2	2
	TOTAL (6 Courses)	30	24

III Semester				
Part I	Tamil / Other Language	(1 Course)	6	3
Part II	English	(1 Course)	6	3
Part III	Core Subjects	(1 Course)	4	4
	Paper 5. Physical Chemistry -II Practical II (Qualitative Analysis)		2	--
	Allied Subject II	(1 Course)	4	4
	Practical		2	--
Part IV	Skill Based Subject	(1 Course)	4	4
	Agrochemistry / Food Chemistry			
	Non-major Elective	(1 Course)	2	2
	Water management/ Food Chemistry			
	TOTAL (6 Courses)		30	20
IV Semester				
Part I	Tamil / Other Language	(1 Course)	6	3
Part II	English	(1 Course)	6	3
Part III	Core Subjects	(1 Course)	4	4
	Paper 6. Organic Chemistry –II Practical II (Qualitative Analysis)		2	2
	Allied Subject II	(1 Course)	4	4
	Practical		2	2
Part IV	Skill Based Subject	(1 Course)	4	4
	Chromatography / Dairy Chemistry			
	Non-major Elective	(1 Course)	2	2
	Clinical Chemistry / Applied Chemistry			
Part V	Extension activity (NCC, NSS, YRC, YWF)			1
	TOTAL (6 Courses)		30	25

V Semester			
Part III	Core Subjects (2 Courses)		
	Paper 7. Organic Chemistry - III Paper 8. Physical Chemistry –III Practical III Practical IV Practical V	8 3 P (3+3+2 = 8)	8 --
	Major Elective Elective I (1 Course) Polymer Chemistry / Industrial Chemistry Elective II (1 Course) Analytical Chemistry/ Pharmaceutical Chemistry	10	10
Part IV	Skill Based Subject (1 Course) Effective Communication / Personality Development	4	4
	TOTAL (5 Courses)	30	22
VI Semester			
Part III	Core Subjects (3 Courses)		
	Paper 9. Inorganic Chemistry-III Paper 10. Organic Chemistry -IV Paper 11. Physical Chemistry -IV Practical III Gravimetric Estimation & Inorganic preparation Practical IV Organic Analysis, Organic preparation & Determination of physical constants Practical V Physical Chemistry experiments	5 6 3 P (3+3+2 = 8)	5 12 7
	Major Elective (1 course) Bio Chemistry / Applied Chemistry	5	5
	TOTAL (7 Courses)	30	29

Total No. of courses : 36; Total credits : 140

5. Elective Subject

One among the two given subjects will be selected.

6. Extension Program for the Department

Apart from the curriculum, to enrich the skill development of the students following courses in their premises are conducted.

Communication Skill through IT

Personality development

Spoken English.

7. Internal Assessment

There is a separate passing minimum for the external and overall components.

Distribution of marks between External and Internal Assessment is

★ For Theory 75 : 25

★ For Practical 60 : 40

Pass minimum of 40% for external and overall components.

Internal Marks for Theory shall be allotted in the following

The average of the best two from three compulsory tests. Each test is of one hour duration	20 Marks
Assignment	05 Marks
TOTAL	25 Marks

Distribution of marks between External and Internal Assessment

for skill based elective - 60 : 40

The average of the best two from three compulsory tests. Each test is of one hour duration	20 Marks
Assignment / doing practical / project	20 Marks
TOTAL	40 Marks

Internal Marks for Practical shall be allotted in the following manner

Experimental Work	20 Marks
Record	10 Marks
Model Test	10 Marks
TOTAL	40 Marks

SEMESTER III
PHYSICAL CHEMISTRY II

UNIT I: THERMODYNAMICS-II

Introduction to second law of thermodynamics - spontaneous processes - statement of second law of thermodynamics.

Entropy: Definition –entropy a state function - Trouton's rule. -entropy change in reversible and irreversible processes- Clausius inequality- entropy as function of T and V - entropy as a function of T and P - entropy change in isothermal transformation - entropy change accompanying change of phase-- entropy of mixing of ideal gases -physical significance of entropy.

Free energy: Work and free energy functions – definition-general conditions of equilibrium and spontaneity – -physical significance of dA and dG . Temperature and pressure dependence of G - variation of G during isothermal change -Gibbs Helmholtz equation.

UNIT II: THERMODYNAMICS-III

Van't Hoff isotherm and isochore - Clapeyron equation-Clapeyron-Clausius equation- Applications of Clapeyron-Clausius equation.

Third law of thermodynamics: Nernst heat theorem- statement of III law and its applications. Exception to third law- experimental verification of the law-residual entropy-Evaluation of absolute entropy from heat capacity measurements.

Partial molar properties: Partial molar free energy. The concept of chemical potential – variation of chemical potential with T and P- Gibbs Duhem equation- concept of fugacity and activity- activity coefficient- standard states.

UNIT III: CHEMICAL EQUILIBRIUM

Reversible and irreversible reactions-nature of chemical equilibrium-Law of mass action-equilibrium constants- K_p , K_c and K_x Thermodynamic derivations- -Relations between K_p , K_c and K_x - Temperature dependence of equilibrium constant- Van't Hoff isochore-Pressure dependence of equilibrium constant- Heterogenous equilibrium-Le-Chatelier principle-application of Le-Chatelier principle to homogenous equilibrium and physical equilibrium.

UNIT IV : SOLUTIONS

Kinds of solutions -- methods for expressing concentration – Molarity, molality, mole fraction, normality, mass fraction, parts per million -solutions of gases in liquid -Solubility of gases in liquids – Henry's law – statement and limitations.

Solutions of liquid in liquid– Binary liquid mixture - Ideal and non ideal solutions – Raoult's law. - deviation from ideal behavior – pressure – composition and temperature – Composition diagrams for completely miscible binary solutions-Fractional distillation –Azeotropic distillation—nature of azeotropic mixtures-partially miscible liquids—consolute temperature-critical solution temperature-system with upper CST, lower CST and upper and lower CST – Crismer test - Completely immiscible systems-steam distillation.

UNIT V: DILUTE SOLUTIONS

Colligative properties of dilute solutions: relative lowering of vapour pressure, elevation of boiling point, depression of freezing point and osmotic pressure,Ebullioscopic constant-Cryoscopic constant- Relation between colligative properties and Molecular mass –Osmosis-osmotic pressure-laws of osmotic pressure -osmotic pressure and concentration of solute- Experimental methods for determining various colligative properties, degree of dissociation and association of solutes Abnormal molecular mass – Van't Hoff factor.

Reference books

1. Principles of Physical chemistry-Puri,Sharma and Pathania 2004,Vishal Publishing Co., NewDelhi.
- 2 Text book of Physical Chemistry, P.L. Soni, O.P. Dharmarha& U.N. Dash, , 22ndEdn., Sultan Chand & Sons, New Delhi
- 3 Essentials of Physical Chemistry –B.S.Bahl,ArunBahl,G.D.Tuli,Reprint 2006,S.Chand

& Company Ltd., New Delhi-110055.

4. Atkin's Physical Chemistry, 9th Ed, Peter Atkins & Julio de Paula.

5. Thermodynamics for students of Chemistry-Rajaram and Kuriacose

6. Thermodynamics for Chemists –Samuel Glasstone.

7. A Text book of Physical Chemistry-A.S.Negi S.C Anand 2nd Edition-2007.

Model Question paper

Semester III

PHYSICAL CHEMISTRY -II

Time: Three hours

Maximum : 75 marks

Part A - (10 x 1 = 10 marks)

Answer ALL questions

Choose the Correct Answer

- The driving force of chemical reaction is most closely related to the concept of
a. Heat of reaction b. Entropy c. Heat of formation d. Free energy
- The term chemical potential was first introduced by
a. Gibbs b. Duhem c. Einstein d. Maxwell
- Van't Hoff reaction isotherm is
a. $\Delta G = RT \ln K_p$ b. $\Delta G = -RT \ln k_p$ c. $\Delta G = RT \ln K$ d. $\Delta G = RT \ln k_c$
- For a reversible reaction at equilibrium
a) $\Delta G = 0$ b. $\Delta G = \Delta H$ c. $\Delta G > 0$ d. $\Delta G < 0$
- According to Le-Chatelier principle, temperature favours the following reaction
a. Endothermic b. Exothermic c. Both d. None of these
- At equilibrium, K_p is
a. Positive b. Negative c. Zero d. Unity
- Solutions which distill without change in composition and temperature are called
a. Amorphous b. Azeotrope c. Ideal d. Supersaturated

8. The liquid pair which obeys Raoult's law is
- a. HCl-H₂O b. Benzene-toluene c. Ethanol-water d. None of these
9. Colligative properties depend upon
- a. Number of particles of the solute b. Nature of particles of the solute
c. Number of particles of the solvent d. Nature of particles of the solvent.
10. In the osmotic pressure method, the molecular weight of polymers can be calculated from the intercept of
- a. π versus C graph c. π/C versus C graph
b. π/C versus RT/M graph d. π/C versus 1/M graph

Part B - (5 x 5 = 25 marks)

Answer all the 11.a. questions, choosing either (a) or (b)

11.a. Differentiate Gibbs free energy from Helmholtz work function.

Or

b. State the second law of thermodynamics in four different forms.

12.a. Explain partial molar properties.

Or

b. Derive Gibbs-Duhem equation.

13.a. Define K_C and K_P . What is the relation between K_C and K_P ?

Or

b. State and explain the law of mass action.

14.a. What is meant by C.S.T? Explain phenol-water system.

Or

b. State Raoult's law of ideal solutions. What are the characteristics of an ideal solution?.

15.a. What is Van't Hoff factor? Mention its significance.

Or

b. State the laws of osmotic pressure.

PartC - (5 x 8 = 40 marks)

Answer all the questions choosing either (a) or (b)

16. a. Derive Gibbs-Helmholtz equation and write its uses.

Or

b. Explain the concept of entropy and derive the expression for entropy change during isothermal process and reversible process.

17. a. State the third law of thermodynamics. Explain the experimental determination of absolute entropy of a gas at room temperature.

Or

b. Derive Clausius – Clapeyron equation and write its applications.

18. a. State and explain Le Chatelier principle taking a suitable example

Or

b. Derive thermodynamically the law of mass action.

19. a. Explain fractional distillation with suitable example

Or

b. Write notes on azeotropic distillation

20. a. Derive thermodynamically the relation between depression of freezing point and concentration of a dilute solution.

Or

b. How is molecular weight of a non-volatile substance determined by boiling point elevation method?

SEMESTER III
SKILL BASED COURSE-AGROCHEMISTRY

UNIT – I

Fertilizers : Classification, macronutrients -role of nitrogen, potassium and phosphorus on plant growth – manufacture of urea, muriate potash and triple superphosphate. Complex fertilizers, mixed fertilizers & biofertilizers – their composition. Micronutrients – their role in plants.

Manures : Bulky organic manures – Farm yard manure- -oil cakes- blood meal – fish manures- Composting process – handling and storage

UNIT – II

Pesticides – Definition- Classification of Pesticides based on the use and chemical composition– examples -general methods of application –Benefits of pesticides-Potential hazards. Safety measures -first aid.

Insecticides : Plant products – Nicotine, pyrethrin – Inorganic pesticides – borates. Organic pesticides – D.D.T. and BHC.

Fungicide : Sulphur compounds, Copper compounds, Bordeaux mixture.

Herbicides : Acaricides – Rodenticides. Attractants – Repellants.

UNIT –III

Soil: Origin of soil- definition of soil-rock system-weathering of rocks and minerals- main components of soil-organic, inorganic constituents-soil formation-factors favouring soil formation.

UNIT –IV

Characteristics of soil: Physical aspects-soil texture- pore space-bulk density, particle density-soil colour-surface area-soil colloids-plasticity, shrinkage-flocculation and deflocculation, soil air, soil temperature and their importance in plant growth.

Acid, alkaline and saline soils-diagnosis- Methods of reclamation and after care.

UNIT –V

Soil testing: concept and objectives – soil sampling , tools, collection,processing, dispatch of soil sample.

Estimation of total organic compound, available nitrogen and phosphorus in the soil sample.

Determination of pH, EC, moisture content, bulk density and particle density of the soil sample.

Reference books:

- 1.A text book of Soil Science – Daji.A, Asia Publishing House, Madras 1970.
2. Textbook of soil Chemical Analysis – Hesse,P.R.A John Murray Newyork,1971
3. Textbook of Soil Science -Biswas,T.D and Mukherjee,S.K.Second edition, Tata McGraw-Hill Education
- 4.Chemistry for Agriculture and Ecology-Y.MidoM.Satake, Discovery Publishing House.
- 5.Soil Fertility &Fertilisers – Samuel L.Tisdale,WernerL.Nelson, James D.Beaton,John L. Havlin.Fifth edition, Macmillan
6. Nature and properties of soils-Harry, O Buckman N Yle C. Brandy, Macmillan
7. Insecticides, Pesticides and Agro based Industries –R.C.Paliwal, K.Goel, R.K.Gupta, Small Business Publications

SEMESTER III

SKILL BASED COURSE - FOOD CHEMISTRY

Objectives:

To acquire the basic knowledge of food chemistry

UNIT - I CONSTITUTION OF FOOD

Food - definition - classification of food - energy requirements of individuals - source, classification and function of carbohydrates, proteins, lipids, vitamins and minerals - calorific values of food - rice, wheat, milk, fish, vegetables, fruits and cereals.

UNIT - II FOOD ADDITIVES AND PRESERVATIVES

Food additives: Definition - permitted food additives, characteristics and their role: antioxidants, stabilizers, flavours, sweeteners, emulsifiers, thickeners, foodcolourants.

Preservatives: Definition – methods of food preservation - heat, cold, deep-freezing, radiation.

UNIT - III FOOD ADULTERATIONS

Definition - adulterant, adulteration - types of adulterants - common adulterants and their determination in milk, oils, ghee, honey, chilly powder, coriander powder, turmeric powder, coffee powder, tea dust, asafoetida - food poisoning and its prevention – Prevention of Food Adulteration Act- food laboratories and their functions.

UNIT - IV QUALITY STANDARDS

Quality control - specification and standards - FA, FDA, WHO standards - ISI specifications, packing and labeling of foods - Essential Commodities Act, Consumer Protection Act - AGMARK.

UNIT - V LABORATORY WORK

1. Determination of fat, protein and carbohydrate in food stuff.
2. Analysis of fats and oils - iodine value, acid value and RM value.
3. Estimation of glucose by Bertranel method
4. Analysis of starch in foods
5. Isolation of casein from milk

Reference books:

1. Sivasankar B, Food Processing and Preservation, Prentice Hall of India Pvt. Ltd, New Delhi, 2002.
2. Swaminathan M. Textbook on Food Chemistry, Printing and Publishing Co, Ltd, Bangalore 1993.
3. N. S. Gnanaprakasam, G. Ramamurthy, Organic Chemistry, Lab Manual, S. Viswanathan Printers and Publishers Ltd.
4. Food Science – III Edition – B. Sri Lakshmi, New Age International Publisher, 2005.
5. Fundamentals of Foods and Nutrition – Mudambi. R. Sumathi, and Rajagopal, M.V. Willey Eastern Ltd, Madras.

SEMESTER III NON-MAJOR ELECTIVE FOOD CHEMISTRY**Objectives:**

To acquire the basic knowledge of food chemistry

UNIT – I INTRODUCTION

Food : sources and classification – food as a source of energy - functions and biological importance of carbohydrates, protein, fat, vitamins and minerals - calorific value of food – energy requirements of individuals - balanced diet.

UNIT - II FOOD ADDITIVES

Definition, food colourants : natural and artificial - antioxidants, stabilizers, flavours, bleaching and maturing agents – leavening agents.

UNIT - III FOOD PRESERVATIVES

Definition - classification - methods of food preservation and processing by heat, cold, radiation, drying and deep freezing.

UNIT - IV FOOD ADULTERATION

Definition – types – detection and analysis of adulterants in foods: milk, chilli powder, coffee powder, turmeric powder, ghee, oil and pulses.

UNIT -V QUALITY STANDARDS

Quality control - specification and standards - FA, WHO standards – packing and labeling of foods, Essential Commodities Act - Consumer Protection Act - AGMARK.

Reference books:

1. Sivasankar B, Food Processing and Preservation, Prentice Hall of India Pvt. Ltd, New Delhi, 2002.
2. Swaminathan M. Textbook on Food Chemistry, Printing and Publishing Co, Ltd, Bangalore 1993.
3. Food Science – III Edition – Sri Lakshmi B, New Age International Publisher, 2005.
4. Fundamentals of Foods and Nutrition – Mudambi. R. Sumathi, and Rajagopal, M.V. - Willey Eastern Ltd, Madras.

SEMESTER III

NON-MAJOR ELECTIVE WATER MANAGEMENT

Objectives:

To realize the importance of quality water in day to day life

UNIT I - WATER POLLUTION

Definition-sources of water pollution-types of water pollutants: sewage and domestic wastes, industrial effluents, agricultural discharges, detergents, disease causing agents and radioactive materials. Eutrophication and its effects.

UNIT II - WATER QUALITY PARAMETERS

Physical, chemical and biological water quality parameters-water quality standards for drinking water –BIS and WHO. Determination of pH, Total hardness, DO, BOD and COD.

UNIT III - WATER PURIFICATION

Purification of water for drinking purposes: Sedimentation, filtration and disinfection-Desalination: reverse osmosis-Purification of water for industrial purposes: water softening-permutit process and ion-exchange process.

UNIT IV - WASTE WATER TREATMENT

Elementary ideas of waste water treatment: pre-treatment-primary treatment-secondary treatment: aerobic and anaerobic processes –tertiary treatment: evaporation adsorption –chemical precipitation.

UNIT V - RESTORATION AND MANAGEMENT

Importance of lakes and rivers-stresses on the Indian rivers and their effects –A restoration case study: Ganga Action Plan: objectives implementation and drawbacks. Rain water harvesting – water recycling- The water Prevention and control of Pollution Act 1974.

Referencebooks :

1. A. K. De, Environmental Chemistry, Wiley Eastern Ltd., New Delhi.
2. B. K. Sharma, Environmental Chemistry, Goel Publishing House, Meerut.
3. R. K. Trivedy and P. K. Goel, Chemical and biological methods for water pollution studies, Environmental Publications, Karad, India.
4. BIS 1991, Specification for drinking water, Bureau of Indian Standards, New Delhi
5. WHO 1992, International standards for drinking water, World Health Organisation, Geneva.

SEMESTER IV

ORGANIC CHEMISTRY -II

UNIT-1 ALDEHYDES AND KETONES

Structure and reactivity of carbonyl group – relative reactivities of aldehydes and ketones – mechanism of nucleophilic addition reaction (HCN, NaHSO₃, Grignard reagent) – mechanism of aldol condensation, crossed aldol condensation, Knoevenagal reaction, Reformatsky reaction.

Study of the following reactions – Wolff-Kishner reduction, Wittig reaction, Meerwein-Ponndorf-Verley reduction.

Preparation, properties and uses of chloral, acrolein, crotonaldehyde and succinaldehyde.

UNIT-II CARBOXYLIC ACIDS & ACID DERIVATIVES

Structure of carboxylic acid and carboxylate anion – relative strengths of monocarboxylic acids – effect of substituents on acidity – Hell – Volhard – Zelinsky reaction – action of heat on hydroxy acids – preparation, properties and uses of lactic acid and citric acid – dicarboxylic acids: action of heat on dicarboxylic acids – preparation, properties and uses of oxalic acid and succinic acid

Acid anhydrides – Amides – Preparation, properties and structure of urea – Esters – mechanism of esterification and ester hydrolysis.

UNIT – III ALIPHATIC NITROGEN COMPOUNDS

General methods of preparation of primary, secondary and tertiary amines – General Properties – Isomerism – Stereochemistry – basic character of amines – Distinction between primary, Secondary and tertiary amines. Preparation and properties of quaternary ammonium compounds.

Preparation and reactions of diazo methane and diazoacetic ester

UNIT –IV REACTIVE METHYLENE COMPOUNDS & TAUTOMERISM

Reactivity of methylene groups – preparation and synthetic uses of diethyl malonate, ethyl acetoacetate and ethyl cyanoacetate.

Tautomerism – definition – various types, keto – enol, amido – imido, nitro – acinitro and oxime – nitrosotautomerism.

UNIT - V ALICYCLIC COMPOUNDS

Nomenclature – general methods of preparation – spectroscopic properties – chemical properties – relative stabilities of cyclo alkanes – Baeyer's strain theory – Sachse-Mohr theory – Coulson and Moffit's concept – conformations of cyclohexane and monosubstituted cyclohexanes – largering compounds – synthesis and structure of civetone and muscone (structure elucidation not necessary).

Reference books:

1. K.S. Tewari, N.K. Vishil, S.N. Mehotra – A text book of org. chem – 1st edition, Vikas Publishing House Pvt Ltd., 2001, New Delhi.
2. P.L. Soni, Text Book of Organic chemistry, Sultans chand, 1991, New Delhi,
3. Bahl and ArunBahl, Organic Chemistry, S. Chand and Sons, New Delhi, 2005.
4. M.K. Jain and S. C. Sharma, Modern Organic Chemistry
5. Organic Chemistry - R.T.Morrison and Boyd - Prentice Hall
6. Advanced General Organic Chemistry - SachinK.Ghosh - Books and Allied (P) Ltd
7. Organic Chemistry – Bhupinder Mehta and Manju Mehta - PHI Learning P Ltd.

Model Question paper

Semester IV

Organic Chemistry**Time: Three hours****Maximum : 75 marks****PartA - (10 x 1 = 10 marks)****Answer ALL questions****Choose the Correct Answer**

1. Carbonyl groups of aldehydes and ketones readily undergo
 - a. electrophilic substitution
 - b. nucleophilic substitution
 - c. electrophilic addition
 - d. nucleophilic addition
2. Which of the following does not have alpha hydrogen?
 - a. formaldehyde
 - b. acetaldehyde
 - c. acetone
 - d. all of these
3. Malonic acid on heating gives
 - a. formic acid
 - b. acetic acid
 - c. formaldehyde
 - d. oxalic acid
4. Which of the following is least acidic?
 - a. acetic acid
 - b. propionic acid
 - c. butanoic acid
 - d. fluoroacetic acid
5. The isomerism exhibited by diethylamine and methylpropylamine is
 - a. chain isomerism
 - b. position isomerism
 - c. functional isomerism
 - d. metamerism
6. Which of the following is more basic?
 - a. ammonia
 - b. methylamine
 - c. diethylamine
 - d. triethylamine

7. The type of tautomerism exhibited by RCONH_2 and RC(OH)=NH is
a. keto-enol b. amido-imido c. nitro-acinitro d. oxime-nitroso
8. Malonic ester can be used to prepare
a. carboxylic acids b. ketoacids c. aminoacids d. all of these
9. Least stable cycloalkane is
a. cyclopropane b. cyclobutane c. cyclopentane d. cyclohexane
10. The number of bands in the NMR spectrum of cyclohexane is
a. 1 b. 2 c. 6 d. 12

Part B - (5 x 5 = 25 marks)

Answer all the questions, choosing either (a) or (b)

11. a. Give the mechanism of addition of HCN to carbonyl group.

Or

b. Write notes on Wolff Kishner reduction and MPV reduction

12. a. Explain Hell-Volhard-Zelinsky reaction with mechanism.

Or

b. Discuss the structure of urea.

13. a. Discuss the basic nature of amines with suitable example.

Or

b. Give the properties of quaternary compounds .

14. a. Methylenehydrogens in active methylene compounds are more reactive. Discuss

Or

b. Explain keto-enol tautomerism with suitable example.

15. a. Write any two methods of preparation of cycloalkanes.

Or

b. Explain Baeyer's Strain Theory.

Part C - (5 x 8 = 40 marks)

Answer all the questions choosing either (a) or (b)

16. a. Explain the following.

i. Knoevenagal reaction

ii. Wittig reaction

Or

b. Explain the preparation, properties and uses of

i. acrolein ii. crotonaldehyde

17. a. Explain the preparation, properties and uses of citric acid.

Or

b. Explain the following.

i. Mechanism of ester hydrolysis

ii. Action of heat on dicarboxylic acid.

18. a. Write the general methods of preparation of primary, secondary and tertiary amines.

Or

b. Discuss the reactions of diazomethane.

19. a. Give the synthetic applications of malonic ester.

Or

b. Effect the following conversions

i. acetoacetic ester to 4-methyl uracil

ii. acetoacetic ester to antipyrine

iii. ethylcyanoacetate to crotonic acid

iv. ethylcyanoacetate to adipic acid

20. a. Explain the following

i. Sachse – Mohr theory

ii. Coulson and Moffit's concept.

Or

b. Discuss the stability cyclohexane using conformational analysis

SEMESTER – I V

SKILL BASED SUBJECT - CHROMATOGRAPHY

Objective

To understand the principle behind various types of chromatographic techniques and their applications

UNIT 1- CHROMATOGRAPHY

Introduction, Classification of chromatography methods.

Column Chromatography -Principles, experimental procedures, stationary and mobile phases, Choice of solvent systems.Separation technique.Applications.

UNIT II - PAPER CHROMATOGRAPHY

Principles, R_f values, factors affecting R_f values. Experimental procedures, choice of paper and solvent systems, developments of chromatogram.Detection of the spots.Ascending, descending and radialPaper Chromatography Two dimensional chromatography.Applications.

UNIT III - THIN LAYER CHROMATOGRAPHY

Advantages of thin layer chromatography - principles, factors affecting R_f values. Experimental procedures.Choice of adsorbents and solvents.Preparation of plates.Development of the chromatogram.Detection of the spots.Applications.

UNIT IV -ION EXCHANGE CHROMATOGRAPHY

Principle, ion exchange resins & their types- cation exchange resins, anion exchange resins, ion exchange reactions, ion exchange equilibria properties of ion exchange resins, ion exchange capacity, Techniques- applications.

UNIT V -HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Introduction, Instrumentation, Stationary and Mobile phases. . Mobile Phase - Composition.Buffer Composition, pH Selection .Column – preparation-cleaning – regeneration- Storage Conditions.Retention time, Structural factors which govern rate of elution of drugs from HPLC columns.Types of HPLC. Application of HPLC to the quantitative analysis of drugs in formulations

Reference books:

1. B. FRIED, J. SHERMA: Thin-Layer Chromatography, Fourth Edition, revised and expanded, Marcel Dekker Inc.,New York - Basel
2. Scott, R. P. W. Techniques and Practices of Chromatography; 2nd ed. Marcel Dekker Inc., New York

3. Hinshaw, J. V. Etre, L. S. Introduction to Open Tubular Column Gas Chromatography; Advanstar
4. Poole, C. F. Poole, S. K. Chromatography Today; Elsevier, 1991.
5. HPLC: Analytical Chemistry by Open Learning John Wiley & Sons, New York, (1991).

SEMESTER--IV

SKILL BASED SUBJECT - DAIRY CHEMISTRY

Objectives:

- i. To learn the composition and properties of milk
- ii. To understand the chemical composition of milk and milk processing.
- iii. To know the chemistry of cream and butter
- iv. To study to fermented milk products
- v. To know the condensed milk and dairy detergents

UNIT-I PROPERTIES OF MILK

Definition, Composition, Milk lipids, Milk proteins, vitamins and minerals. Factors affecting the composition of milk - adulterants, preservatives, and neutralizer - examples and their detection.

UNIT-II PROCESSING OF MILK

Destruction of microorganisms in milk – physicochemical changes during processing – boiling, pasteurization – pasteurization types – bottle pasteurization –batch pasteurization – HTST (High Temperature Short Time) – vacuum pasteurization –(UHT) Ultra High Temperature Pasteurisation.

UNIT-III MILK PRODUCTS-I

Milk Products: Cream - definition, classification – manufacturing - chemistry of creaming process - physico–chemical properties – separation of cream , estimation of fat in cream , Butter - definition, classification, composition, theory of churning, desibutter, salted butter. Ghee - major constituents, common adulterants and their detection.

UNIT-IV MILK PRODUCTS-II

Fermented milk products - fermentation of milk - definition and conditions. Ice creams - definition, composition, types, manufacture of ice - cream, stabilizers, emulsifiers, and their role, milk powder - definition, process of making milk powder.

UNIT -V CONDENSED MILK AND DAIRY DETERGENTS

Condensed milk – definition, classification and differences between condensed milk and skim – condensed milk – sanitation - pasteurization – nutritive value of milk – difference between cow milk and bauffalo milk- milk enzymes. DairyDetergents : Definition-characteristics-classification-washing procedure (modern method) sterilization-chloramin-T and hypochlorite solution.

Referencebooks :

1. Applied Chemistry-K.BagavathiSundariMJP Publishers Chennai. 2006.
2. Principles of dairy technology - Robert Jenness, Wiley, New York
3. Indian Dairy Products - Rangappa and Acharya, K.T. Asia Publishing House, Bombay, India.
4. Fundamentals of Dairy chemistry - Wond. F.P.Springer.
5. Outlines of Dairy Technology - Sukumar De. – Oxford University Press.
6. Applied chemistry for home science & allied science - T.Jacob, Mcmillan.

SEMESTER IV NON-MAJOR ELECTIVE APPLIED CHEMISTRY

Objectives:

To acquire knowledge about the chemicals used in day to day life

UNIT I - SOAPS AND DETERGENTS

Soaps: Definition-classification-raw materials used in the manufacture of soap –manufacture of toilet soap.

Detergents: Definition –various types with examples- advantages of detergents over soaps – cleansing action of soap.

\UNIT II- FERTILIZERS

Definition-characteristics of a good fertilizer- role of nitrogen, potassium and phosphorous in plant growth – natural fertilizers- chemical fertilizers: urea, muriate of potash and triple superphosphate - mixed fertilizers - biofertilizers – advantages of biofertilizers.

UNIT III - POLYMERS

Fibers: Classification –uses of terylene, nylon and orlon.

Resins: Natural resins- synthetic resins-type-uses of fevicol, quick fix, araldite, glyptal and Bakelite.

Plastics: classification- differences between thermoplasts and thermosets. Advantages of plastics- uses of polythene, PVC, polystyrene, Teflon and thermocole.

Rubber: Types-defects in natural rubber-vulcanization-synthetic rubbers- uses of neoprene, thiocol, butyl rubber, silicone rubber and foam rubber.

UNIT IV- CHEMICALS IN PHARMACY

Definition and therapeutic uses of the following (an elementary study only)

Antiseptics: alum, boric acid

Mouth washes: Hydrogen peroxide

Antacids: Aluminium hydroxide

Analgesics: Aspirin, paracetamol

Antibiotics: Penicillins, tetracyclines

Haematinics: Ferrous fumarate, ferrous gluconate

Laxatives: Epsom salt, milk of magnesia

Sedatives: Diazepam

UNIT V - CHEMICALS IN DAY-TO-DAY LIFE

An outline of the preparation and uses of the following articles.

Tooth powder, tooth paste, writing inks, gum paste, boot polish, talcum powder, chalk crayons, agar battis, phenyl and moth balls.

Reference books:

1. B. K. Sharma, Industrial Chemistry, Goel Publishing House, Meerut.
2. Jeyashree Gosh, A text book of Pharmaceutical Chemistry, S. Chand and Company, NewDelhi.
3. B. N. Chakrabarty, Industrial Chemistry, Oxford and IBH Publishing Co. Pvt.Ltd., Calcutta.

SEMESTER IV**NON-MAJOR ELECTIVE - CLINICAL CHEMISTRY****Objectives**

To know about the safety in laboratory

To know basic first aids

To acquire skill in biochemical analysis

UNIT I

Safety in laboratory-importance-safety equipments-personal protection-dangers to avoid chemical hazards-corrosive, irritants, toxic, flammability and explosive hazards

Physical hazards- fire, pressure and radiation

Biological hazards-micro organisms and animal body fluids

Spillage and waste disposal

UNIT II

First aids for accidents-important rules of first aid

First aid for cuts and abrasions

First aid for bleeding and fractures

First aid for burns, fainting and poisonous bites

First aid box

UNIT III

Blood: Definition-functions and composition-collection of blood through vein puncture and finger prick-Haemolysis agents-precautions.

Anti coagulants – definition, types and quantity used for tests.

Haemotopoiesis -erythropoiesis, leucopoiesis and thrombopoiesis.

UNIT IV

Blood hemoglobin-methods and procedure for hemoglobin test.

Total RBC count-RBC indices-reticulocyte count-normal values-increased and decreased conditions.

Classification of leucocytes-functions-total WBC count-morphology types of WBC-total eosinophil count-normal values- increased and decreased conditions.

Functions of platelet –total platelet count-normal values- increased and decreased conditions.

UNIT V

Blood group system-blood groups-importance, types, antigen and agglutination antigen-antibodies in different groups.

Blood transfusion: detailed blood donor screening procedure-blood collection-anticoagulants in blood bank-storage of donor blood.

Procedures for estimating blood glucose and blood urea.

Reference books:

1. Text Book of Medical Lab Technology – Praful B. Godkar and Darshar P. Godkar, Bhaiyani Publishing House, 2006
2. Clinical Laboratory Methods – Jolm D. Bener, Mosby
3. Clinical Chemistry in Diagnosis and Treatment – Ziwa I. F. P. Peter, Mayne P. D., Year Book Medical Publishers
4. Medical Lab Technology – Ramnik Sood, JPB
5. Practical Clinical Biochemistry – W. H. Heinemann, Verley Publications

PRACTICAL PAPER II

(III & IV SEMESTER)

INORGANIC QUALITATIVE ANALYSIS

Objective

To enable the students to understand various techniques in salt analysis.

Semi micro qualitative analysis of inorganic salt mixtures containing two acid radicals (one should be an interfering radical) and two basic radicals

1. Anions

Simple anions:

Carbonate, nitrate, sulphate, chloride and bromide.

Interfering anions:

Borate, fluoride, oxalate, phosphate and chromate.

2. Cations:

Group I : Lead

Group II : copper, cadmium, bismuth, antimony.

Group III : Aluminium, ferrous iron

Group IV : Cobalt, nickel, manganese, zinc.

Group V : Barium, strontium, calcium

Group VI : Magnesium, ammonium.

Reference books:

1. V.V. Ramanujam, Inorganic Semi Micro Qualitative Analysis, 3rd edition, The National Publishing Company, Chennai, 1974.
2. Vogel's Text Book of Inorganic Qualitative Analysis, 4th edition, ELBS, London, 1974.

SEMESTER – V

ORGANIC CHEMISTRY - PAPER – III

UNIT 1 - STEREOCHEMISTRY

Stereoisomerism - definition - classification into optical and geometrical isomerism. Projection Formulae - Fischer, Flying wedge, Sawhorse and Newman projection formulae - Notation of Optical isomers - D-L notation- Cahn-Ingold-Prelog rules - R-S notations for optical isomers.

Optical isomerism - optical activity - optical and specific rotations - conditions for optical activity - asymmetric centre - chirality - achiral molecules - meaning of (+) and (-). Elements of symmetry - Racemisation - methods of racemisation. Resolution - methods of resolution (mechanical, seeding, biochemical and conversion to diastereoisomers) - Asymmetric synthesis (partial and absolute synthesis).

Optical activity in compounds not containing asymmetric carbon atoms. Biphenyls. Allenes and spiranes.

Geometrical isomerism - cis-trans, syn-anti and E-Z notations - Geometrical isomerism in maleic and fumaric acids and unsymmetrical ketoximes - Methods of distinguishing. Geometrical isomers using melting point, dipole moment, dehydration and cyclisation.

UNIT II - AROMATIC SUBSTITUTION

General mechanism of electrophilic substitution, mechanism of halogenation, nitration, sulphonation, Friedel Craft's alkylation and acylation. Orientation of aromatic substitution – Definition of *ortho*, *para* and *meta* directing groups. Ring activating and deactivating groups with examples – Electronic interpretation of ortho, meta and para directing groups - various groups like NO₂ and Phenolic- Orientation – Korner's absolute method, dipole moment method – direct influence of substituents – rules of orientation- Aromatic Nucleophilic substitutions- unimolecular, bimolecular and benzyne mechanisms- homolytic aromatic substitution (side chain halogenation of alkyl benzenes.).

UNIT III - POLYNUCLEAR HYDROCARBONS

Isolated systems

Preparation of diphenyl, diphenyl methane, triphenyl methane and stilbene.

Condensed systems

Synthesis, reactions, structure and uses of naphthalene. Preparation and reactions of naphthols, naphthylamine and naphthaquinone.

Synthesis, Reactions, structure and uses of anthracene – Preparation and reactions of anthraquinone.

Synthesis and structure of alizarin.

Synthesis. reaction and structure of phenanthrene.

UNIT IV - HETEROCYCLIC COMPOUNDS

Preparation, properties and uses of furan, pyrrole & thiophene - aromatic character. Synthesis and reactions of pyridine and piperidine - comparative study of basicity of pyrrole, pyridine and piperidine with amines.

Condensed five and six membered heterocyclics - preparation and reactions of indole, quinoline and isoquinoline - Fischer indole synthesis, Skraup synthesis and Bischer-Napieralski synthesis-Electrophilic substitution reactions.

UNIT V - DYES

Theory of colour and constitution – Witt's chromophore theory - resonance theory, valence bond theory and modern theory.

Dyes - requirements of a dye - Classification - according to structure and method of application.

Preparation, structure and uses of

- (i) Nitro dyes – Picric acid and Naphthol green
- (ii) Azo dyes - Methyl orange and Bismark brown
- (ii) Triphenyl methane dyes - Malachite green and Crystal violet
- (iii) Phthalein dyes - Phenolphthalein
- (iv) Vat dyes - Indigo
- (v) Anthraquinone dyes - Alizarin.

Reference books:

1. Textbook of Organic Chemistry - P.L.Soni - Sultan Chand
2. Advanced organic Chemistry - B.S.Bahl - S. Chand
3. Principles of Organic Chemistry - A.K.Bansal - New Age
4. A Textbook of Organic Chemistry - A.K.Bansal - New Age
5. Organic Chemistry - I.L.Finar - Volume I & II - Addison **Welsey**
6. Organic Chemistry - R.T.Morrison and Boyd - Prentice Hall
7. Stereochemistry of Organic Compounds - D.Nasipuri - New Age
8. Stereochemistry, Conformation and Mechanisms - Kalsi New Age
9. Advanced General Organic Chemistry - Sachin K.Ghosh - Books and Allied (P) Ltd
10. Textbook of Organic Chemistry - P.S.Kalsi – Macmillan
11. Organic Chemistry – Bhupinder Mehta and Manju Mehta - PHI Learning P Ltd.

MODEL QUESTION PAPER
ORGANIC CHEMISTRY - PAPER – III

Semester – V

Time: Three hrs

Maximum Marks: 75

Part – A (10 x 1 = 10 marks)

Answer ALL questions

Choose the correct answer

1. *Cis-trans* isomerism is shown by

- a) But-1-ene b) But-2-ene c) Prop-1-ene d) Isobutene

2. 2,2 -dinitro biphenyls are optically active due to

- a) Asymmetric Carbon atom b) Asymmetric molecule
c) Planarity d) Axis of symmetry

3. The electrophile involved in sulphonation of benzene is

- a) H_2SO_4 b) HSO^+ c) SO_3 d) HSO_4

4. In chlorobenzene, chlorine is

- a) Activating and *o-p* directing b) Activating and *m*-directing
c) Deactivating and *m*-directing d) Deactivating and *o-p* directing

5. Electrophilic substitution takes place in anthracene at position

- (a) C_1 (b) C_2 (c) C_6 (d) C_9 and C_{10}

6. Naphthalene on oxidation with acidic KMnO_4 gives

- (a) phthalic anhydride (b) phthalic acid (c) decaline (d) ketonic acid

7. The reagent used in chichibabin reaction

- (a) Soda amide (b) soda lime (c) sodium hydroxide (d) ammonia

8. Pyrrole undergoes electrophilic substitution at position

- (a) C_3 (b) C_2 (c) both C_2 and C_3 (d) None of these

9. Alizarin is adye

- (a) Azo b) mordant (c) vat (d) nitro

10. A chromophore among the following is

- (a) -OH (b) -NH₂ (c) -C=O (d) -Cl

PART B - (5 x 5 = 25 marks)

Answer ALL questions choosing either (a) or (b)

11. (a) Discuss with suitable example the E,Z system of nomenclature of Geometrical isomers.

OR

(b) Illustrate the following terms with an example (a) Enantiomers (b) Diastereomers

12. (a) How do you explain the m-directing property of NO₂ groups in aromatic electrophilic Substitution?

OR

(b) Explain benzyne mechanism with example

13 (a) Give one method of synthesis of naphthalene?

OR

(b) How will you prepare

- (i) Anthraquinone (ii) tri phenyl methane ?

14 (a) Compare the basic nature of pyrrole and pyridine

OR

(b) Explain the Fischer indole synthesis

15. (a). What are the requirements of dye?

OR

(b) Explain bathochromic shift any hyperchromic shift

PART C - (5 x 8 = 40 marks)

Answer ALL questions choosing either (a) or (b)

16. (a) Write notes on

(i) Asymmetric synthesis (ii) Resolution (iii) Atropisomerism

OR

(b) Explain

(i) Optical isomerism of Biphenyls

(ii) Absolute and relative configuration of organic molecules.

17. (a) Explain the mechanism of Friedel-Craft's alkylation and acylation.

OR

(b) Discuss the mechanism of Aromatic Nucleophilic substitutions

18. (a) How are the following compounds prepared from Naphthalene?

i). Decalin

ii) 2-Acetyl naphthalene

iii). 1,4-Naphthoquinone iv). -Naphthol

OR

(b) Discuss the structure of anthracene

19. (a) Compare the aromatic character of furan, thiophene and pyrrole

OR

(b) Explain i) Bischler-Napieralsky synthesis of isoquinoline.

ii) Scaup synthesis of quinoline.

20. (a) Describe in detail the Witt's theory of colour and constitution

OR

(b) How are the following synthesized?

i) Alizarin

ii) Indigo

SEMESTER – V
PHYSICAL CHEMISTRY – III

Objectives

To understand the kinetics of reactions

To understand the concepts of thermodynamics

To study the principles of electrochemistry and the types of electrochemical cells

To know the terms in phase rule and its application to various systems

UNIT – I CHEMICAL KINETICS

Rate of reaction-Measuring rates of reaction-expressing reaction rates- factors influencing rate- rate constant-Rate laws, Stoichiometry, order and molecularity of reactions- Setting up and solving simple differential equation for first order, second order, third order and zero order reactions. Characteristics of I,II,III and Zero order reactions. Determination of order of reactions. Experimental techniques involved in following kinetics of reaction-Volumetry, manometry, polarimetry and colorimetry, typical examples for each of the techniques. Effect of temperature on rate constant. The activation energy - determination of Arrhenius frequency factor and energy of activation-The collision theory of reaction rates and its limitation. Lindemann theory of unimolecular reactions-The theory of Absolute reaction rates. Comparison of the collision theory with the Absolute reaction rate theory.

UNIT – II IONIC EQUILIBRIA

The Ostwald's dilution law-experimental verification-limitations-acids and bases-Lewis concept-dissociation of weak acids and weak bases-dissociation of water-pH scale-common ion effect- its applications-buffer solution-different types-calculation of pH value of buffer solution. Hydrolysis of salts - salts of weak acids & strong base, salts of weak base and strong acids, salts of weak acid and weak base - determination of degree of hydrolysis. Acid-base indicators- acid-base titration and use of indicators. Solubility product - Application of solubility product principle

UNIT-III ELECTROCHEMISTRY I

Metallic and electrolytic conductance – Definitions of specific, equivalent and molar conductances – Relations between them – measurement of conductance and cell constant. Variation of conductance with dilution – Qualitative explanation– Strong and weak electrolytes. Migration of ions – transport number – determination by Hittorf and moving boundary methods – Kohlrausch's law – applications – calculation of equivalent conductance for weak

electrolytes and determination of transport number. Ionic mobilities and Ionic conductances. Diffusion and ionic mobility- molar ionic conductance and viscosity- Walden rule-Applications of conductance measurements – Degree of dissociation of weak electrolytes – Determination of Ionic product of water – Determination of solubility of sparingly soluble salts – conductometric titrations- Theory of strong electrolytes – Debye – Huckel – Onsager theory- verification of Onsager equation – Wein and Debye –Falkenhagen effect.

UNIT – IV ELECTROCHEMISTRY –II

Galvanic cells – Reversible and Irreversible cells – EMF and its measurement – Weston Standard cell – types of reversible single electrodes – standard Hydrogen electrode – calomel electrode – Derivation of Nernst equation both for emf of cells and single electrode potentials – Nernst theory for single electrode potential –standard reduction potentials – electro chemical series – significance.Application of emf measurements – Application of Gibbs –Helmholtz equation to galvanic cells – calculation of thermodynamic quantities – pH using hydrogen, quinhydrone and glass electrodes – potentiometric titrations. Concentration cells – electrode concentration cells- electrolyte concentration cells- concentration cells with and without transference – LJP expression –polarization – over voltage- decomposition voltage.

UNIT-V PHASE EQUILIBRIA

Phase rule - phase, component, degree of freedom - thermodynamic derivation of phase rule, One-component system: Phase diagrams of Water and sulphur systems.

Two component system: (i) Simple eutectic: Lead-silver system and potassium iodide-water system. (ii) Formation of compound with congruent melting point: Magnesium – zinc system and ferric chloride – water system. Distribution Law-Statement and thermodynamic derivation- association of the solute in one of the solvents- dissociation of the solute in one of the solvents- applications of the distribution law-solvent extraction.

Reference books :

1. B.R. Puri, L.R. Sharma & M.S. Pathania, Principles of Physical Chemistry, Vishal Publishing Co., Jalandhar.
2. P.L. Soni, O.P. Dharmarha & U.N. Dash, Text book of Physical Chemistry, 22ndEdn., Sultan Chand & Sons, New Delhi
3. Essentials of Physical Chemistry– B.S.Bahl, Arun Bahl, G.D.Tuli, Reprint 2006,S.Chand & Company Ltd., New Delhi-110055.

4. Physical Chemistry volumes I & II- S.Pahari, 2004, New Central Book Agency, Kolkotha.
5. Physical Chemistry-G.M.Barrow, 2005, Tata McGraw Hill Publishing Company, New Delhi.
6. Physical Chemistry-G.K.Vemulapalli, 2004, Prentice Hall of India.
7. Chemical Kinetics-K. J. Laidler, Tata McGraw Hill Publishing Company, New Delhi.

SEMESTER – V

ELECTIVE I - POLYMER CHEMISTRY

Objectives:

- To know the concept of polymerization and types of polymers
- To understand the characteristics of polymers
- To acquire knowledge about the polymerization techniques and polymer processing
- To know the chemistry of individual polymers
- To have an idea about the recent advances in polymer sciences

UNIT I - INTRODUCTION TO POLYMERS

Definition - Monomer, polymer and polymerisation - classification of polymers on the basis of (i) origin - Natural, semi synthetic, synthetic,

(ii) Physical properties and applications - Rubbers, plastic, fibres

(iii) Thermal response - thermoplastics, thermosetting

(iv) Structure - Homopolymers (linear, branched, cross link or network), Copolymers (Random, Alternate, Block, Graft)

(v) Crystallinity - non-crystalline (amorphous), semi-crystalline

(vi) Mode of formation - Addition, Condensation Polymerisation (definition and examples only)

(vii) Methods of polymerization - Bulk, Solution, Suspension Polymerisation (definition and examples only)

Chemistry of polymerization: Chain polymerization, free radical, ionic, co-ordination, step polymerization, polyaddition and polycondensation, miscellaneous ring opening and group transfer polymerizations.

UNIT II - CHARACTERISTICS OF POLYMERS

Glass transition temperature (T_g) - definition – Factors affecting T_g – relationships between T_g and molecular weight and melting point. Importance of T_g . Molecular weight of polymers. Number average, weight average (problems), sedimentation and viscosity average molecular weights. Molecular weights and degree of polymerization - chemical reaction - hydrolysis - hydrogenation - addition - substitution – cross-linking, vulcanisation and cyclisation reactions. Polymer degradation - basic idea of thermal, photo and oxidative degradation of polymers.

UNIT III - POLYMERIZATION TECHNIQUES AND PROCESSING

Bulk, solution, suspension, emulsion, melt condensation and interfacial poly condensation polymerizations. polymer processing - calendaring - die-casting, rotational casting - compression moulding - injection moulding - blow moulding - extrusion moulding and reinforcing.

UNIT IV - CHEMISTRY OF SOME COMMERCIAL POLYMERS

Preparation, properties and uses of the following polymers. Thermoplastics, polyethylene, polypropylene, polystyrene, polyacrylonitrile, polyvinyl chloride, nylon, polyester.

Thermosetting plastics: Phenol formaldehyde resin, urea formaldehyde resin, melamine formaldehyde, epoxy resin, polycarbonate.

Elastomers: Natural rubber and synthetic rubber, Styrene and neoprene rubber.

UNIT V - ADVANCES IN POLYMER

Biopolymers - Biomedical polymers - contact lens, dental polymers, artificial heart, kidney, skin and blood cells - High temperature and fire resistant polymers - silicones - conducting polymers - (elementary idea) - polysulphur nitrile, polyphenylene, polypyrrole and polyacetylene. Polymer industry in India.

References books:

1. V.R. Gowarikar, N.V. Viswanathan and J. Sreedhar. Polymer Science, Wiley Eastern, 1995.
2. F.N. Billmeyer, Textbook of Polymer Science, Wiley Interscience, 1971.
3. Material Science II edition, P.K. Palanisamy SCITECH Publications India Pvt., Ltd., Chennai-600001.
4. Engineering Chemistry, V Srinivasan, S.D. Uma Maheshwari, M. Meena. SCITECH Publications India Pvt., Ltd., Chennai-600001.

5. Introduction to Organic Chemistry. John McMurry Brooks/cole Cenage Learning India Private Limited. First Reprint 2008.
6. Modern Chemistry, David. W. Oxtoby, H.P. Gills, Alan Campion Brooks/cole Cenage Learning India Private Limited. First Reprint 2008.

SEMESTER – V

ELECTIVE I - INDUSTRIAL CHEMISTRY

Objectives:

To gain knowledge about systems of units and conversion factor

To understand utilities in chemical industries

To know the severity of corrosion and methods of preventing it

To study the industrial process of silicate industry

To acquire the knowledge about the unit process

UNIT I - UNITS AND DIMENSIONS, MATERIAL BALANCE

Fundamental and derived quantities – System of unit – significance of dimensional analysis – forces – weight – volume – pressure – work – energy – power. Basic chemical calculations: Atomic mass – Molar mass – concept of mole, gmol, comparison of liquid mixtures and gaseous mixtures, percentage of mass, volume and mol – ideal gas laws – Dalton's law, Amagat's law and Henry's law – density and pressure measurements.

Material balance without chemical reaction: Material balance equation – transient and steady state – simple material balance with and without recycle and bypass or chemical engineering operations such as evaporation, drying, filtration, extraction and crystallization.

UNIT II - FUELS AND FURNACES

Fuels – types of fuels – calorific values – ignition point – pyrometric effect – explosives range – Flue gas analysis by Orsat's method – explosives – classifications – low explosives – initiating explosives – high explosives – rocket propellants – nuclear fuels.

Furnaces – types of furnaces – Kilns – Blast furnace, reverberatory furnace – muffle furnace – electric furnace – regenerative furnace, open hearth furnace – Bessemer converter – vertical retort furnace.

UNIT III - CORROSION AND PROTECTIVE COATING

Introduction – severity of corrosion – chemical and electrochemical corrosion – mechanism – factors influencing corrosion – control of corrosion – cathodic and anodic protection.

Paints – characteristics of paint – constituents of paints - pigments – vehicles – thinners – driers – fillers – plasticizers – anti skinning agents – their function and properties.

Metallic coating – removal of surface contamination – removal of superficial corrosion products – polishing – galvanizing – tinning – electroplating.

UNIT IV - SILICATE INDUSTRY

Refractories – requirements of refractories – properties of refractories – solid refractories – fire clay refractories – magnesite refractories, dolomite bricks, graphite refractories, zirconia refractories, silicon carbide.

Abrasives – classifications – natural (diamond, corundum, emery, garnet, quartz and flint) and artificial (carborundum, alundum, boron carbide, metallic abrasives). Uses of abrasives – cement manufacture – setting and hardening of cements – gypsum – plaster of Paris – manufacture – setting and hardening – uses. White wares manufacture – types – glazing.

UNIT V - UNIT PROCESSES IN ORGANIC MANUFACTURE

Sulphonation – uses and applications of sulphonates and sulphates – sulphonating agents – sulphur trioxide – organic complexes – chemical and physical factors in sulphonation – commercial sulphonation of benzene – batch vs continuous sulphonation. Hydrolysis – hydrolyzing agents – mechanism of hydrolysis.

Oxidation – types of oxidation reactions – oxidizing agents – permanganate and dichromate – liquid phase oxidation – vapour phase oxidation – commercial manufacture of acetic acid.

Hydrogenation – catalysts for hydrogenation - hydrogenation of vegetable oils.

Reference books:

1. Industrial Chemistry, B. K. Sharma, Goel Publishing House, Meerut.
2. Industrial Chemistry, B. N. Chakrabarty, Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta.
3. Unit Operations I & II K. A. Gavhane, Nirali Prakashan, Pune.
4. Unit Processes in Organic Synthesis, P. H. Groggins, Tata McGraw-Hill Publishing Company limited, New Delhi.
5. Stoichiometry – B. Z. Bhatt and S. M. Vora.
6. Engineering Chemistry, Jain and Jain.

SEMESTER – V

ELECTIVE II - ANALYTICAL CHEMISTRY

Objective :

To know the importance of analytical chemistry and to study about the different types of analytical techniques

UNIT I - ERRORS AND DATA ANALYSIS

Definition and explanation with examples of the terms – mean, median, mode, range, deviation, mean deviation, relative mean deviation, standard deviation, coefficient of variation and variance – accuracy and precision – types of errors – random and systematic errors – methods of detection and elimination of systematic errors – student's t-test – confidence levels – Q-test for rejection of result – curve fitting – method of least squares – significant figures and computational rules.

UNIT II - WATER ANALYSIS

Sampling and preservation of water samples – physical examination of water : color, odour, turbidity, taste and electrical conductivity – chemical characterisation : pH, acidity, alkalinity, TDS, total, temporary, permanent, calcium and magnesium hardness, chloride, fluoride, BOD, COD, detergents and pesticides – residual chlorine and chlorine demand – Bacteriological examination : total and faecal coliforms.

UNIT III - FUEL ANALYSIS

Solid fuels : coal – classification – proximate analysis : moisture content, ash content, volatile matter and fixed carbon – ultimate analysis : carbon, hydrogen, nitrogen, sulphur and oxygen – heating values – grading of coal – comparison of coal and coke – liquid fuels : flash point, aniline point, octane number and carbon residues – gaseous fuels : producer gas and water gas – calorific values.

UNIT IV - ELECTROANALYTICAL TECHNIQUES

Electrogravimetry : principle, instrumentation and applications. Coulometry : constant current coulometry – coulometric titrations – applications – potentiostatic coulometry – Polarography : principle – experimental assembly – working – advantages and disadvantages of DME – applications to qualitative and quantitative analysis. Amperometric titrations : theory – apparatus – general procedures – applications – advantages.

UNIT V - SPECTROANALYTICAL AND THERMOANALYTICAL METHODS

Spectroanalytical methods : principle, instrumentation and applications of colorimetry, spectrophotometry and fluorimetry – light scattering techniques: nephelometry and turbidimetry.

Thermo analytical methods : principle, instrumentation and applications of TGA and DTA – characteristic features of TGA and DTA curves – factors affecting TGA and DTA curves – simultaneous DTA - TGA curves – thermometric titrations.

Reference books:

- 1) D.A.Skoog, D.M.West and Holler, *Analytical Chemistry : An introduction*, 6th Ed., Saunders College Publishing.
- 2) Gary D. Christian, *Analytical Chemistry*, 6th Ed., John Wiley & Sons.
- 3) S.M.Khopkar, *Environmental Pollution Analysis*, 1st Ed., Wiley Eastern Ltd.,
- 4) APHA, *Standard Methods for Estimation of Water and Waste water*, 19th Ed., American Public Health Association.
- 5) O.P.Vermani and A.K. Narula, *Applied Chemistry*, 2nd Ed., New Age International Publishers.
- 6) A.K.Shaha, *Combustion Engineering and Fuel Technology*, Oxford & IBH Publishing Company.
- 7) D.A.Skoog, Holler and Nieman, *Principles of Instrumental Analysis*, 5th Ed., Saunders College publishing.
- 8) Hobart H.Willard, Lynne L.Merritt, John A.Dean and Frank A. Settle, *Instrumental Methods of Analysis*, 7th Ed., CBS Publishers & Distributors Pvt. Ltd.,

SEMESTER – V

ELECTIVE II - PHARMACEUTICAL CHEMISTRY

Objectives

- i. To understand the concepts and terminologies of pharmaceutical chemistry
- ii. To know the mechanism of action and metabolism of drugs
- iii. To study the functions of various drugs
- iv. To know the important diseases and their treatment
- v. To study the common diseases and important disorders of human beings and the drugs used in the treatment.

UNIT-I IMPORTANT TERMINOLOGIES, CLASSIFICATION AND ASSAY

Important terminologies - pharmacology, molecular pharmacology, pharmacophore , metabolites, antimetabolites, virus, bacteria, fungi, actinomycetes, mutation, pharmacognosy, pharmacotherapeutics, toxicology, chemotherapy – classification of drugs – nomenclature of drugs – nonproprietary names – sources of drugs – assay of drugs (biological, chemical, immunological)

UNIT-II MECHANISMS, METABOLISMS AND MEDICINAL PLANTS

Mechanism of drug action – absorption, drug delivery, drug excretion –Metabolism of drugs –chemical pathways of drug metabolism – phase – I (oxidative, reductive and hydrolytic reactions) and phase - II (conjugate reactions). Physiological effects of different functional groups in drugs –biological role of Na, K, Ca, Cu, Zn and iodine.

Indian medicinal plants – Tulsi, neem, Keezhanelli, adathode, thoothuvalai

UNIT- III DRUGS AND FUNCTIONS

Analgesics- narcotic analgesics- analgesic action, uses and structure activity of morphine. Non-narcotic analgesics –aspirin and paracetamol. Anaesthetics- local anaesthetics – procaine- General anaesthetics- chloroform and halothane. Antibiotics – Therapeutical values of penicillin, tetracyclines, chloramphenicol and streptomycin. Sulpha drugs – sulphanilide, sulphadiazine and cotrimoxazole. Antiseptics and disinfectants – phenols, chloramines and organicmercurials. Antidepressants – barbiturates – mechanism of action and uses. Antipsychotic drugs – piperazine and benzamides.

UNIT-IV DISEASES AND TREATMENT

Composition of blood – blood grouping and matching – Rh factor. Blood pressure – causes, control and treatment- antihypertension drugs- antianginal agents cardiovascular drugs, cardiacglycosides, vasodilators (one example for each). Aneamia – causes and control – antianemic drugs. Diabetes – causes and control – hypoglycemic drugs – insulin – oral hypoglycemic drugs (tolubutamide and chlorpropamide). Cancer- causes and treatment – cobalt therapy - antineoplastic drugs (chlorambucil, methotrexate, plant products and hormones).

UNIT- V COMMON DISEASES AND HEALTH CARE MEDICINES

Common diseases – causes and treatment of insect borne diseases (Malaria and Filariasis), Airborne diseases (Diphtheria, Whooping cough, Influenza, common cold, TB) and Water borne diseases (Cholera, Typhoid and Dysentery). Digestive disorder – Jaundice. Respiratory disorder – Asthma. Nervous system disorder – epilepsy. Other diseases – Leprosy.

Health care medicines – Sources and deficiency diseases of Vitamins A, B complex, C, D, E and K.

Reference books:

1. A text book of pharmaceutical chemistry, Jayashree ghosh, S. Chand, 2003.
2. Pharmaceutical Chemistry by S. Lakshmi, Sultan Chand & Sons, 3rd edition (2004).
3. Medicinal Chemistry, Ashutosh kar, New Age International, 1992
4. Pharmaceutical chemistry – G.R. Chatwal
5. Pharmacology and Pharmatherapeutics – R.S. Satoskar and S.D. Bhandarkar.
6. Drugs, G.L.D. Krupadanam, D.V. Prasad, K.V.Rao, K.L.N.Reddy and C.Sudhakar, Tata McGraw- Hill Publishing Company, New Delhi.
7. Medicinal chemistry, G.R.Chatwal, Himalaya Publishing House, New Delhi (2002)

SEMESTER V

SKILL BASED SUBJECT COMMON PAPER

SEMESTER – VI

INORGANIC CHEMISTRY - PAPER III

Objectives

To study the chemistry of noble gases

To study the theories in coordination chemistry

To study the chemistry of metal carbonyls

To understand the role of metal ions in biological systems

To study the basic principles of photoinorganic chemistry

UNIT - I NOBLE GASES

Occurrence - isolation of noble gases from the atmosphere - separation of the gases from one another - general physical properties - special properties of helium - isotopes of helium - uses of noble gases - importance of inert gases in theoretical chemistry - chemical properties - xenon chemistry: preparation and properties of fluorides, oxides and oxofluorides of xenon - xenates and perxenates - xenon fluoride complexes - structure and bonding in xenon compounds. Fluorides of krypton and radon - hydrates and clathrates of noble gases - uses of clathrate compounds.

UNIT – II CO-ORDINATION CHEMISTRY II

Crystal field theory - splitting of d-orbitals in octahedral and tetrahedral complexes - factors affecting the magnitude of crystal field splitting - effects of crystal field splitting - spectrochemical series - applications of CFT - magnetic properties and spectra of transition metal complexes - crystal field stabilization energy and their uses - limitations of CFT - effective atomic number rule - stability of complexes - step-wise and overall stability constants - factors affecting the stability of complexes - determination of stability constants.

UNIT – III CO-ORDINATION CHEMISTRY III

Labile and inert complexes - ligand substitution reactions in octahedral complexes: aquation, base hydrolysis and anation reactions - substitution reactions in square planar complexes - trans effect - theories of trans effect - mechanism of substitution reactions - redox reactions : inner-sphere and outer-sphere electron transfer reactions - metal carbonyls : 18 electron rule as applied to metal carbonyls - preparation, properties and structure of mono, di and polynuclear carbonyls of Cr, Mn, Fe, Co and Ni - nature of M-L bond in metal carbonyls - metal nitrosyls.

UNIT - IV BIOINORGANIC CHEMISTRY

Role of alkali and alkaline earth metals in biological systems and their transport across the membranes - the effect of excess and deficiency of essential trace metals (Cu, Fe, Co and Zn) - metalloporphyrins - myoglobin and hemoglobin - dioxygen binding - co-operativity in hemoglobin - the Bohr effect - chlorophyll - vitamin B₁₂. Metal complexes of copper, gold and platinum as therapeutic agents - chelation therapy in metal poisoning.

UNIT - V PHOTOINORGANIC CHEMISTRY

Electronic transitions in metal complexes : selection rules - metal-centered and charge-transfer transitions - properties of excited states - bimolecular quenching and energy transfer - photochemical pathways : substitutional, reduction-oxidation and isomerisation processes - photosubstitution reactions of Cr(III) complexes - Adamson's rules - photoredox reactions of Co(III) complexes - photoisomerisation in Pt(II) complexes. Photochemical conversion and storage of solar energy : photolytic cleavage of water into H₂ and O₂ - photoelectrochemical devices : photogalvanic cells and semiconductor based photovoltaic cells.

Reference books :

1. J.D. Lee, *Concise Inorganic Chemistry* 5th Ed., Blackwell Science Ltd.,
2. James E. Huheey, Elien A. Keiter and Richard L. Keiter, *Inorganic Chemistry : Principles Structure and Reactivity*, 4th Ed., Harper College Publisher.
3. F. Albert Cotton, Geoffrey Wilkinson, Carlos A. Marilo and Manfred Bochman, *Advanced Inorganic Chemistry*, 6th Ed., Wiley Interscience Publication.
4. Fred Basolo and Ralph G. Pearson, *Mechanisms of Inorganic Reactions : A study of metal complexes in solution*, 2nd Ed., John wiley and sons, Inc.,
5. David E. Fenton, *Biocoordination Chemistry*, 1st Ed., Oxford Science Publications.
6. Ivano Bertini, Harry B Gray, Stephen J Lippard, Joan Selverstone Valentine, *Bioinorganic Chemistry*, 1st Ed., Viva Books Pvt. Ltd.,
7. J.K. Rohatgi - Mukherjee, *Fundamentals of Photochemistry* - Wiley Eastern Revised Ed.,
8. *Journal of Chemical Education*, Vol.60, No.10, October 1983.
9. A.W. Adamson and P.D. Fleischauer, (Editors) *Concepts of Inorganic photochemistry*, John wiley and sons, New York, 1975.

INORGANIC CHEMISTRY - Paper III

(VI Semester)

Time : 3 Hrs

Maximum : 75 marks

PART - A (10 X 1 = 10 marks)

Answer all questions

Choose the correct answer

- Which one of the following noble gases is the most abundant in atmosphere ?
a) Kr b) Ar c) Ne d) He
- Clathrate compounds formed by noble gases are essentially maintained by
a) covalent bonding b) multiple bonding
c) coordinate bonding d) hydrogen bonding
- Which of the following complex is paramagnetic ?
a) $[\text{Co}(\text{NH}_3)_6]^{3+}$ b) $[\text{Fe}(\text{CN})_6]^{4-}$ c) $[\text{Co}(\text{CN})_6]^{3-}$ d) $[\text{CoF}_6]^{3-}$
- Which of the following is having higher trans effect ?
a) CN^- b) NO_2^- c) NH_3 d) H_2O
- The metal carbonyl which does not obey EAN rule is
a) $\text{V}(\text{CO})_6$ b) $\text{Ni}(\text{CO})_4$ c) $\text{Fe}(\text{CO})_5$ d) $\text{Cr}(\text{CO})_6$
- $\text{Ni}(\text{CO})_4$ is
a) square planer and paramagnetic b) square planer and diamagnetic
c) tetrahedral and diamagnetic d) tetrahedral and paramagnetic
- Siderosis is caused by
a) deficiency of copper b) deficiency of iron

b. Describe the working principle of $\text{Na}^+ - \text{K}^+$ pump in a cell.

15. a. State Adamson's rules. Mention their importance.

(OR)

b. Give an account of the photoredox reaction of Co(III) complexes.

PART - C (5 X 8 = 40 marks)

Answer all questions, choosing either (a) or (b)

16. a. Discuss the preparation and stereochemistry of XeF_6 and XeOF_4

(OR)

b. How are inert gases obtained from liquid air ? What are their industrial uses.

17. a. Describe the splitting of d-orbitals in an octahedral complex.

(OR)

b. Explain the factors that affect the stability of complexes in solutions.

18. a. Discuss the structure of $\text{Co}_2(\text{CO})_8$ and $\text{Mn}(\text{CO})_{10}$

(OR)

b. Briefly discuss the ligand substitution reactions occur in square planar complexes.

19. a. Discuss the application of metal complexes as therapeutic agents.

(OR)

b. Explain the structure and function of chlorophyll in photosynthesis.

20. a. Explain a system for the photochemical conversion of H_2O into O_2 and H_2 .

(OR)

b. Write notes on the following

i) Photosubstitution reactions

ii) Photoelectrochemical cells.

SEMESTER-VI
ORGANIC CHEMISTRY - PAPER IV

Objectives

- i.* To study the structure and functions of aldohexoses and ketohexoses.
- ii.* To learn the chemistry of carbonyl, hydroxy and carboxyl functional groups in aromatic environment
- iii.* To learn and practice the molecular rearrangements and the reaction mechanisms and the role of reagents in organic chemistry
- iv.* To learn the basic aspects of alkaloids and terpenoids
- v.* To learn the basics of organic spectroscopy

UNIT-I CARBOHYDRATES

Classification-Monosaccharides- constitution of glucose and fructose. Reactions of glucose and fructose – Osazone formation, Mutarotation and its mechanism, cyclic structure, pyranose and furanose forms. Epimerisation-Chain lengthening and shortening of aldoses. Interconversions of aldoses and ketoses.

Disaccharides- sucrose- reactions and structure.

Polysaccharides – starch and cellulose (elucidation of structure not necessary).

UNIT-II PHENOLS, AROMATIC ALDEHYDES, KETONES AND ACIDS

Phenols

Acidic character of phenols- effect of substituents on acidity of phenols - Mechanisms of Kolbe's reaction and Reimer-Tiemann reaction. Preparation of cresols, catechol, resorcinol, quinol and eugenol.

Aldehydes and ketones

Preparation and uses of cinnamaldehyde. Coumarin, vanillin, Michler's ketone, p-benzoquinone-Quinone mono oxime tautomerism. Mechanism of Cannizzaro reaction, benzoin condensation, Perkin reaction, Claisen reaction, Knoevenagel reaction, Gattermann aldehyde synthesis and Houben –Hoesch synthesis.

Aromatic acids

Ortho effect, preparation of mandelic acid, cinnamic acid and anthranilic acid. Preparation and uses of benzene-1,2- dicarboxylic acid, benzene-1,3- dicarboxylic acid and 1,4- dicarboxylic acid.

UNIT-III MOLECULAR REARRANGEMENTS AND REAGENTS

Classification as anionotropic, cationotropic, intermolecular and intramolecular.

Mechanisms of pinacol-pinacolone, Beckmann, benzidine, Hofmann, Curtius, Schmidt, benzilic acid, Fries and Cope rearrangements

Important reagents and their applications in organic chemistry – AlCl_3 , BF_3 , LiAlH_4 , NaBH_4 , PCl_5 , P_2O_5 , Na/ethanol , alcoholic KOH , H_2/Ni , $\text{H}_2/\text{Pd-BaSO}_4$, Zn/Hg-HCl , $\text{H}_2\text{N-NH}_2/\text{C}_2\text{H}_5\text{ONa}$, Ag_2O , HIO_4 , Lead tetra acetate and Osmium tetroxide.

UNIT-IV ALKALOIDS AND TERPENOIDS

Alkaloids – classification – isolation – general methods of determination of structure of alkaloids-synthesis and structural elucidation of coniine, piperine and nicotine.

Terpenes- definition,classification-isolation- isoprene rule-synthesis and structural elucidation of citral, geraniol, menthol and dipentene.

UNIT-V ORGANIC SPECTROSCOPY

UV spectroscopy - chromophore – auxochrome – blue shift, red shift –hypochromic shift, hyperchromic shift – applications for studying functional groups,cis-trans isomerism and nature of double bonds- Woodward-Fischer rules as applied to conjugated enes and alpha and beta unsaturated ketones.

IR spectroscopy–characteristics of IR absorption frequencies – intermolecular and intramolecular hydrogen bonding – functional group detection.

NMR Spectroscopy - interpretation of NMR spectra of simple organic compounds such as acetone, anisole, benzaldehyde, isobutene, mesitylene, 1-chloropropane, ethyl methyl ketone, benzyl alcohol, and propionic acid.

Reference Books:

1. K.S. Tewari, N.K. Vishil, S.N. Mehotra – A text book of org. chem – 1st edition, Vikas Publishing House Pvt Ltd., 2001, New Delhi.
2. P.L. Soni, Text Book of Organic chemistry, Sultans Chand, 1991, New Delhi,
3. Bahl and Arun Bahl, Organic Chemistry, S. Chand and Sons, New Delhi, 2005.
4. Gurdeep Chatwal, Reaction mechanisms and reagents in organic chemistry

5. O. P. Agarwal, Chemistry of Organic Natural Products, Vol 1 and 2, Goel Pub. House, 2002.
6. Gurdeep Chatwal, Chemistry of Organic Natural Products, Vol 1 and 2, Goel Pub. House, 2002
7. Y.R. Sharma, O.P. Vig, Elementary organic absorption spectroscopy – 1st edition, Goel Publishers, 1997, Meerut
8. R. T. Morrison and R. N. Boyd, Organic Chemistry, 6th Edition, Printice-Hall Of India Limited, New Delhi, 1992.
9. Jerry March, Advanced Organic Chemistry, 4th Edition, John Wiley and Sons, New York, 1992.
10. S. H. Pine, Organic Chemistry, 5th Edition, McGraw Hill International Edition, Chemistry Series, New York, 1987.

SEMESTER VI

PHYSICAL CHEMISTRY - PAPER IV

Objectives

- To study about the principles in photochemistry
- To understand the principles in advanced spectroscopy
- To study the principles of group theory as applied to simple molecules
- To know the importance of nanochemistry

UNIT - I PHOTO CHEMISTRY

Difference between thermal and photochemical processes, primary and secondary reactions - Laws of photochemistry – Beer Lambert law, Grotthus - Draper law, Stark-Einstein law - Quantum efficiency – experimental determination of quantum yield.

Energy transfer in photochemical reactions – Jablonski diagram - radiative and non radiative transition - internal conversion, intersystem crossing - qualitative description of fluorescence, phosphorescence - chemiluminescence, bioluminescence, thermoluminescence, photosensitization and quenching - photochemical reactions - kinetics of hydrogen-bromine, hydrogen-chlorine reaction and decomposition of HI. Lasers – types and uses..

UNIT - II SPECTROSCOPY I

Introduction - various types of molecular spectra - electronic, vibrational and rotational energy levels - Born-Oppenheimer approximation.

Rotation spectra of diatomic molecules - determination of bond length and moment of inertia from rotational spectra - numerical problems - selection rule, effect of isotopic substitution.

UV-visible spectroscopy: theory - types of transitions in molecules - selection rules for electronic spectra - factors affecting absorption maximum and intensity – applications.

IR spectroscopy : theory - stretching and bending vibrations - factors affecting vibrational frequencies - important spectral regions for the characterization of functional groups - finger print region - determination of force constant - qualitative relation of force constant to bond energies - selection rules - modes of vibrations in polyatomic molecules - vibrational modes of H₂O and CO₂ – applications - numerical problems.

UNIT - III SPECTROSCOPY II

Raman spectroscopy: Principle - Rayleigh and Raman scattering - Stokes and Anti-stokes lines - differences between IR and Raman spectroscopy - mutual exclusion principle – selection rule - applications.

NMR spectroscopy: Theory of NMR, modes of nuclear spin-relaxation process - shielding effect, hyperfine splitting, coupling constants, - chemical shift - factors affecting chemical shift - internal standard, δ and τ scale - applications of NMR and limitations of NMR.

ESR spectroscopy: principle - energy level splitting - presentation of ESR spectrum for methyl and benzene radicals, deuterium - applications

Mass spectroscopy: basic principles of mass spectrum - molecular peak - base peak - isotopic peak - meta stable peak - types of fragmentation - factors influencing the fragmentation - McLafferty rearrangement - applications

UNIT - IV GROUP THEORY

Concept of symmetry in chemistry - symmetry operations and symmetry elements - rotational axis of symmetry and types of rotational axes - planes of symmetry and types of planes - improper rotational axis of symmetry - identity element - groups and their basic properties – Abelian and cyclic groups - classification of molecules into point groups - the symmetry

operations of a molecule form a group - C_{2v} and C_{3v} point groups - group multiplication tables - character tables for C_{2v} and C_{3v} point groups - flow chart for the systematic identification of molecular point group.

UNIT - V NANOCHEMISTRY

Definition - size dependent properties: magnetic, electrical and optical properties – quantum dots – metal oxides and metal nano particles - ceramic nano particles

Synthesis of nanomaterials - bottom-up and top-down approaches - thin film deposition - catalytic assisted growth - chemical vapour deposition - sol gel method - chemical reduction

Fullerenes - carbon nanotubes - single walled and multi walled nano tubes – structures - carbon nanofibre – nanocomposites.

Applications of nanoscience and nanotechnology.

Reference books :

1. Principles of Physical Chemistry - B.R. Puri and Sharma - Shobanlal Nagin Chand & Co.,
2. Text Book of Physical Chemistry - P.L. Soni - Sultan Chand.
3. Elements of physical chemistry - Glasstone and Lewis - Macmillan.
4. Physical chemistry - G.W. Castellan - Narosa publishing house.
5. Universal General Chemistry, C.N.R. Rao, Macmillan.
6. Group theory and its Chemical Applications - P.K.Bhattacharya - Himalaya publishing House.
7. Nano: The Essentials Understanding Nano Science and Nanotechnology. T. Pradeep -. Tata Mc Graw-Hill Publishing Company Ltd. New Dehli.
8. Introduction to Nano technology, Charles P Poole Jr. & Frank J Owens, Wiley Interscience
9. Kemp, W. Organic Spectroscopy
10. Jag Mohan Organic Spectroscopy

SEMESTER- VI
ELECTIVE - BIOCHEMISTRY

Objectives :

1. To enable the student to develop a sound knowledge of fundamental concepts in biochemistry.
2. To enumerate the molecular motif of a living cell, structural and functional hierarchy of biomolecules.
3. To emphasis on the various aspects of metabolism and interrelationship of metabolic events.

UNIT I - AMINO ACIDS AND PROTEINS

Amino acids – classification – Synthesis of amino acids and their identification. Peptide bond-stereochemistry, synthesis of peptides by solution and solid phase techniques.

Proteins – classification – properties-3D structure-determination of amino acid sequence – denaturation and renaturation of protein molecules.

Separation and purification of proteins – dialysis – gel filtration - electrophoresis.

Catabolism of amino acids: Transamination, oxidative deamination, decarboxylation. The urea cycle and other possibilities of detoxification of ammonia.

UNIT II - ENZYMES

Nomenclature, classification and properties-specificity, factors influencing enzyme action. Mechanism of enzyme action – Lock and Key model and induced fit models.

Coenzymes – cofactors – prosthetic groups of enzymes (TPP, NAD, NADP, FAD, ATP).

Their importance in enzyme action. Mechanism of inhibition (competitive, non- and uncompetitive and allosteric). Immobilization of enzymes. Enzyme specificity,

Kinetics of mono and disubstrate enzyme catalyzed reactions. Serum enzymes and isoenzymes-their diagnostic value.

UNIT III - LIPIDS

Classification - neutral lipids, Phospho lipids (lecithines, cephalins, plasmalogens) and glycolipids – importance, synthesis and degradation. Fatty acids – saturated, unsaturated fatty acids, EFA. Properties – Hydrolysis-acid number, saponification number. Auto-oxidation (Rancidity), addition reactions-Iodine value, Polenske number, Reichert-Meissl number, acetyl number. Hydrogenation. Cholesterol – biosynthesis. Bile salts derived from cholesterol.

Metabolism: Oxidation of glycerol – oxidation of fatty acids; biosynthesis of lipids – synthesis of fatty acids and synthesis of triglycerides.

UNIT IV- CARBOHYDRATES

Classification – reducing and non-reducing sugars. Glucose: structure-conformation –Stability. Carbohydrates of the cell membrane – starch, cellulose and glycogen. (Structure and utility)

Metabolism: Glycolysis and its reversal; TCA cycle. Relation between glycolysis and respiration. Principles of bioenergetics, electron transport chain and oxidative phosphorylation. Gluconeogenesis, pentose phosphate pathway.

Unit V - NUCLEIC ACIDS

Nucleosides and nucleotides – purine and pyrimidine bases. Nucleic acids Difference between DNA and RNA. Classification of RNA. Biosynthesis of DNA: Replication. Biosynthesis of mRNA: Transcription. Genetic code – mutations and mutants. DNA repair. Biosynthesis of proteins. DNA sequencing and PCR, recombinant DNA technology, DNA polymorphism.

Reference books :

1. Lehninger, Principles of Biochemistry, Fourth Edition, by David L. Nelson and Michael M. Cox, Worth Publishers, New York, 2005.
2. L. Veerakumari, Biochemistry, MJP publishers, Chennai, 2004.
3. Lubert Stryer, Biochemistry, W. H. Freeman and company, New York, 1975.
4. Robert L. Caret, Katherine J. Denniston, Joseph J. Topping, Principles and Applications of organic and biological chemistry, WBB publishers, USA, 1993.
5. J. L. Jain, Biochemistry, Sultan Chand and Co. 1999
6. A. Mazur and B. Harrow, Text book of biochemistry, 10th Edition, W.B. Saunders Co., Philadelphia, 1971.
7. Paula Yurkanis Bruice, Organic chemistry, 3rd Edition, Pearson Education, Inc. (Singapore), New Delhi, reprint, 2002.
8. P. W. Kuchel and G. B. Ralston, Shaum Series, Theory and Problems of Biochemistry, McGraw-Hill Book Company, New York, 1988.

SEMESTER – VI
ELECTIVE - APPLIED CHEMISTRY

Objectives

- To study the importance of water purification
- To understand the importance of lubricants
- To know about the mineral wealth and its importance
- To know the applications of leather technology
- To study the various types of environmental pollution

UNIT I - WATER TECHNOLOGY

Sources of water: hardness – classification - units and estimation. Water for industries – boiler feed water and its treatment – external conditioning : lime soda, permutit and ion exchange processes – internal conditioning : carbonate, phosphate, calgon and colloidal treatments – Boiler corrosion. Water for domestic purposes – requirements – purification : sedimentation – coagulation – filtration – disinfection : ozonisation – chlorination – break point chlorination . Sea water as a source of drinking water : reverse osmosis and electrodialysis – removal of taste and colour - fluoridation .

UNIT II - LUBRICATING OILS, GREASES AND EMULSIONS

Lubricating oils – classification – mechanism of lubrication : viscosity index, cloud point, flash point, fire point, aniline point, neutralization number, saponification number, iodine value, specific gravity and their determination. Greases : classification – consistency or mechanical stability – penetration number, dropping point and their determination. Emulsions : water emulsion test – steam emulsion number.

UNIT III - ORES AND ALLOYS

Iron ores – Indian iron resources – determination of ferrous ion and total iron by dichrometry and permanganometry – copper ores and brass – estimation of copper – silver ores and alloys – determination of silver – pyrolusite - estimation of available oxygen by iodometric and permanganometric methods – calcium carbonate minerals – amount of calcium in lime stone – Powder metallurgy : production of metal powder – fabrication methods - advantages and applications of powder metallurgy.

UNIT IV - LEATHER CHEMISTRY

Introduction – constituents of animal skin – preparing skins and hides : cleaning and soaking – liming and degreasing – fleshing - shaving – leather tanning : vegetable tanning and chrome or mineral tanning – dyeing and fat liquoring – leather finishing. Leather industries in India – leather products and their uses – Tannery effluents – methods of treatment – primary, secondary and tertiary treatments – waste management – pollution prevention.

UNIT V - ENVIRONMENTAL POLLUTION AND ITS CONTROL

Structure and composition of atmosphere – pollutants – classification – air pollutants and their effects – green house effect and global warming, ozone depletion, photochemical smog and acid rain – removal of particulates and gaseous pollutants – methods and equipments. Water pollutants – classification – effects of water pollution – treatment of domestic wastes and industrial effluents . Soil pollution – sources, causes and control. Noise pollution – sources, effects, measurement and control. Radioactive pollution – sources, effects and control.

Reference books:

- 1) M.A. Neelakantan, T. Jeyakumar, P. Thillai arasu, *Applied Chemistry*, Annai Publishers
- 2) O.P. Vermani and A.K. Narula, *Applied Chemistry*, Reprint 2008, New age international Publishers.
- 3) Dr.M. Karunithi, Dr.N. Ayyaswami, Dr.T. Ramachandran and H. Venkataraman, *Applied Chemistry*, 1st Ed., 1993, Anuradha Agencies.
- 4) K.Bagavathi sundari, *Applied Chemistry*, MJP Publishers.
- 5) Prof.D.N. Dhar, *Applied Chemistry-II*, 1st Ed., 2009, Vayu Education of India.

Practical III GRAVIMETRIC ESTIMATION & INORGANIC PREPARATIONS

Gravimetric Estimation

1. Estimation of lead as lead chromate
2. Estimation of barium as barium chromate
3. Estimation of nickel as nickel dimethylglyoximate
4. Estimation of zinc as zinc oxinate
5. Estimation of copper as copper thiocyanate

Inorganic preparations

1. Preparation of potash alum
2. Preparation of chrome alum
3. Preparation of Prussian blue
4. Preparation of sodium ferrioxalate
5. Preparation of tetrammine copper(II) sulphate
6. Preparation of trithiourea copper(I)chloridedihydrate
7. Preparation of potassium trisoxalato ferrate(III)
8. Preparation of hexathiourea lead(II) nitrate

References

1. Sundaram, Krishnan, Raghavan, Practical Chemistry (Part III), S. Viswanathan Co. Pvt., 1996.
2. Vogel's Text Book of Quantitative Chemical Analysis. 5th Edi., ELBS/Longman England, 1989.
3. O.P. Pandey, D.N Bajpai, S. Gini, Practical Chemistry, for I, II & III BSc. Students. S.Chand & Company Ltd reprint 2009.
4. V.K.Ahluwalia, Sunitha Dhingra, Adarsh Gulate College Practical Chemistry, Universities Press (India) Pvt Ltd 2008 (reprint)

**Practical IV - ORGANIC ANALYSIS, ORGANIC PREPARATION &
DETERMINATION OF PHYSICAL CONSTANTS**

1. Organic analysis

Qualitative analysis of the given organic compound

- a. Test for aliphatic and aromatic nature of substances
- b. Test for saturation and unsaturation
- c. Identification of functional groups (carboxylic acids, phenols, aldehydes, ketones, esters, amines, amides, anilides, nitrocompounds and carbohydrates)
- d. Preparation of solid derivative to confirm the presence of functional group

2. Organic preparation

1. Preparation of salicylic acid from methyl salicylate/ benzoic acid from ethylbenzoate
2. Preparation of benzoic acid from benzamide
3. Preparation of acetyl salicylic acid from salicylic acid/ acetanilide from aniline
4. Preparation of benzoic acid from benzaldehyde
5. Preparation of p-bromoacetanilide from acetanilide
6. Preparation of 2-naphthyl benzoate from 2-naphthol
7. Preparation of picric acid from phenol
8. Preparation of methyl orange from sulphanilic acid

2. Determination of boiling point/ melting point of the given organic compound

References

1. N.S. Gnanapragasam and G. Ramamurthy, Organic Chemistry – Lab manual, S. Viswanathan Co. Pvt., 1998.
2. J.N. Gurthu and R. Kapoor, Advanced Experimental Chemistry (Organic), S. Chand and Co., 1987.
3. B.S. Furniss, A.J. Hannaford, P.W. G. Smith and A.R. Tatchell, Vogel's Text Book of Practical Organic Chemistry. 5th Edn., Pearson Education, 2005.
4. O.P. Pandey, D.N Bajpai, S. Gini, Practical Chemistry, for I, II & III BSc. Students. S.Chand & Company Ltd reprint 2009.
5. P.R.Singh, D.C.Gupta, K.S.Bajpal Experimental Organic Chemistry Vol.I and II, 1980.

Practical V - PHYSICAL CHEMISTRY EXPERIMENTS

1. Determination of molar mass of the given substance by Rast micro/macro method
2. Determination of molecular weight of the given substance by Transition temperature method
3. Determination of solubility of a substance at different temperatures and calculation of heat of solution
4. Study of adsorption of oxalic acid on charcoal and verification of Freundlich isotherm
5. Study of phase equilibrium – Simple eutectic
6. Estimation of HCl by conductometric method using standard oxalic acid (to be prepared) and link NaOH
7. Estimation of MgSO_4 by conductometric method using standard MgSO_4 (to be prepared) and link BaCl_2
8. Estimation of Fe(II) by potentiometric method using standard ferrous ammonium sulphate (to be prepared) and link KMnO_4
9. Estimation of $\text{K}_2\text{Cr}_2\text{O}_7$ by potentiometric method using standard $\text{K}_2\text{Cr}_2\text{O}_7$ (to be prepared) and link KMnO_4
10. Determination of equivalent conductance of weak electrolyte and calculation of dissociation constant
11. Comparison of the strengths of acids by studying the kinetics of ester hydrolysis
12. Determination of CST of phenol-water system. Study of the effect of impurity on CST and determination of the strength of unknown
13. Determination of the viscosity using Oswald viscometer.

References

1. J.N. Gurthu and R. Kapoor, Advanced Experimental Chemistry, S. Chand and Co., 1987.
2. Sundaram, Krishnan, Raghavan, Practical Chemistry (Part II), S. Viswanathan Co. Pvt., 1996.
3. David P. Shoemaker, Carl W. Garland, Joseph W. Nibler, Experiments in Physical Chemistry, 5th Edi., McGraw- Hill Book company, 1989.
4. Alexander Findlay and J.A. Kitcher. Practical Physical Chemistry, Longmans
5. Y.B. Yadav, Practical Physical Chemistry, Goel publishing house

**MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
CHOICE BASED CREDIT SYSTEM (CBCS)
COURSE STRUCTURE FOR B.SC., PLANT BIOLOGY & PLANT
BIOTECHNOLOGY**

(With effect from the Academic Year 2012 – 2013 Onwards)

**CHOICE BASED CREDIT SYSTEM NORMS AND PATTERN AS IMPLEMENTED IN
ALL AFFILIATED COLLEGES FROM THE ACADEMIC YEAR 2012 – 2013.**

1. Objectives

- ★ To impart theoretical and practical skills that underpins the various branches of the Science of Plant Biology and Plant Biotechnology.
- ★ To enable the students to have a thorough understanding and knowledge of different branches of Plant Biology and Plant Biotechnology
- ★ To make the students to develop the ability to think analytically and solve biological problem.
- ★ To create awareness on maintaining ecofriendly sustainable environment.
- ★ To apply the skills and knowledge gained through the subject to face competitive examinations with confidence.

2. Eligibility for Admission

The minimum eligibility conditions for admission to the **B.Sc., degree in Plant Biology and Plant Biotechnology** program are given below.

The candidates for admission into the first semester of the **B.Sc., degree in Plant Biology and Plant Biotechnology** course will be required to have qualified the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Government of Tamilnadu or any other Examinations accepted by the syndicate as equivalent there to in Science subject.

The applicant must have a sufficient background in Plant Biology to complete the degree requirements with reasonable performance.

3. Duration of the Course

The students shall undergo the prescribed course of study for a period of not less than three academic years (Six semesters). The semester contains 90 working days.

4. Scheme of the Course

	Components		Hours	Credits
I Semester				
Part I	Tamil / Other Language	(1 Course)	6	3
Part II	English	(1 Course)	6	3
Part III	Core Subjects (2 Courses)		8	8
	Paper 1. Cell Biology, Anatomy and Microtechniques			
	Paper 2. Algae, Bryophytes and Algal Biotechnology		2	--
	Allied Subject I	(1 Course)	4	4
			2	-
Part IV	Environmental Studies	(1 Course)	2	2
	TOTAL	(6 Courses)	30	20
II Semester				
Part I	Tamil / Other Language	(1 Course)	6	3
Part II	English	(1 Course)	6	3
Part III	Core Subjects (2 Courses)		8	8
	Paper 3. Mycology, Plant Pathology and Lichenology			
	Paper 4. Microbial Biotechnology		2	2
	Allied Subject I	(1 Course)	4	4
			2	2
Part IV	Value Based Education	(1 Course)	2	2
	TOTAL	(6 Courses)	30	24

	Practical Paper 1 : Cell Biology, Anatomy, Microtechniques, Algae, Bryophytes, Algal Biotechnology. Mycology, Plant Pathology, Lichenology and Microbial Biotechnology		
III Semester			
Part I	Tamil / Other Language (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	Core Subjects (Courses) Paper 5. Pteridophytes, Gymnosperms and Paleobotany	4 2	4 --
	Allied Subject II (1 Course)	4 2	4 --
Part IV	Skill Based Subject (1 Course) Floriculture / Organic Farming	4	4
	Non-major Elective (1 Course) Gardening and Garden management / Mushroom and Seaweed culture	2	2
	TOTAL (6 Courses)	30	20
IV Semester			
Part I	Tamil / Other Language (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	Core Subjects (Courses) Paper 6. Developmental Botany and Experimental Embryology	4 2	4 2
	Allied Subject II (1 Course)	4 2	4 2
Part IV	Skill Based Subject (1 Course) Preservation of Fruits & Vegetables / Herbal Biotechnology	4	4
	Non-major Elective (1 Course) Botany for competitive Examinations / Bioresources	2	2
Part V	Extension activity (NCC, NSS, YRC, YWF)		1
	TOTAL (6 Courses)	30	25
	Practical Paper 2 : Pteridophytes, Gymnosperms, Paleobotany, Developmental Botany and Experimental Embryology		

V Semester					
Part I	Core Subjects (2 Courses)	T	P		
	Paper 7. Taxonomy	4	3	8	8
	Paper 8. Biochemistry	4	3	6	
	2 Major Elective				
	Elective I (1 Course)				
	Techniques in Biotechnology / 5		1		
	Forestry			10	10
	Elective II (1 Course)				
	Marine Biotechnology / 5	5	1	2	
	Horticulture & Plant Breeding				
Part IV	Skill Based Subject (1 Course)				
	Effective Communication / Personality Development			4	4
	TOTAL (6 Courses)			30	22
VI Semester					
Part III	Core Subjects (Course)	T	P		
	Paper 9. Plant Physiology	6	3		
	Paper 10. Genetics, Biometrics & Bioinformatics	6	3	12	
	Paper 11. Applied Biotechnology	5	2	5	
				6	12
				2	12
	1 Major Elective				
	Environmental Biotechnology / 5	5	-	5	5
	Computer Applications				
	TOTAL (7 Courses)			30	29
	Practical Paper 3	-	Taxonomy and Elective I & II		
	Practical Paper 4	-	Biochemistry, Genetics & Biometrics		
	Practical paper 5	-	Plant Physiology & Applied Biotechnology		

5. Elective Subject

Two papers will be given in the elective. One subject will be selected.

6. Study Tour

Study hour such as Algal collection trip, visit to biotechnology laboratories / Field trips to observe natural vegetation may be arranged by the department in respective semesters pertaining to the theory syllabus.

7. Extension Program for the Department

Apart from the curriculum, to enrich the skill development of the students following course in their premises are conducted.

Communication Skill through IT

Personality development

Spoken English.

8. Internal Assessment

There is a separate passing minimum for the external and overall components.

Distribution of marks between External and Internal Assessment is

★ For Theory 75 : 25

★ For Practical 60 : 40

Pass minimum of 40% for external and overall components.

Internal Marks for Theory shall be allotted in the following

The average of the best two from three compulsory tests. Each test is of one hour duration	20 Marks
Assignment	05 Marks
TOTAL	25 Marks

Distribution of mark between External & Internal assessment for Skill based elective - 60 :40

The average of the best two from three compulsory tests. Each test is of one hour duration	20 Marks
Assignment / Demonstrations / Project	20 Marks
TOTAL	40 Marks

Internal Marks for Practical shall be allotted in the following manner

Experimental Work	20 Marks
Record	10 Marks
Model Test	10 Marks
TOTAL	40 Marks

SEMESTER – III

PAPER V (CORE SUBJECT): PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY

(4 hrs / Week - 4 Credits)

- Unit – I:** Classification of Pteridophytes (Smith, 1951). Distribution, systematic position, structure, reproduction and life history of the following (need not study the development of gametophyte, sex organs and sporophyte). *Psilotum, Lycopodium*.
- Unit II:** *Selaginella, Marsilea*, Stellar evolution in Pteridophytes Economic importance of pteridophytes.
- Unit III:** Classification of Gymnosperms – Chamberlain (1934), Distribution, systematic position, structure, reproduction and life history of the following: *Pinus*
- Unit IV:** *Gnetum*. (Need not study the development of sex organs and sporophyte). Economic importance of Gymnosperms.

Unit V: Paleobotany: Geological time scale, Methods of Fossilization, Brief study of *Rhynia*, *Lyginopteris* and *Lepidodendron*

Practicals

1. To make suitable micropreparations of types prescribed in the syllabus:

Pteridophytes:

Psilotum stem

Lycopodium stem

Selaginella stem

Marsilea rhizome, Sporocarp – L.S.

Gymnosperms:

Pinus-wood – Transverse section.

Pinus needle – Transverse section.

Gnetum stem – Transverse section.

Gnetum leaf – Transverse section.

To observe and identify specimens and slides

Psilotum – Synangium Longitudinal section

Selaginella-cone – Longitudinal section

Pinus-Male cone – Specimen and slide (Longitudinal section)

Female cone – Specimen and slide (longitudinal section)

Gnetum Male cone – Specimen and longitudinal section of the cone.

Female cone – Specimen and longitudinal section of ovule.

Paleobotany:

Rhynia – Transverse section of the stem.

Lyginopteris – Transverse section of the stem. (Slide or photograph)

Lepidodendron – Transverse section of the stem (Slide or Photograph)

To maintain a record notebook for external evaluation.

References:

1. Arnold, C.R. 1947. An Introduction to Paleobotany. McGraw Hill Co. Ltd., New Delhi.
2. Chamberlain, C.J. 2000. Gymnosperms. CBS Publishers and Distributors, New Delhi.
3. Pandey, S.N. 1995. A textbook of Pteridophyta. Vicas Publishing House, Ghaziabad.
4. Parihar, N.S. 1967. An Introduction to Embryophyta. Vol. II – Pteridophyta. Central Book Depot, Allahabad.
5. Rashid, A. 1976. An Introduction to Embryophytes. Vikas Publishing House, Ghaziabad.
6. Sambamurty, A.V.S.S. 2005. A Textbook of Bryophytes, Pteridophytes, Gymnosperms and Paleobotany. I.K. International Pvt. Ltd., New Delhi.
7. Shukhla, A.C. and Misra, P. 1982. Essentials of Paleobotany. Vikas Publishing House, Pvt. Ltd., Ghaziabad.
8. Singh, V., Pande, P.C. and Jain, D.K. 2002. A Textbook of Botany – Vol. 4. Pteridophyta, Gymnosperms and Paleobotany. Rasooji Publications, Shivaji Road, Meerut – 230 002.
9. Smith, G.M. 1955. Cryptogamic Botany Vol. III. Mc Graw Hill Co. Ltd., New Delhi.
10. Vashista, P.C. 1971. Botany for Degree Students – Gymnosperms. Chand and Co., New Delhi.
11. Vashista, P.C. 1971. Botany for Degree Students – Pteridophytes. Chand and Co., New Delhi.
12. Vashista, P.C., Sinha, A.K. and Anil Kumar. 2006. Botany for Degree Students, Gymnosperms. Chand & Company Ltd., New Delhi.

Model Question paper
Paper V – PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY

Section - A (10 x 1 = 10 Marks)

Answer all the Questions

Choose the Correct Answer

1. Spores of Pteridophytes are
a. haploid b. diploid c. triploid d. polyploid
2. Lycopodium is a commonly called
a. Spike moss b. Club moss c. Water fern d. Quill wort
3. In *Selaginella* the leaves are always
a. homoeophyllus b. heterophyllus c. both (a) and (b) d. macrophyllus
4. Gelatinous ring bearing the sorus are
a. sporophore b. sporocarp c. sori d. sporangium
5. The dwarf shoot of *Pinus* is known as
a. long shoot b. spur shoot c. foliage leaves d. scale leaves
6. Angiosperm like Gymnosperm is
a. *Pinus* b. *Cycas* c. *Gnetum* d. *Cupressus*
7. In *Gnetum* the pollen grains are shed at
a. One celled stage b. 2 celled stage c. 3 celled stage d. 4 celled stage
8. The character which differentiates *Gnetum* from Angiosperm is
a. Xylem with vessels b. Absence of double fertilization c.
Reticulate venation in leaves d. Absence of seeds
9. The vascular stele of *Rhynia* stem is
a. Actinostele b. Haplostele c. Protostele d. Siphonostele
10. *Lyginopteris* was found in the following period.
a. Carboniferous b. Jurassic c. Triassic d. Devonian

Section - B (5 x 5 = 25 Marks)

Answer all questions, choosing either a or b.

11. a. Enumerate the general characteristic features of Pteridophytes.
OR
b. Schematically represent the classification of pteridophytes according to Smith.
12. a. List out the economic importance of Pteridophytes.
OR
b. Briefly explain the internal structure of *Marsilea* sporocarp.
13. a. With neat labelled diagram explain the structure of *Pinus* needle
OR
b. Explain the structure of male gametophyte of *Pinus*.
14. a. What are the various anatomical characters seen in the old stem of *Gnetum*.
OR
b. Trace the differences between Pteridophytes and Gymnosperms.
15. a. Briefly explain the methods of fossilization.
OR
b. Describe the reproductive structure of *Rhynia*.

Section - C (5 x 8 = 40 Marks)

Answer all Questions, Choosing either 'a' or 'b'.

16. a. Give an account of the structure, reproduction and life history of *Lycopodium*.
OR
b. Describe the life history of *Psilotum*.
17. a. Discuss the stellar evolution in Pteridophytes with suitable examples.
OR
b. What is heterospory? Explain with reference to *Selaginella*.
18. a. Explain the classification of Gymnosperms proposed by Chamberlain. Write the characteristic features of each division.
OR
b. Write an essay on the male cone of *Pinus*.
19. a. Describe the structure of the female flower and development of female gametophyte in *Gnetum*.
OR
b. "Gymnosperms are economically important" – Discuss.
20. a. Give an account on Geological time scale.
OR
b. Explain the external and internal morphology of *Lyginopteris*

SKILL BASED SUBJECT

1. FLORICULTURE

(4 hrs/week - 4 Credits)

Unit I

Definition--Commercial floriculture---present position and future scope of Floriculture in India. Cultivation of Rose and Chrysanthemum.

Unit II

Cultivation of Carnation, Tuberose, Anthurium and Orchids.

Unit III

Cutflower production--storage of flowers-harvesting and packing of flowers with special reference to Gerbera, Marigold and Tuberose.

Unit IV

Importance of flowers in perfumery. Extraction of essential oils and its products-Rose and Jasmine oil.

Unit V

Flower arrangement—fresh flowers—types-Western and Japanese, containers, mechanism prolonging the vase life of flowers. Dry decorations—materials, preservation of plant materials, design.

Demonstration and field visits.

1. Flower arrangements – Different styles.
2. Dry flower decorations
3. Field visits to floriculture farms to study the cultivation methods.
4. Visit to the cut flower exporting centres.

Reference

1. Arora, J.S. 2008 Introductory Ornamental Horticulture, Kalyani Publishers.
2. Randhawa, M.S. 1976. Gardening through the Ages. The Macmillan Co. of India Ltd., New Delhi.
3. Kumar, N. 1999. Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
4. Vishnu Swarap, 1997. Garden Flowers. National Book Trust, India, 2005.
5. Manibhushan Rao, 2005 Horticulture. Macmillan India Ltd., New Delhi
6. Edmond, J.B., Senn, T.L., Andrews, F.S. and Halforce, R.G. 1990, Fundamentals of Horticulture, Tala Mc Graw Hill Pvt. Co., London.

SKILL BASED SUBJECT

ORGANIC FARMING (4 hrs/week - 4 credits)

Unit I

Soil Science, Brief account of soil profile. Fertility of soil – importance of organic matter – water retentivity and aeration of soil.

Unit II

Organic manure, Types, Animal wastes – Cattle dung, urine, poultry wastes, slaughter wastes, piggery and fishery wastes.

Unit III

Plant wastes – fallen leaves and twigs – humus formation, Green manuring – mulching – Leaves of trees like *Pongamia*, *Glyricida*, *Azadirachta*, *Calotropis* – Compost making.

Unit IV

Biofertilizers – Rhizobium – importance, mass production and application. VAM fungi mass – production, and applications.

Unit IV

Vermicomposting – Importance, application and production of vermicompost – Importance of Panchagavya foliar spray.

Demonstration

1. Study of Soil profile
2. Measurement of capillarity of different kinds of soil.
3. Identification of the following plants : *Pongamia*, *Glyricidia*, *Azadirachta*, *Calotropis*, *Rhizobium*, *Azolla*.
4. Visit to concerned stations having these practices to study the methods of preparations of biofertilizers / vermicomposts / organic manure.

Reference

1. Dubey, R.C. 2006, A text Book of Biotechnology. S. Chand and Company Ltd., New Delhi.
2. ICAR, 1980. Hand Book of Agriculture, Indian Council of Agricultural Research, New Delhi.
3. John Jothi Prakash, E. 2006. Outlines of Biotechnology. Emkay Publications, New Delhi – 110 005.
4. Mark Coyne. 2004. Soil Microbiology – An Exploratory Approach. Delmar Publishers, Singapore.
5. Miller, C.E. and Turk, L.M. 2002. Fundamentals of Soil Science. Biotech Books, Delhi – 110 035
6. Saha, T.K. 2008. Ecology and Environmental Biology. Books and Allied (P) Ltd., Beliaghata Main Road, Kolkata – 700 010.

SEMESTER III
NON MAJOR ELECTIVE
1. Gardening and Garden Management
(2 hrs/week - 2 credits)

Unit I

Principles of ornamental gardening – Types formal & informal gardens – English gardens, Mogul gardens, Japanese gardens.

Unit II

Culture techniques – Soft wood cutting, simple and Air layering, ‘T’ budding, Approach grafting, Pruning, Garden implements – Digger, Pruning Shears, Garden rake.

Unit III

Components of ornamental gardens – hedges, edges, flower beds, arches, rockery, lawn, topiary.

Unit IV

Vegetable gardening – Types, establishment of Kitchen garden, components of kitchen garden – Perennials, Pandals, fence, seasonal vegetable crops in bunds, compost pits.

Unit V

Indoor gardening – Principles and maintenance. Hanging baskets, Terrarium, Bottle garden, Bonsai.

Demonstration / Visits

1. Cutting, layering, grafting, budding
2. Topiary, Hanging baskets, Terrarium, Bottle garden, Bonsai.
3. Visits to local ornamental gardens.
4. Designing kitchen garden.

Reference

1. Arora, J.S. 2008 Introductory Ornamental Horticulture, Kalyani Publishers.
1. Randhawa, M.S. 1976. Gardening through the Ages. The Macmillan Co. of India Ltd., New Delhi.
2. Kumar, N. 1999. Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
3. Vishnu Swarap, 1997. Garden Flowers. National Book Trust, India, 2005.
4. Manibhushan Rao, 2005 Horticulture. Macmillan India Ltd., New Delhi
5. Edmond, J.B., Senn, T.L., Andrews, F.S. and Halforce, R.G. 1990, Fundamentals of Horticulture, Tala Mc Graw Hill Pvt. Co., London.

NON-MAJOR ELECTIVE

2. MUSHROOM AND SEAWEED CULTURE

(2 hrs/week- 2 Credits)

Unit I

Mushrooms- Introduction, morphology, types of mushrooms, identification of edible and poisonous mushrooms, nutritive values.

Medicinal mushrooms – The thallus and life cycle of an edible mushroom- Oyster mushroom (*Pleurotus* sp.) Prospects of mushroom cultivation in small scale industry.

Unit II

Cultivation of mushrooms- Oyster mushroom (*Pleurotus* sp.) Button mushroom (*Agaricus bisporus*), Paddy straw mushroom (*Volvariella* sp.) Isolation, spawn production, substrates for mushroom cultivation, spawn running and harvesting of mushroom.

Unit III

Post harvest technology of mushrooms, Protection of mushrooms from insect pests, nematodes, mites, viruses, fungal competitors and other diseases. A few recipes of mushrooms.

Unit IV

The marine environment- Physical and chemical properties of sea water, zonation, seaweed resources and distribution. Economically important seaweeds, drugs from marine algae, seaweed as a liquid fertilizer.

Unit V

Seaweed culture in India, Laboratory and mass culture of macro algae- Processing of seaweeds.

Demonstrations :

1. Identification of the edible mushrooms prescribed in the syllabus.
2. Cultivation of paddy straw mushroom.
3. Identification of important seaweeds those are commercially useful.
4. Seaweed cultivation.

References:

1. John Jothi Prakash, E. 2008. Outlines of Biotechnology, Emkay Publications, New Delhi – 1100
2. Kohli, M. S. 1999. Mushrooms – active support essential. The Hindu Survey of Indian
3. Nita Bahl. 2002. Hand book of Mushrooms. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
4. Sohl, H. S. 1988. Mushroom – Exciting Commercial prospects. The Hindu Survey of Indian Agriculture.
5. Tewari, R. P. 2004. Mushroom – Now in the limelight. The Hindu Survey of Indian Agriculture
6. TNAU. 1999. Hand book of Mushroom Cultivation.

SEMESTER IV**Paper: VI - Developmental Botany and Experimental Embryology****(4 hrs/week- 4 Credits)****Unit I**

Organization of a typical flower – structure of anther, Microsporogenesis. Development of male gametophyte.

Unit II

Types of ovules – Detailed structure of orthotropous and anatropous ovule. Megasporogenesis – Development of female gametophyte and embryo sac (Polygonum type only).

Unit III

Fertilization – Post fertilization changes in the flower. Endosperm types – Nuclear, cellular, Helobial and ruminant with examples for each type.

Unit IV

Development and structure of a typical dicot embryo – *Capsella* type, Apomixis, Polyembryony.

Unit V

Study of Anther, Pollen and Embryo culture – Preparation of culture media, culture techniques and applications.

Practicals

1. To dissect out *Tridax* embryo (Any one stage).
2. Spot at sight:
 - a. Transverse section of mature anther (Micro slide).
 - b. Pollen tetrads (Micro slide).
 - c. Longitudinal section of anatropous ovule. ortho
 - d. Ruminant endosperm.
 - e. Longitudinal section of mature embryo (*Capsella*).
 - f. Photographs or diagrams of anther culture / Pollen culture.
 - g. Photographs or diagrams of Pollen culture / embryo culture.
 - h. Microphotograph – Polyembryony.

References

1. Bhojwani, S.S. and Bhatnagar, S.P. 2008. The Embryology of Angiosperms. Vikas Publishing House, Ghaziabad.
2. Gupta, S.K. 1988. Embryology of Angiosperms. K. Nath and Co., Near Kotwali, Meetur – 250 002.
3. Gupta, M.N. 1973. The Angiosperms (Anatomy and Embryology). Shivalal Agarwala and Company, Agra-3.
4. John Jothi Prakash, E. 2006. Outlines of Biotechnology. Emkay Publications, New Delhi – 110 055.

5. Maheswari, P. 1971. An Introduction to the Embryology of Angiosperms. Tata Mc Graw Hill Publishing House, New Delhi.
6. Mascarenhas, A.F. 1997. Handbook of Plant tissue culture. Published by ICAR, New Delhi.
7. Pandey, B.P. Embryology of Angiosperms. S. Chand and Company Ltd., Ram Nagar, New Delhi 110 055.
8. Pandey, S.N. and Chadha, A. 2005. Plant Anatomy and Embryology. Vikas Publishing House Pvt. Ltd., New Delhi.
9. Sharma, H.P. 2009. Plant Embryology – classical and experimental. Narosa Publishing House Pvt. Ltd., New Delhi.

SEMESTER – IV

Skill Based paper – Preservation of fruits and vegetables

(4 hrs/week – 4 credits)

Maximum Marks : 100

Unit – I

Fruits and vegetables – nutritive values, factors affecting storage, spoilage: microbial, enzymatic and insects.

Unit – II

Principles of preservation. Methods of preservation: refrigeration, freezing, canning, drying and dehydration, chemical preservatives.

Unit III

Methods of preparation of the following: Fruit Juice–Grape; Squashes- Orange and Pine apple; Jam – Tomato and Mixed fruit jam; Jellies – Guava.

Unit – IV

Preparation of Chutney – Mango, Sauces – tomato, Pickles – Lime, Mango and Garlic, Ketchup – Tomato. Drying of fruits: Banana, Mango, Grapes and Fig.

Unit – V

Canning of fruits – Mango and Banana; Canning of vegetables–Tomato Carrot, Bean and Mushrooms.

Demonstration

1. Preparation of jams, fruit juice, squash, Sauces, Pickles and ketchup.
2. Preservation of Banana, Grapes, Mango and Fig by drying.
3. Study of the containers for packaging of fruits and vegetables.
4. Visit to stations doing these preparations/ fruit farms to learn the preservation of fruits and vegetables.

References

1. Alex V. Ramani, 2009 Food Chemistry, MPJ Publishers, Chennai.
2. Cruess, W.V. 1948. Commercial Fruit and Vegetable products, Mc Graw Hill Book Company Inc., New York.
3. Kulshrestha, S.K. 1994. Food preservation, Vikas publishing House, New Delhi.
4. Swaminathan, M. 1992. Hand Book of Food Science and Experimental Foods, Bangalore printing and publishing Co.Ltd, Bangalore.
5. Siva Sankar, B. 2007. Food Processing and Preservation, Prentice Hall of India Private Limited – Delhi.
6. Swamynathan, M. 2008. Advanced Text Book on Food and Nutrition Vol. 2, The Bangalore Printing Publishing Co.Ltd. Bangalore.
7. Girdhari Lal, G.S. Siddappaa and Tandon, G.L. 1986 .Preservation of Fruits and Vegetables. Publications and Information Division, ICAR, New Delhi.
8. Kumar, N. 1999. Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
9. Usha Rani, C.K. and Mary Christi, R. 2010. Preservation of fruits and vegetables. Sheen Grafix, Nagercoil.

SEMESTER – IV

Skill Based Paper 2. Herbal Biotechnology

(4 hrs/week – 4 credits)

Maximum Marks : 100

Unit – I

Traditional systems of medicine - Siddha, Ayurveda and Homoeopathy- Medicinal plants and Pharmacognosy, Plants in Siddha medicine, Ayurveda, Homoeopathy - classification of Medicinal Plants.

Unit – II

Critical study of common medicinal plants. *Zingiber officinalis* - *Vetiveria zizanioides* - *Cassia angustifolia* - *Aloe vera* - *Ocimum sanctum* - *Azadirachta indica* - *Daemia extensa* - *Acalypha indica* - *Centella asistica* - *Phyllanthus amarus* – *Moringa oleifera*.

Unit III

Collection, cultivation and storage of medicinal plants - Methods of commercial cultivation of medicinal plants - harvesting, drying, garbling and other post harvest processing methods.

Unit – IV

Trading of medicinal plants - Domestic trade - local marketing - Conservation methods. Herbal farms - Biotechnology in the conservation of medicinal plants. Microscopical and chemical screening of drugs, Adulterants of herbs and herbal products.

Unit – V

Extraction of essential oils - Distillation, Types of distillation - water distillation, Steam distillation, Fractional distillation machinery for distillation. Extraction of Jasmine oil, Sandal wood oil, Clove oil and Lemon grass oil.

Demonstration

1. Identification of the medicinal plants included in the syllabus.
2. Models for water, steam, fractional distillation units.

3. Identification of common adulterants of medicinal plants.
4. Identification of Jasmine, sandal wood, clove and lemon grass oils.
5. Visit to herbal gardens and Industries preparing herbal medicines/ Siddha College.

References

1. Joshi, S.G. 2007. Medicinal plants. Oxford & IBH publishing Co.Pvt.Ltd., New Delhi.
2. Jain, S.K. 2004. A Manual of Ethnobotany. Scientific Publishers (India), Jodhpur.
3. Jain, S.K. 1968. Medicinal plants. National Book Trust, India, New Delhi.
4. Kokate, C.K., Purohit, A.P., Gokhale, S.B.2004. Pharmacognosy. Nirali Prakashnan, Jogeshwari Mandir Lane, Pune.
5. Rajaram Choyal. 2012. Aromatic and Essential oil plants, Sonali publications, New Delhi.
6. Anil kumar Dhiman. 2005. Wild Medicinal Plants of India (with Ethnomedicinal uses), Bishen Singh Mahendra Pal Singh, Dehra Dun.
7. John Jothi Prakash, E. 2004. Medicinal Botany Pharmacognosy. JPR Publications, Neyyoor.
8. John Jothi Prakash, E.2003. Medicinal and Aromatic plants, JPR Publications, Neyyoor.
9. Purohit, S.S. 2008. Medicinal Plants Cultivation: a scientific approach, Agrobios, Jodhpur.
10. Trivedi., P.C. 2008 Medicinal plants: Ethnobotanical Approach, Agrobios Jodhpur.

**PART IV
NON-MAJOR ELECTIVE**

1. Botany For Competitive Examination

(2 hrs/week- 2 Credits)

Unit I

Basics of the plant kingdom. A brief classification of plant kingdom. Diagnostic features of Algae, Fungi, Bryophyta, Pteridophyta, Gymnosperms, Bacteria, Viruses. Economic Importance of these groups.

Unit II

Basics of Angiosperm Taxonomy : A brief account of Natural system of classification (Bentham and Hooker's system) and phylogenetic system of Classification (Engler and Prantl's system).

Binomial nomenclature

A brief account of the following families and their economic importance : Fabaceae, Cucurbitaceae, Poaceae.

Unit III

Medicinal importance of the following plants : *Zingiber officinalis*, *Vetiveria zizanioides*, *Ocimum sanctum*, *Azadirachta indica*, *Solenum trilobatum*, *Phyllanthus emblica*, *Papaver somniferum*, *Phyllanthus amarus*.

Unit IV

Basics of Absorption of water, Transpiration, Photosynthesis, Respiration, Protein synthesis.

Unit V

Cell organelles. Tissues and tissue systems. An introduction to Genetics (Mendelism, Monohybrid cross and Dihybrid cross), Genetic Engineering, enzymes used in gene cloning experiments. An Introduction to plant tissue culture, Biofertilizers.

References :

1. Anjali Shukla. 2006. Hand Book of Biotechnology, Academic (India) Publishers, New Delhi.
2. John Jothi Prakash, E. 2004. Medicinal Botany and Pharmacognosy. JPR Publications, Zion Manai, North Street, Neyyoor – 629 802.
3. John Jothi Praksah, E. 2006. Outlines of Biotechnology. Emkay Publications, New Delhi – 110 055.
4. John Jothi Prakash, E., David Paul Ran, M. 2007. Genetics and Biostatistics. JPR Publications, Zion Manai, North Street, Neyyoor – 629 802.
5. John Jothi Prakash, E., 2003. Medicinal and aAromatic Plants. JPR Publications, Zion Manai, North Street, Neyyoor – 629 802.
6. Mohd. Amanullah, 2008 Molecular Biology and Biotechnology, Emkay Publications, B – 19, East Krishna Nagar, Swami Dayanand Marg, Delhi – 110 051.
7. Singh, V., Pande, P.C., and Jain, D.K. 2002. A Text Book of Botany for Degree Students. Rastogi Publications, Shivaji Road, Meerut – 250 002.
8. Vashista, P.C. 1985. Taxonomy of Angiosperms. Chand and Co. New Delhi.
9. Verma, V. 2005. A Text Book of Plant Physiology. Emkay Publications, B – 19, East Krishna Nagar, Delhi – 110 051.

**SEMESTER IV
NON-MAJOR ELECTIVE**

2. Bioresources

(2 hrs/week- 2 Credits)

Unit I

Biofertilizers – Scope and importance – Bacterial biofertilizer – Rhizobium – uses. Blue green algal biofertilizer – Nostoc – mass production and applications.

Unit II

Natural resources – biosphere – Forest resources – utility and values. Recycling of solid waste – vermicomposting.

Unit III

Energy plantations – Biofuels from lower plants – Diatoms – higher plants – *Jatropha*, *Pongamia* and *Calophyllum*.

Unit IV

Biopesticides – Definition and types – Bacterial biopesticides – *Bacillus thuringiensis* – Characteristics – mechanism of action, mass production and applications.

Unit V

Critical study of the following medicinal plants – morphology of the useful parts and medicinal uses: *Cyanodon*, *Zingiber*, *Ocimum*, *Azadirachta*, *Andrographis* and *Tylophora*.

Demonstrations

1. Biofertilizer – Nostoc mass production.
2. Visit to energy plantations.
3. Visit to medicinal gardens.

**B.Sc., PLANT BIOLOGY AND PLANT BIOTECHNOLOGY – MAJOR
Practical Paper: 2**

**PTERIDOPHYTES, GYMNOSPERMS, PALEOBOTANY,
DEVELOPMENTAL BOTANY AND EXPERIMENTAL EMBRYOLOGY**

Time: 3 Hours

Maximum: 60 Marks

1	Make suitable micro-preparations of A, B and C . Mount in glycerine. Draw labeled sketches and write notes giving reasons. Submit the slides for valuation.	3 x 9 = 27
2	Dissect out the Embryo of D and identify anyone stage and submit the slide for evaluation	7
3	Identify, draw labeled sketches, and write notes on: E, F, G, H and I	5 x 4 = 20
4	Record notebook	6

Key and Scheme of Valuation

Key:

- A:** Pteridophyte – Vegetative
- B:** Pteridophyte – Reproductive
- C:** Gymnosperm – Vegetative
- D:** Dissection of *Tridax* embryo
- E:** Pteridophyte – Specimen / slide
- F:** Gymnosperm – Specimen / slide
- G:** Paleobotany – Slide / photograph / drawing
- H:** Embryology – Slide / Photograph / diagram (Anther, ovule, Endosperm)
- I:** Embryology – Slide / Photograph / diagram (Anther culture, pollen culture, embryo culture)

Scheme of Valuation

1	A, B and C: Section – 2, Identification – 1, Systematic position – 1, Sketch – 2, Notes - 3	3 x 9	27
2	D: Embryo dissection (Any one stage)		7
3	E, F, G, H and I: Identification – 1, Sketch – 1, Notes – 2	5 x 4	20
4	Record notebook		6
	Total		60

SEMESTER – V

Paper VII (Core Subject) Taxonomy of Angiosperms

(4 hrs/week – 4 credits)

Maximum Marks : 100

Unit – I

Modification of root, stem and leaf. Phyllotaxy, types of inflorescence
Herbarium – Preparation – Significance.

Unit – II

Principles of taxonomic hierarchy (order, family, genus and species level).
Botanical nomenclature – merits and demerits. Systems of classification (with
merits and demerits) Natural – Bentham and Hooker; Phylogenetic – Engler and
Prantl.

Unit III

Critical study of the following families and their economic importance-
Annonaceae, Brassicaceae, Sterculiaceae, Rutaceae, Casesalpinaceae,
Myrtaceae.

Unit – IV

Cucurbitaceae, Apiaceae, Rubiaceae, Sapotaceae, Apocynaceae.

Unit – V

Asclepiadaceae, Lamiaceae, Euphorbiaceae, Liliaceae, Poaceae.

Practicals

1. Technical description of plant parts (vegetative and floral parts) with reference to the families prescribed.
2. Identification of local flora.
3. Identification of modification and economically important products from the members of the families prescribed in the syllabus.
4. Taxonomic field trip (minimum 2 days) under supervision and submission of TEN herbarium sheets and field note book. Must be submitted for external valuation.
5. To maintain a record book of practical for external evaluation.

References

1. Pandey, B.P. 2007. Botany for degree students Vol II. S. Chand and Co., New Delhi.
2. Pandey, B.P. 2006. Economic Botany. S. Chand and Co., New Delhi.
3. Pandey, B.P. 2006. Text Book of Botany : Angiosperms. S. Chand and Co., New Delhi.
4. Mondal, A.K. 2005 Advanced Plant Taxonomy, New Central Book Agency PVT. Ltd. Kolkata.
5. Pandey, B.P.1997. Taxonomy of Angiosperms S.Chand and Co., New Delhi.
6. Sivarajan, V.V. 1996. Introduction to the Principles of Plant Taxonomy. Oxford and Hill Publishing Co.Ltd., New Delhi.
7. Vashista, P.C. 1986. Taxonomy of Angiosperms. Chand and Co.New Delhi.
8. Chopra, G.L. 1985. Angiosperms. Pradeep Publications, Jalandhar.
9. Rendle, A.B. 1979. Classification of Flowering Plants. Vols. I and II. Vikas Publishing House, PVT Ltd., U.P.
10. Singh, V and Jain,. V. 1977. Taxonomy of Angiosperms. Rastogi Publications. Meerut.
11. Lawrence, G.H.M. 1973. Taxonomy of Vascular plants. Mac Millan Company, New York, U.S.A.

SEMESTER – V
Paper VIII (Core Subject): Biochemistry and Biophysics
(4 hrs/week – 4 credits)

Maximum Marks : 100

Unit – I

Basic concepts of Biochemistry: Brief account of atom, bonds-Ionic, covalent and Hydrogen bonds. Techniques in Biochemistry-pH metry, colorimetry, Paper chromatography and Centrifugation.

Unit – II

Carbohydrates : Basic structure and properties of monosaccharides – Glucose and Fructose. Disaccharides - Sucrose and maltose Polysaccharides - Cellulose and starch.

Unit III

Proteins: Primary, secondary, tertiary and quaternary structure of proteins, properties of proteins. Lipids: Classification, Basic structure and Properties.

Unit – IV

Enzyme: Nomenclature and classification, mechanism of enzyme action, properties of Enzymes, Bioenergetics Concept of free energy – Laws of Thermodynamics, Redox Potential, Mitochondrial bioenergetics, Structure and role of ATP.

Unit – V

Photobiology : Nature and properties of light, electromagnetic spectrum, absorption spectrum of chlorophyll, emission spectrum – Phosphorescence, Fluorescence and Bioluminescence.

Practicals

1. Titration of weak acid – Acetic acid.
2. Preparation of Buffer.
3. Determination of complementary colour.
4. Verification of Beer's Law.
5. Estimation of starch in plant tissues by colorimetry.

6. Estimation of sugar in plant tissues by colorimetry.
7. Separation of Dyes from a mixture by circular paper chromatography.
8. Qualitative tests (Demonstration only) for carbohydrates and proteins.
9. Spotters:-
 - a. Instruments :- pH meter, Electrodes of pH meter, Colorimeter, Centrifuge, Chromatogram.
 - b. Chemicals:- Chemical structure to be given for glucose, sucrose, cellulose, starch, Structure of protein (Primary, Tertiary), Palmitic acid and cholesterol.
 - c. Models and Charts:- Absorption spectrum of Chlorophyll, Fluorescence, Phosphorescence, Electromagnetic spectrum, Lock and key model, induced fit model of enzyme action.
 - d. To maintain a observation note book for external evaluation.

References

1. Wilson, K and Walker, J.2008 Principles and Techniques of Biochemistry and Molecular Biology, Cambridge University Press, New Delhi.
2. Satyanarayana, U and Chakrapani, U.2008, Essentials of Biochemistry. Books and Allied (P) Ltd., Kolkata – 700010.
3. John Jothi Prakash, E. and Joseph A.J. Raja 2002. An introduction to Biochemistry. JPR Publications, Neyyoor.
4. Jain, J.L. 2001. Fundamentals of Biochemistry. S. Chand and Co., New Delhi.
5. Conn.E.E. Stumpf P.K., Bruening, G. and Doi, R.H. 1987. Outlines of Biochemistry. John Wiley & Sons, Inc.
6. Lehninger, A.L. 1987. Biochemistry. CBS Publishers, New Delhi.
7. Stryer, L. 1986. Biochemistry. CBS Publishers, New Delhi.

SEMESTER – V
Major Elective 1. Techniques in Biotechnology
(5 hrs/week – 5 credits)

Maximum Marks : 100

Unit I :

Introduction – Definition – History – Scope and importance of plant tissue culture – Totipotency of cells. Tissue culture laboratory – organization and requirements – sterilization techniques – nutrient media – composition and preparation of M.S. medium.

Unit II :

Types of plant tissue culture – callus culture, Apical meristem culture, protoplast culture – isolation, fusion, selection of hybrid protoplasts and regeneration. Cybrids – applications. Artificial seed production – advantages and disadvantages.

Unit III :

Genetic engineering – Enzymes used in genetic engineering – Gene cloning vectors – plasmids, Ti plasmid – Genetic organization, types and significance. *Agrobacterium* mediated gene transfer in plants.

Unit IV :

Methods of direct gene transfer – Ultrasonication, Electroporation, Liposome mediated gene transfer, Particle bombardment gun method, pollen transformation through particle bombardment. Microinjection and Macroinjection.

Unit V :

Identification of recombinants – Insertional inactivation, immunochemical method and colony hybridization technique. Selection of recombinants using selective medium and reporter genes. Blotting techniques – Southern, Northern and Western Blotting.

Practical

1. Preparation of solid MS medium.
2. Callus culture from carrot explant.
3. Protoplast isolation.
4. Apical meristem culture.
5. Cybrid production.
6. Plasmid – Nopaline and Octopine Ti plasmid
7. Gene cloning in *E.coli* using pBR322.
8. *Agrobacterium* mediated gene transfer in plants.
9. Colony hybridization technique.
10. Blotting techniques – Southern, Northern and Western.

References

1. Gupta, P.K. 1994. Elements of Biotechnology. Rastogi and Company, Meerut, India.
2. Dubey, R.C. 2004. A Text Book of Biotechnology. S. Chand and Company, New Delhi.
3. Ignacimuthu, S. Basic Biotechnology. Tata Mc Graw Hill Publishing Company Ltd., New Delhi.
4. John Jothi Prakash, E. 1997. Outlines of Plant Biotechnology. JPR Publications, Neyyoor.
5. Kumar, H.D. 1998. Modern Concepts of Biotechnology. Vikas Publishing House, Pvt., New Delhi.

6. Kalyan Kumar De. 1992. An Introduction to Plant Tissue Culture, New Central Book Agency, Calcutta.
7. Razdan, M.K. 2003. "An Introduction to Plant Tissue Culture" Oxford and IBH Publishing Company Pvt. Ltd., New Delhi.
8. Kumaresan, V. 2009. Biotechnology. Saras Publication ARP Camp Road, Periavilai, Nagercoil.
9. Satyanarayana, U. 2008. "Biotechnology", Books and Allied (P) Ltd, Kolkata.
10. Das. H.K. 2005. Text book of Biotechnology. Wiley Dreamtech India Pvt., Ltd., Delhi.

SEMESTER – V

Major Elective 1. Forestry

(5hrs/week – 5 credits)

Maximum Marks : 100

Unit – I

Forest - Definition - Scope- Classification: Importance/ functions of forest, Forest as a balanced ecosystem; Types and distribution of forest with reference to India (Champion and Seth's classification).

Unit – II

Forest degradation - Damage caused by fire, climatic factors, and injuries by insects, plants, animals and diseases, activities of man including encroachment and shifting cultivation; Measures to protect the forest damage caused by various factors.

Unit III

Forest management and conservation - Regeneration - Tending operations - Sustainable utilization of forest resources - Forest organizations. Role of remote sensing in forest management.

Unit – IV

Agroforestry - objectives - advantages and disadvantages - Energy plantations; recreational forestry - role of botanical gardens, Zoos, National parks and Sanctuaries in recreation/ conservation of wild life.

Unit – V

Forest utilization - Harvesting, Conservation, Storage and Disposal of wood in forest; Major and minor forest products; Forest based industries - paper and pulp industry; resin tapping and turpentine manufacture; forest education in India.

Practicals

1. Identify and find out the uses of wood samples of common timbers.
2. Prepare maps showing forest types in India and Tamil Nadu.
3. Collect and study the remote sensing images showing forest vegetation in India and TamilNadu.
4. Prepare photographs of different forest types, nature of forest degradation.
5. Study of commonly used important forest products.
6. Identify any 10 minor forest products and record.
7. To maintain a record note book for external valuation.

References

1. Padhi, G.S. 1982. Forestry in India. Published by R.P.S. Book Distributors, Dehra Dun.
2. Sharma, L.C. 1978. Development of Forests and Forest based Industries. Published by Bishen Singh Mahendra Pal Singh, Dehra Dun.
3. Nagi, S.S. 1980. Indian Journal of Forestry Series - 1 to X.
4. Tribhawan Mehta, 1981. A Hand Book of Forest utilization. International Book Distributors, Dehra Dun.
5. Jerram, M.R.K, 1983. A text book on Forest Management. Periodical Expert Book Agency, Delhi.
6. Johnston, D.R., Grayson, A.J. and Bradley, R.T. 1978. Forest Planning. Natraj Publishers, Dehra Dun.

7. Sharma, L.C.1980. Forest Economies, Planning and Management. Bishen Singh Publications, Dehra Dun.
8. Benu Singh, 2010. A modern Book on Forestry and Horticulture, Vista International Publications, India.
9. Richard P. Tucker. 2011. A Forest History of India. Sage Publications, India.

SEMESTER – V

Elective II. Marine Biotechnology

(5hrs/week – 5 credits)

Maximum Marks : 100

Unit I

Oceanography - Oceans-Physical Properties: temperature, light, transparency, turbidity, tides and waves. Acoustic properties of seawater, Biosonar, Chemical properties: salinity, dissolved oxygen, pH (Oceanic acidification), nutrients, Calcification and its biological and nonbiological impact, trace elements. (Nature & Composition of Seawater) Zonation: types and lives in different zones; Oceanography interrelationship.

Unit II

Phytoplankton - Different groups, methods of floatation, algal bloom, toxins, Red tide, Biological pump, Iron fertilization, CLAW and anti-CLAW hypothesis, Global Pattern of thermal adaptation in marine phytoplankton.

Unit III

Mariculture, Sea ranching, Marine natural products - Marine organisms: an alternative source of potentialiy valuable natural products. Pharmaceuticals from marine organisms: anti - cancer, diagnostic and therapeutic.

Unit IV

Industries based on seaweed products. Marine flora and its potential role in research. Antibiotics, vitamins, bioadhesives and thermostable enzymes, confectionaries, food dyes, biopolymers and agar agar.

Unit V

Marine pollution – by heavy metals and radioactive wastes. Marine microorganisms, GMO capable of degrading and detoxing chlorinated hydrocarbons and other pollutants. Biofouling organisms - Problems due to biofouling - Antifouling paints and its environmental pollution - Biotechnological approach to biofouling control.

Reference Books:

1. Frank J. Millero, 2005. Chemical Oceanography. Published by CRC.
2. Clark, R.B. 2001. Marine Pollution, Published by Oxford University Press, USA.
3. Robert Bernard Clark, Chris Frid and Martin Attrill, 1997. Published by clarendon Press, Virginia.
4. Sharma, B. K and Kaur, H. 1994 Water Pollution. Krishna Prakashasn Media, Meerut, U.P.
5. Sharma, B.K and Kaur, H. 1994 Thermal and radioactive pollution. Krishna Prakashasn Media, Meerut, U.P.
6. Eric Hyatt, D. 1992. Biological populations as indicators of environmental change. Published by Environmental Protection Agency, US.
7. Kenneth A. Chandler, 1985 Marine and offshore corrosion Published by Butterworths, the university of Michigian.
8. David J.H. Phillips 1980 Quantitative aquatic biological indicators. Kluwer Academic Publishers, Netherland.
9. Goldberg, E.D 1976 The health of the Oceans Published by Unesco Press, Virginia.
10. Riley J.P and Skirrow, G. 1975- Chemical Oceanography (Vol: 1-10), Published by Academic Press.
11. Riley, J.P. and Chester, R.1971 Introduction to marine Chemistry, Published by Academic Press.

SEMESTER – V
Major Elective 2 Horticulture and Plant Breeding

(5 hrs/week – 5 credits)

Maximum Marks : 100

Unit – I

Importance of horticulture, seed propagation methods, advantages. Nurseries Transplantation, Orchard -layout – planting of fruit trees- Mango and Banana.

Unit – II

Vegetative propagation: Cuttage – stem, leaf and root cuttings; Layerage– simple, compound and air layering; Graftage – Tongue and approach grafting; Budding – “T” budding and patch budding. Advantages and disadvantages of vegetative propagation.

Unit III

Garden and gardening : Garden and its parts-hedge, edge, flower beds, arches, rockery, lawn, water garden. Establishment of kitchen garden and its importance. Indoor gardening – hanging baskets, terrarium, bottle garden. Techniques of bonsai making.

Unit – IV

Nature and scope of Plant breeding : Objectives; Selection methods – pure line and mass selection. Hybridization and hybridization techniques – emasculation – bagging, crossing, labeling and harvesting of hybrid seeds and raising F₁ generation.

Unit – V

Plant breeding : Production of new varieties. Breeding for disease resistance, Mutation breeding – Physical and chemical mutagens. Procedure and practices of mutation breeding.

Practicals

1. Preparation of nursery and seed bed.
2. Vegetative propagation- stem, leaf and root cuttings.
3. Air layering, budding and grafting techniques.

4. Designing kitchen garden and ornamental garden.
5. Demonstration – Rockery, hanging basket, pergola, topiary, bonsai and water garden.
6. Plant Breeding: Emasculation, bagging and crossing methods.
7. Visit to public gardens and horticultural research centres in and around TamilNadu.
8. Visit to Agricultural research and Plant Breeding centres.
9. To maintain a record note book for external evaluation.

References

1. Arora, J.S. 2008. Introductory Ornamental Horticulture. Kalyani Publishers.
2. Edmond, J.B., Senn, T.L., Andrews, F.S. and Halforce, R.G. 1990, Fundamentals of Horticulture. Tata Mc Graw Hill Pvt., Co. London.
3. Bose, T.K. and Mukherjee, D. 1982. Gardening in India. Oxford and IBH Publishing Co., New Delhi.
4. Manibhushan Rao, 2005. Horticulture. Macmillan India Ltd., New Delhi.
5. Hartman, H.T and Kester, D.E. 1976. Plant Propagation: Principles and Practices. Prentice Hall of India, New Delhi.
6. Randhawa, M.S. 1976. Gardening through the Ages. The Macmillan India Ltd., New Delhi.
7. Kumar, N. 1999. Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
8. Allard, R.W. 1980. Principles of Plant Breeding. John Wiley and Sons Inc., New York.
9. Sharma, J.K. 1984. Principles and practices of Plant Breeding. Tata Mc Graw Hill Publishing Co.Ltd., New Delhi.
10. Singh, B.D. 1999. Textbook of Plant Breeding. Kalyani Publishers, New Delhi.
11. Chaudhari, R.C. 1984. Plant Breeding. Published by Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
12. Chauhary, H.K. 2000. Plant Breeding. Published by Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
13. Grucharan Singh Randhawa, 1973. Ornamental Horticulture in India, ICAR. Today and Tomorrow's Publishers, Haryana.

SEMESTER – VI
Paper XII (Core Subject): Plant Physiology
(6 hrs/week – 5 credits)

Maximum Marks : 100

Unit – I

Water relations of plants: Importance of water to plant life. Imbibition, diffusion and osmosis, components of water potential and their relationship. Absorption of water: Mechanism of absorption. Ascent of sap: path of movement – evidences, theories. Water loss: Transpiration – types, physiology of stomatal movement, significance. Guttation and bleeding.

Unit – II

Mineral nutrition : Macro and micro nutrients and their role. Deficiency symptoms. Absorption of minerals- theories. Translocation of organic solutes – Mechanism of phloem transport- Source – sink relationship.

Unit III

Photosynthesis: Mechanism – Light and Dark Reactions. C₃ and C₄ pathways. Respiration : Types, Glycolysis and Kreb's cycle, oxidative phosphorylation. Significance of respiration.

Unit – IV

Nitrogen metabolism : fixation of molecular nitrogen – biological, nitrogen reduction, nitrogen cycle. Growth and development – Growth curves – phases; Physiological effects of auxins, gibberellins, cytokinins, ethylene and abscisic acid.

Unit – V

Physiology of flowering : Photoperiodism, Vernalisation and their practical applications. Seed dormancy – causes and methods of breaking dormancy.

Practicals

1. Determination of stomatal index and stomatal frequency.
2. Water potential – plasmolytic method.
3. Determination of water potential by Chardakov's method.

4. To study the effect of temperature on permeability of plasma memberane.
5. Rate of photosynthesis in different concentrations of bi-carbonate method.
6. Extraction and separation of chlorophyll pigments by ascending paper chromatography.
7. Respiration – Measurement of RQ using Ganong’s respirometer.

Demonstration only

1. Tissue tension
 2. Suction due to transpiration
 3. Ganong’s photometer
 4. Fermentation
 5. Arc auxanometer
 6. Clinostat
 7. Phototropism
- To maintain a record note book for external evaluation.

References

1. Bidwell, R.G.S. 1979. Plant Physiology. Mac Millan Publishing Company, New York.
2. Devlin, R.M., and Witham, F.H. 1974. Plant Physiology. CBR publishers and Distributors, New Delhi.
3. Jain, V.K. 2008. Fundamentals of Plant Physiology. S. Chand and Company, Ltd., New Delhi.
4. Kumar, A. and Purohit, S.S. 1998. Plant Physiology. Agrobotanica Bikaner.
5. Pandey, K.K. and Sinha, B.K. 1988. Plant Physiology. Vikas Publication New Delhi.
6. Salisbury, F.B, and Ross, C.W. 2004. Plant Physiology. Thompson Asia Pvt, Ltd, Singapore.
7. Verma, V.2005. A Text Book of Plant Physiology, Emkay Publications, New Delhi.
8. Wilkins, M.B. 1984. Advanced Plant Physiology. Long man scientific and Technical, England.

SEMESTER – VI
Paper XI (Core Subject): Genetics, Biometrics and Bioinformatics
(6 hrs/week – 5 credits)

Maximum Marks : 100

Unit – I

Mendel's law of Heredity with reference to Monohybrid and dihybrid crosses. Test cross – Monohybrid and Dihybrid. Incomplete dominance. Lethal genes – Dominant and Recessive lethal genes. Multiple alleles with reference to Blood groups in Man.

Unit – II

Interaction of genes: Inheritance of comb shapes in fowls, Dominant epistasis, Complementary genes, Duplicate genes, Polygenic inheritance : Ear length in corn.

Unit III

DNA as the genetic material. Molecular structure of DNA. Replication of DNA-types. Genetic code. Regulation of gene activity-operon concept- Lac operon.

Unit – IV

Biometrics: Collection and interpretation of data. Measures of central tendencies: Mean, Mode and Median. Measures of dispersion: Standard Deviation, Chi -square test.

Unit – V

Introduction to Bioinformatics: Basic knowledge in computer, Internet and Browsing websites. Virtual library, online literature, DNA and Protein Databases. FASTA format. Gene bank. Enzyme Data bases.

Practicals

1. To work out simple genetic problems in monohybrid crosses, incomplete dominance and lethal genes.
2. To work out genetic problems in dihybrid crosses and interaction of genes prescribed in the syllabus.
3. Using available data, calculate the Mean and Standard Deviation.

4. Test the hypothesis using Chi-square test.
5. To get a basic knowledge in computer operation.
6. To maintain an observation note book for external valuation.

References

1. Sinnott, E.W., Dunn, L.C and Dobzhansky, T.1976. Principles of Genetics. Tata Mc Graw Hill Publishing Company Ltd., New Delhi.
2. Stickberger, M.W.2005. Genetics. Prentice Hall of India, New Delhi.
3. John Jothi Prakash. E., and David Paulraj, M.2007. Genetics and Biostatistics, JPR Publications, Neyyor.
4. Gupta, P.K. 1991. Genetics. Rastogi Publications, Merrut.
5. Verma, P.S. and Agarwal, V.L. 1991. Genetics, S. Chand and Co., New Delhi.
6. Lewin, B. 2010. Gene XI. Prentice Hall of India, New Delhi.
7. Bryan Bergeron, M.D. 2007. Bioinformatias computing. Dorling Kindersley (India) Private Ltd., New Delhi.
8. Mani, K and Vijayaraj. N. 2003. Bioinformatics for the Beginners Kalaikatheer Achagam, Coimbatore.
9. Attwood, T.K and Parry, S. 1999. Introduction to Bioinformatics. Addison Wesley Longman Ltd.
10. Arthur M. Lesk. 2005. Introduction to Bioinformatics Oxford University Press, New Delhi.

SEMESTER – VI

Paper XIII (Core Subject): Applied Biotechnology

(5 hrs/week – 5 credits)

Maximum Marks : 100

Unit – I

Environmental Biotechnology : Basic concepts, aim and scope; Pollution monitoring – biotechnological methods, bioassays, biosensors, Biological treatment of waste water. Role of molecular biology in environmental monitoring.

Unit – II

Agricultural Biotechnology: Micropropagation – techniques, factors affecting micropropagation and applications. Biofertilizers – Mass cultivation and application techniques of *Rhizobium*, *Azolla* and Phosphobacteria. Petroleum plants – alternative fuel.

Unit III

Transgenic plants: Production of disease resistant plants, herbicide resistant plants, plants with improved crop yield and nutritional quality. Transgenic plants as bioreactors – metabolic engineering of carbohydrates, lipids and proteins.

Unit – IV

Industrial Biotechnology : Production of secondary metabolites through cell suspension culture. Industrial production of therapeutic agents – Penicillin, tetracyclines. Production of beverages. Application of immobilized enzymes - therapeutic, analytical, manipulative and industrial (dairy, detergent, starch, brewing and wine industries).

Unit – V

Food and medical Biotechnology: Single Cell Proteins (SCP), Mycoproteins and aminoacids (glutamic acid). Nutritional values of *Scenedesmus*, yeast and Bacteria. Mushroom technology: Cultivation techniques - *Pleurotus*. Role of biotechnology in healthcare. Immuno therapeutic drugs: edible vaccines, edible antibiotics and edible interferons.

Practicals

1. Biological treatment of waste water – Trickling filter, Oxidation pond, Anaerobic digestion.
2. Biosensors – Blood glucose biosensor, Pesticide biosensor.
3. Micropropagation – Apical meristem culture and Nodal culture
4. Biofertilizers – Mass cultivation of *Azolla* and *Rhizobium*
5. Petroleum plants: *Jatropha*, *Calotropis*, *Pongamia*.
6. Transgenic plants – Sunbean, Golden rice and Bt.cotton.
7. Bioreactor for Penicillin production.

8. Fermentor for Beverages – Beer.
9. SCP production – Yeast and *Scenedesmus*.
10. Production of glutamic acid.
11. Demonstration of mushroom culture.
12. Edible vaccine production.

References

1. Anjali Shukla.2006. Hand Book of Biotechnology. Academic Publishers, New Delhi.
2. Bernard, R.G. and Jack J. Pasternak. 2002. Molecular Biotechnology, Panima publishing Corporation, Bangalore.
3. Ignacimuthu, S. 2002. Basic Biotechnology. Tata Mc Graw Hill Publishing Company, New Delhi.
4. John Jothi Prakash, E.2007. Outlines of Biotechnology. Emkay Publications, Delhi.
5. Kakralya, B.1 and Abuja, 1. 2001. Transgenic plants. Agrobios.
6. Proma, L.P. 2006. Applied Biotechnology. MJP Publishers, Chennai.
7. Vijaya Ramesh, K. 2004. Environmental Microbiology, MJP Publishers, Chennai.
8. Jogdand, S.N. 2000. Medical Biotechnology, Himalayan Publishing House.
9. Kumar, H.D., 1998. Modern Concepts of Biotechnology. Vikas Publishing House, Pvt., New Delhi.
10. Kalyan Kumar De. 1992. An Introduction to Plant Tissue Culture, New Central Book agency, Calcutta.
11. Razdan M.K. 2003. “An Introduction to Plant Tissue Culture” Oxford and IBH Publishing Company, Pvt. Ltd., New Delhi.
12. Kumaresan, V. 2009. Biotechnology. Saras Publication, Nagercoil.
13. Satyanarayana, U. 2008. Biotechnology Books and Allied (P) Ltd, Kolkata.
14. H.K. Das, 2005. Text book of Biotechnology. Wiley Dreamtech India Pvt., Ltd., Delhi.
15. Dubey, R.C.2005. A Text book of Biotechnology, S. Chand and Company, New Delhi.

SEMESTER – VI
Major Elective I
Environmental Biotechnology
(5 hrs/week – 5 credits)

Maximum Marks : 100

Unit – I

Environmental spheres – Hydrosphere, atmosphere, geosphere, biosphere and anthrosphere. Aims and scope of environmental Biotechnology Pollution measurement Biotechnological methods for measurement of pollution, criteria for biomonitoring of pollution. Cell biology in environmental monitoring and role of biosensors in pollution monitoring. Biotechnological methods for management of metal pollution.

Unit – II

Biofuels: Biogas – Production of biogas, stages of methanogenesis, methane production from hydrocarbons, uses of biogas, Hydrogen production – importance of biological production of hydrogen, microbial production of hydrogen, uses of hydrogen production technology. Petroleum plants – *Calotropis*, *Euphorbia tirucalli*, *Jatropha curcas*.

Unit III

Sewage treatment - primary, secondary and tertiary treatment, water recycling. Soil conservation and restoration. Sustainable agricultural management.

Unit – IV

Biodegradation and Bioremediation - Solid waste treatment and disposal, Biodegradation of hydrocarbons, pesticides and herbicides Bioremediation. Types of reactions in bioremediation, Genetically engineered microorganism in bioremediation.

Unit – V

Global environmental problems. Green house effect and global warming, measures to control green house effect. Ozone depletion, effects, and control measures. Acid rains: effect of acid rain - Causes, effects and measures of control. Remote sensing and its applications in ecology.

References

1. Saha, T.K. 2008. Ecology and Environmental Biology. Books and Allied (P) Ltd., Kolkotta.
2. Tyler Miller Jr. G.2004. Environmental Science: Working with the earth. Thompson Asia Pvt. Ltd., Singapore.
3. Shukla, R.S., and Chandel, P.S.2007. A text book of Plant Ecology. S.Chand and Company, Ltd., New Delhi.
4. Mishra, D.D. 2008. Fundamental Concepts in environmental studies. S. Chand and Company, Ltd., New Delhi.
5. Singh, H.R. Environmental Biology. S. Chand and Company, Ltd., New Delhi.
6. Kumaresan, V. 2009. Biotechnology. Saras Publication, Nagercoil.
7. Satyanarayana, U. 2008. Biotechnology Books and Allied (P) Ltd, Kolkata.
8. H.K. Das, 2005. Text book of Biotechnology. Wiley Dreamtech India Pvt., Ltd., Delhi.
9. Vijaya Ramesh, K. 2004. Environmental Microbiology, MJP Publishers, Chennai.
10. Dubey, R.C.2005. A Text book of Biotechnology, S. Chand and Company, New Delhi.

SEMESTER – VI
Major Elective 2. Computer Applications
(5 hrs/week – 5 credits)

Maximum Marks : 100

Unit – I

Computer in biological science – scope and prospects – components of a computer – Hardware – CPU and other peripheral devices. Software – Folders, Files, File management; Types of computer, working principle of a computer.

Unit – II

Database Management system – components, Data Definition Language, Query processing, Transaction processing. Storage and Buffer management. Database system studies – Design of databases, Data base programming, Database system implementation.

Unit III

Interactive communication – Overview, Types and need for communication Networks, Communication media – Guided, unguided media and Network topologies.

Unit – IV

MS Office Software – components, MS – Word, MS- Excel, Simple graphics – Line, Bar and Pie charts – MS – Powerpoint.

Unit – V

Information Network – Internet – Internet protocol, Domain Names, Internet, Browsing e-mail, Mailtransfer agents. Web sites, e-journal, e-book.

References

1. Jeffrey D. Ullman and Jennifer Widom, 2007. A First course in Database Systems. Published by Dorling Kindersley (India) Pvt. Ltd., New Delhi.
2. Bryan Bergeron, M.D. 2007. Bioinformatics Computing. Published by Dorling Kindersley (India) Pvt. Ltd., New Delhi.
3. Prakash S. Lohar, 2009. Bioinformatics. MJP publishers, Chennai.
4. Murthy, C.S.V. 2004. “Bioinformatics”. Himalaya Publishing House, Hyderabad.
5. Rastogi, S.C, Namitta Mendirala and Parag Rastogi, 2005. Bioinformatics – Concepts, skill and applications. Rastogi Publications, New Delhi.

B.SC., PLANT BIOLOGY AND PLANT BIOTECHNOLOGY – MAJOR

Practical Paper : 3

Taxonomy of Angiosperms and Elective I & Elective II

(Subject Code :)

Time : 3 Hours

Maximum : 60 Marks

1.	Refer specimens A and B to their respective families giving reasons. Write the systematic position. Sketches not required.	10
2.	Describe specimen C in technical terms. Draw labeled sketches of the floral parts only. Dissect and display the floral parts and submit the slides for valuation.	10
3.	Identify, draw labeled sketches and describe the morphology of the useful parts of D	3
4.	Identify, draw labeled sketches and write notes on E, F, G, H, I and J	24
5.	Write the botanical name of K and L	2
6.	Herbarium + Field note book	5
7.	Record note book	6
	Total	60

Key and Scheme of Valuation

Key

1. **A** and **B** Specimens from the families prescribed in the syllabus.
2. **C** Any specimen from the families prescribed in the syllabus
3. **D** Materials prescribed in the syllabus.
4. **E, F** and **G** – Spotters pertained to Elective I (Techniques in Biotechnology / Forestry). **H, I** and **J** – Spotters pertained to Elective II (Marine Biotechnology / Horticulture and Plant Breeding).
5. **K** and **L** -Plant from the prescribed families.
6. Properly identified herbarium specimens: 10 numbers with Field note book.
7. Record note book.

Scheme of Valuation

1.	A and B : Identification – 1; Systematic position – 1; reasons – 3	2 x 5 = 10
2.	C : Description – 3; Sketch – 3; Floral diagram – 1 ; floral formula – 1; Display of floral parts – 2	10
3.	D : Genus – ½ Species – ½ Sketch – 1 description of the morphology of the useful part – 1	3
4.	E, F,G,H, I and J : Identification – 1; Diagram – 1, Notes – 2	6 x 4 = 24
5.	K and L : Genus ½ Species ½	1 x 2 = 2
6.	10 Herbarium specimens with field note book	5
7.	Record note book	6
	Total	60

B.SC. PLANT BIOLOGY AND PLANT BIOTECHNOLOGY – MAJOR

Practical Paper : 4

Biochemistry, Biophysics, Genetics, Biometrics and Bioinformatics

(Subject Code :)

Time : 3 Hours

Maximum : 60 Marks

1.	Take a lot from the given set of experiments. Write the procedure. Perform the experiment. Collect data and interpret the results.	20
2.	Identify, draw labeled sketches and write notes on A and B .	4x2 = 8
3.	Solve the given genetic problem C and D and interpret	C : 4 D: 8 12
4.	Work out the frequency distribution, mean and standard deviation for the data provided (E).	14
5.	Record note book	6
	Total	60

Key and Scheme of Valuation

Key

1. Experiments prescribed in the syllabus.
2. A : Instruments
B : Models/ Charts.
3. C : Monohybrid Cross and Incomplete dominance.
D : Dihybrid cross and Interaction of factors pertained to the syllabus.
4. E : Working out Biostatistics data provided.
5. Record note book.

Scheme of valuation

1.	Biochemistry Experiment : Requirements -2 ; Procedure 6; Tabulation -3; Calculation and result -5; Interpretation -4	20
2.	A : Any instrument specified in the syllabus B : Model / Chart prescribed Identification – 1 Diagram – 1 Notes – 2	$4 \times 2 = 8$
3.	C : Monohybrid cross problem – 4 D : Dihybrid cross problem – 8	$4 + 8 = 12$
4	E : Working out Biostatistics data Frequency Distribution – 5 Mean – 3 Standard Deviation – 6	14
5	Record note book	6
	Total	60

B.SC., PLANT BIOLOGY AND PLANT BIOTECHNOLOGY – MAJOR
Practical Paper : 5
Plant Physiology and Applied Biotechnology

Time : 3 Hours

1.	Take a lot from the given set of experiments. Write the procedure. Perform the experiment. Collect data and interpret the results.	22
2.	Comment on the Plant Physiology experiment set-up. A	7
3.	Write notes of interest on : B,C, D, E and F	5 x 5=25
4.	Record note book.	6
	Total	60

Key and Scheme of Valuation

Key

1. Experiments prescribed in the syllabus.
2. **A.** Plant Physiology Experiment set up.
3. **B,C, D, E** and **F** : Spot at sight from Applied biotechnology paper.
4. Record note book.

Scheme of Valuation

Time : 3 Hours

Maximum : 60 Marks

1.	Plant Physiology experiment. Procedure – 5; Set up – 7; Observation and Tabulation – 7; interpretation – 3	22
2.	Experiment set up from Plant Physiology A. Identification – 1 ; Diagram – 2; Notes – 4	7
3.	B,C, D, E and F : Spot at sight from Applied Biotechnology Identification- 1; Sketch – 1; Notes – 3	5x5= 25
4	Record note book	6
	Total	60

APPENDIX- AZ47

MANONMANIAM SUNDARANAR UNIVERISTY, TIRUNELVELI-12

B.SC., Zoology (CBCS)

(With effect from the Academic Year 2012 – 2013 Onwards)

SCHEME OF EXAMINATIONS

1. Eligibility for Admission

The candidates for admission into the first semester of the **B.Sc., degree in Zoology** course will be required to have qualified the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Government of Tamilnadu or any other Examinations accepted by the syndicate as equivalent there to in Science subject.

2. Duration of the Course

The students shall undergo the prescribed course of study for a period of not less than three academic years (Six semesters). The semester contains 90 working days.

3. Scheme of the Course

I Semester

	Components	Hours	Credits
Part I	Tamil/other languages	6	3
Part II	English	6	3
Part III	<u>Core Papers</u>		
	Animal Diversity - I Invertebrata	4	4
	Animal Diversity - II Chordata	4	4
	Major Practical	2	-
	<u>Allied subject I</u>		
	Cell Biology, Genetics and Biotechnology	4	4
	Allied Practical	2	-
Part IV	Environmental Studies	2	2
	Total	30	20

II Semester

	Components	Hours	Credits
Part I	Tamil/other languages	6	3
Part II	English	6	3
Part III	<u>Core Papers</u>		
	Developmental Zoology	4	4
	Ecology, Toxicology & Evolution	4	4
	Major Practical	2	2
Part III	<u>Allied subject I</u>		
	Developmental Zoology, Ecology, Animal Physiology & Evolution	4	4
	Allied Practical	2	2
Part IV	Value Based Education	2	2
	Total	30	24

III Semester

	Components	Hours	Credits	
Part I	Tamil/other languages	6	3	
Part II	English	6	3	
Part III	<u>Core Papers</u>			
	Cell and Molecular Biology	4	4	
	Major Practical	2	-	
	Allied Subject II (Theory)	4	4	
Part III	Allied Practical	2	-	
	Part IV	Skill Based Subjects: (any one)	4	4
		Home Aquarium		
		Nutrition and Dietetics		
		Non Major Elective: (any one)	2	2
Beekeeping				
Part IV	Clinical Biology			
	Total	30	20	

IV Semester

	Components	Hours	Credits	
Part I	Tamil/other languages	6	3	
Part II	English	6	3	
Part III	<u>Core Papers</u>			
	Genetics	4	4	
	Major Practical	2	2	
	Allied Subject II	4	4	
Part III	Allied Practical	2	2	
	Part IV	Skill Based Subjects: (any one)	4	4
		Biophysics and Bioinstrumentation		
		Vermitechnology		
		Non Major Elective: (any one)	2	2
Public Health and Hygiene				
Part IV	Community and Social Preventive Medicine			
	Part V	Extension Activity (NCC, NSS, YRC, YWF)	-	1
	Total	30	25	

V Semester

	Components	Hours	Credits
Part III	<u>Core Papers</u>		
	Animal Physiology and Biochemistry	4	4
	Animal Biotechnology	4	4
	Elective: (any one)	5	5
	Sericulture		
	Economic Entomology		
	Dairy Farming		
	Elective: (any one)	5	5
	Apiculture		
	Food and Food Processing Technology		
	Poultry Science		
	Major Practical		
	Practical I	3	-
Practical II	3	-	
Practical III	2	-	
Part IV	Common Skill Based Subjects: (any one)	4	4
	Effective Communication		
	Personality Development		
	Total	30	22

VI Semester

	Components	Hours	Credits
Part III	<u>Core Papers</u>		
	Applied Biotechnology	5	4
	Immunology and Microbiology	6	4
	Biostatistics, Computer applications & Bioinformatics	6	4
	Major Practical		
	Practical I	3	4
	Practical II	3	4
	Practical III	3	4
	Elective: (any one)	2	4
	Aquaculture	5	5
	Medical Laboratory Technology		
	Marine Biology		
	Total	30	29

Total number of hours: 180

Total number of Credits : 140

Distribution of marks in Theory between External and Internal Assessment is 75:25. For Practicals 60:40; Minimum Pass is 40% for external and overall components.

MANONMANIAM SUNDARANAR UNIVERISTY
B.Sc. Zoology
Subject of study and scheme of Examinations
(For candidates admitted to the course in the academic year
2012 -2013 and afterwards under CBCS)

Semester	Course	Title of the course	Teaching Hrs/Week	Exam Hours	Internal Marks	External Marks		Min Pass	Total Marks	Credits	
						Passing min	Marks max				
I	1.1	Animal Diversity - I Invertebrata	4	3	25	30	75	40	100	4	
	1.2	Animal Diversity - II Chordata	4	3	25	30	75	40	100	4	
	1.3	Major Practical (1.1 & 1.2)	2	Exam at the end of the second semester							
	1.4	Environmental Studies	2	3	25	30	75	40	100	2	
II	2.1	Developmental Zoology	4	3	25	30	75	40	100	4	
	2.2	Ecology, Toxicology & Evolution	4	3	25	30	75	40	100	4	
	2.3	Major Practical (2.1 & 2.2)	2	Exam at the end of the second semester							
	2.4	Value Based Education	2	3	25	24	75	40	100	2	
III	3.1	Cell and Molecular Biology	4	3	25	24	75	40	100	4	
		Major Practical (3.1)	2	Exam at the end of the fourth semester							
		Skill Based Subjects: (any one)									
	3.2A	Home Aquarium	4	3	25	24	75	40	100	4	
	3.2B	Nutrition and Dietetics									
	Non Major Elective: (any one)										
	3.3A	Beekeeping	2	3	25	30	75	40	100	2	
	3.3B	Clinical Biology									
IV	4.1	Genetics	4	3	25	30	75	40	100	4	
		Major Practical (4.1)	2	Exam at the end of the fourth semester							
		Skill Based Subjects: (any one)									
	4.2A	Biophysics and Bioinstrumentation	4	3	25	30	75	40	100	4	
	4.2B	Vermitechnology									
	Non Major Elective: (any one)										
	4.3A	Public Health and Hygiene	2	3	25	30	75	40	100	2	
	4.3B	Community and Social Preventive Medicine									
		Major Practical Exam-II (3.1 & 4.1)		3	40*	24	60	40	100	2	
V	5.1	Animal Physiology and Biochemistry	4	3	25	30	75	40	100	4	
	5.2	Animal Biotechnology	4	3	25	30	75	40	100	4	
		Common Skill Based Subjects: (any one)									
	5.3A	Effective Communication	4	3	25	30	75	40	100	4	
	5.3B	Personality Development									
		Elective: (any one)									
	5.4A	Sericulture	5	3	25	30	75	40	100	5	
	5.4B	Economic Entomology									
5.4C	Dairy Farming										
	Elective: (any one)										
	5.5A	Apiculture	5	3	25	30	75	40	100	5	
	5.5B	Food and Food Processing Technology									
	5.5C	Poultry Science									
		Practical 5.1	2	Exam at the end of the sixth semester							

	Practical 5.2	2	Exam	at the	end of the	sixth	semester		
	Practical 5.4A / 5.4B / 5.4C	2	Exam	at the	end of the	sixth	semester		
	Practical 5.5A / 5.5B / 5.5C	2	Exam	at the	end of the	sixth	semester		
6.1	Applied Biotechnology	5	3	25	30	75	35	100	4
6.2	Immunology and Microbiology	6	3	25	30	75	35	100	4
6.3	Biostatistics, Computer applications & Bioinformatics	6	3	25	30	75	35	100	4
	Elective: (any one)								
VI	6.4A Aquaculture		Theory-5						
	6.4B Medical Laboratory Technology		3	25	30	75	40	100	5
	6.4C Marine Biology								
	Practical 6.1	2	Exam	at the	end of the	sixth	semester		
	Practical 6.2	2	Exam	at the	end of the	sixth	semester		
	Practical 6.3	2	Exam	at the	end of the	sixth	semester		
	Major Practical Exam-III (5.1 & 5.2)		3	40*	24	60	40	100	4
	Major Practical Exam-IV (6.1, 6.2 & 6.3)		3	40*	24	60	40	100	4
	Major Practical Exam-V (5.4 anyone, 5.5 anyone & 6.4 anyone)		3	40*	24	60	40	100	4

* The break up for internal practicals shall be (Practical test – 20; Class work – 10; Regularity - 5 & Record - 5)

SEMESTER – III

PAPER 3.1 CELL & MOLECULAR BIOLOGY (4 Hrs/Week)

UNIT I

Cell types – Prokaryotic & Eukaryotic. Microscopy – detailed study of compound microscope, phase contrast, & electron microscope microscopes, Cytological techniques – Fixation & Fixatives – types of stains.

UNIT II

Ultrastructure & functions of the following cell organelles: Plasma membrane, mitochondria, Golgi apparatus, endoplasmic reticulum, ribosomes, lysosomes, centriole.

UNIT III

Nuclear components: Ultrastructure & functions of nucleus, nuclear membrane, nucleolus, Chromosomes & their types, Cancer cells & Carcinogenesis: Definition, types, causes, properties, treatment, Oncogenes.

UNIT IV

DNA : DNA as genetic material, Base pairs, constancy of DNA structure & Replication, Hybridization, Cell division – mitosis & mitotic apparatus, Meiosis & Synaptonemal complex.

UNIT V

Different types of RNA, transcription, functional UNIT of gene, promoter, coding sequences, processing of ribosomal RNA, inhibitors of transcription various steps in protein synthesis. Genetic code – Codons, anticodons, control of gene expression.

PRACTICALS

1. Mitosis in Onion root tip cells.
2. Giant chromosomes in Chironomous larva.
3. Preparation of a) Squamous epithelium, b) Human blood smear, c) Frog blood smear.
4. Models & Charts: DNA, RNA, Ribosomes, Nucleus, Mitochondria, Golgi apparatus, Endoplasmic reticulum, Protein synthesis.

Reference Books

1. Ambrose, E.J & Dorothy, M.E: Cell Biology (ELBS CAMLOT PRESS).
2. De Robertis & De Robertis : Cell & Molecular Biology. (W.B. Saunders & co, Philadelphia).
3. De Robertis, E.D.P, Nowinski, W. N & Saez, F. A : Cell Biology (W. B. Saunders & Co, Philadelphia).
4. Dupraw, E J : Cell & Molecular Biology (Academic press, New York).
5. Dyson, R. D : Essentials of Cell Biology (Allyn & Bacon Inc. Boston).
Giese. A. C : Cell Physiology (W. B. Saunders & co, Philadelphia).
6. Norman. S. Cohn : Elements of Cytology (Freeman Book co, Kamia Nager, New Delhi).
7. Swanson, C.P & Webster, B : The Cell (Prentice Hall Inc., Engle Wook Cliffs, New Jersey).

SEMETER III SKILL-BASED SUBJECTS Paper 3.2.A HOME AQUARIUM (4Hrs./week)

UNIT I

Construction of Home aquarium
Materials needed- wooden and metal frames- frameless tanks- sealants and gums
Design and construction of public freshwater and marine aquaria
Aerators and filters- hand net and other equipment
Water quality requirements - Temperature control and Lighting

UNIT II

Setting up aquarium- gravel/pebbles- plants-ornamental objects and fishes- selection of species-Introducing fishes to the aquarium
Nutritional requirements of aquarium fishes
Different kinds of feeds
Culture of food organisms
Preparation of dry feeds
Feeding methods

UNIT III

Species of ornamental fishes- taxonomy and biology of gold fish, guppies, swordtails, marine fishes- angels and butterfly fishes

Fresh water species- live bearers and egg layers, one example each -

Common Community fishes- freshwater and marine, any two examples each -

UNIT IV

Reproductive biology of gold fish and angel fish - Maturation, secondary sexual characters, breeding habits, spawning, parental care, fertilization and development of eggs.

Common diseases of freshwater and marine aquarium fishes - parasites, fungal, bacterial - symptoms – treatment - prevention and control

UNIT V

Fresh water plants- their taxonomy and morphology, any three of aquarium plants- provision of nutrient and optimum environmental condition for their growth.

Other ornamental organisms-Anemones, lobsters, shrimps, Octopus, star fish etc.

Reference Books:

1. Guide to tropical Fish Keeping, 1967, Braymer, J.H.P. I Liffe.
2. Tropical Marine aquaria, 1974. Cox, J.F. Hamlyn.
3. Tropical Fish: Setting up and maintaining fresh water and Marine aquaria, 1972. Dussa Octopus Book Ltd.
4. Aquarium systems, 1981. Hawkins, A.S. (Ed.) Academic Press.
5. Living Aquarium, 1981. Hunnam, P. Ward Lock
6. Aquarium Fishes and Plants, 1971, Rataj, K. and R. Zukal- Hamlyn.
7. Ornamental Fish for Garden and Home Aquariums, 1956. R and, C.P. Home Aquariums
8. Sea Water Aquariums, 1979. Spotte, S. John Wiley.
9. Collins Guide to Aquarium Fishes and Plants, 1969. Schiotz, A. Collins.
10. Complete Aquarium, 1963. Vogt, D. and H. Wermuth Thames.

SEMETER III

PAPER: 3.2.B NUTRITION AND DIETETICS

(4hrs. /Week)

OBJECTIVE:

To understand the importance of the various food stuff on one side and to study malnutrition, nutrition related diseases and special diets for persons suffering from diseases on the other,

Unit I

- ❖ Macronutrients and their function – Carbohydrates – Fats- Proteins – Water.
- ❖ Micronutrients and their function- Vitamins and minerals.
- ❖ Nutritive value of the foodstuff – Cereals – Pulses – Vegetables – Fruits – Milk – Egg – meat - fish.

Unit II

- ❖ Parboiling of rice –process of parboiling and uses of parboiled rice.
- ❖ Germination of cereals – process of germination and uses of sprouts
- ❖ Metabolism of food stuffs – protein ,carbohydrate and lipid.
- ❖ Food choice and preparation methods.
- ❖ Effect of cooking on protein, carbohydrate and fat.
- ❖ Menu planning – meal pattern-vegetarian and non-vegetarian.

Unit III

- ❖ Role of fibres in nutrition
- ❖ Determination of energy content of food – Bomb calorimeter.
- ❖ BMR – Determination of DMR –using direct calorimetre and Benedict – Roth basal metabolic apparatus – Factors affecting BMR.

Unit IV

- ❖ Balanced diet – Nutritional requirements of different age groups – Pre schoolers – Schoolers – Adolescents – Pregnant and lactating women.
- ❖ Nutritional diseases – Causes and prevention and dietary management of malnutrition,under nutrition and obesity.
- ❖ Common nutritional deficiencies in India – Kwashiorkar – Marasmas – Anaemia – Goitre.

Unit V

- ❖ Importance of diet in diseases – Detection, causative factors.
- ❖ Therapeutic diet and its importance,diet planning
- ❖ Symptoms,causes, prevention and dietary management for diabetes mellitus, ulcer, renal diseases, hepatitis, hypertension, atherosclerosis, gastro-intestinal disorders, constipation.

Reference Books:

1. Ann Louise Gittleman. The Fat Flush Plan. Tata mc Graw Hill Publishing Company Limited, 444/1, Sri Emabara Naicker Industrial Estate, Alapakkam, Porur, Chennai
2. Hellen Kowtaluk. Food for Today, Tata Mc Graw Hill Publishing Company Limited, 444/1, Sri Emabara Naicker Industrial Estate, Alapakkam, Porur, Chennai
3. Shubhangini A. Joshi, Nutrition and Dietetics. T Tata Mc Graw Hill Publishing Company Limited, 444/1, Sri Emabara Naicker Industrial Estate, Alapakkam, Porur, Chennai
4. Swaminathan, M. Food Science, Chemistry and Experiment.
5. Swaminathan, M. Principles of Nutrition and Dietetics.
6. You and Your food and its utilization. Manuscript. IGNOU.
7. Rajalakshmi, R. Applied Nutrition.
8. Sumathi, R. Mudambi and M.V. Rajagopal. Fundamentals of food and nutrition.
9. Stanely Davidson, Passmore, R. Nutrition and Dietetics
10. Pogy, S., Stanfield. Nutrition and Diet therapy.
11. Fergos Clydesdate, M. Food Nutrition and Helath.

Semester – III
PAPER 3.3A BEE KEEPING
(Non Major Elective)

Unit – I

Rock bee, Indian bee, Little bee and Dammer bee - Life history of *Apis indica*.
Identification of Queen, Drones and Workers.

Unit –II

Food of the bee – honey and pollen.
Relationship of Plants and Bees.
Arranging an apiary position – space - direction.

Unit – III

Acquiring bees – Care of newly captured colonies .
Newton’s bee hive and its architecture
Different kinds of cells.

Unit – IV

Primitive hives –different types
Disadvantages of primitive hives
Appliances used in apiaries.

Unit – V

Honey – Extraction of honey – preservation and storage of honey – Properties, Chemical composition, Nutritive value, medicinal values – Honey as daily Food.

References:

1. Bee keeping in India – Sardar Singh – KAR, Delhi.
2. Bee keeping in South India – Cherian M.C. & Ramachandran, Govt. Press, Chennai.
3. Handbook of Bee keeping – Sharma P.L & Singh S., Chandigarh.
4. Apiculture – J.Johnson and Jeyachandra, Martandam, Tamilnadu.

Semester III
PAPER 3.3.B CLINICAL BIOLOGY
(2 Hrs / Week)

UNIT I

Introduction- Normal and abnormal conditions of body – Symptoms – Samples to be collected for analysis – diagnosis – Instruments used in the analysis – sterilization

UNIT II

Urine Analysis-Collection and preservation of sample and chemical estimation. Protein, Urea, Glycemia sediments and casts, impaired renal function and clearance test

UNIT III

Estimation of Gastro intestinal contents-Saliva constituents, Collection and estimation of gastric juice, Secretion of liver, duodenal contents and pancreatic function tests.

UNIT IV

Clinical Haematology-Ways of obtaining blood, Haemoglobin estimation. Cell counting (DC / TC), Estimation of Erythrocyte sedimentation Test (ESR), Pathological, Physiological and hereditary disorders, Blood banking, Blood grouping and typing, Glucose Tolerance Test (GTT), impaired glucose tolerance test, Elisa test

UNIT V

Fertility Test - Semen analysis and Pregnancy test, RIA test- Agglutination test – Morphological variations – Types – Count and abnormalities.

Reference Books:

Medical Laboratory Techniques – R.Sood
Text book of preventive medicine – J.E. Park, Benansidar Bhalot
Introduction of Medical Laboratory Technology – Baker, F.J.Silverton
Medical Laboratory Technology – Lynch

SEMESTER IV PAPER 4.1 – GENETICS (4 Hrs/Week)

UNIT I

Mendelian inheritance patterns & Mendelian laws of heredity. Modification of Mendelism – Complete and incomplete dominance Codominance, complementary, supplementary, lethal genes in man. Interaction of genes Multiple alleles – A, B, O blood groups, Rh factors in man – Erythroblastosis foetalis. Multiple genes (Polygenic inheritance) – skin colour in man.

UNIT II

Linkage, crossingover,– Coupling & repulsion – mechanism of meiotic crossing over – Chromosome maps – linkage maps – Sex determination in Drosophila & Man – Sex chromosomes – Sex linked inheritance in man – Haemophilia, Colour blindness, hypertrichosis. Sex influenced genes, sex limited genes. Non disjunction in man – Detection of mutation by CLB method.

UNIT III

Human genetics – twins, human chromosomes, karyotypes, idiogram, simple Mendelian traits in man.
Inborn errors of metabolism – Phenylketonuria, Alkaptonuria, Albinism, Sickle – cell anaemia,
Chromosomal abnormalities – Autosomal & sex chromosomes – Syndromes in man (Klinefelter's syndrome, Turner's syndrome & Down's syndrome) Improvement of human race – Eugenics, Euthenics, Pedigree analysis Medical genetics – Genetics prognosis – Genetic counseling – family History – Preventive measures – Medico – legal aspects – Effect of drug on human heredity.

UNIT IV

Bacterial genetics – *E.coli* – Transformation of genetic material in bacteria & bacteriophage, conjugation, transduction, sexduction – genetic applications of bacteria – Identification of genetic material – Structure, lifecycle of bacteriophages – T4 phage – recombination of viruses, genetic applications of viruses. Mutation – Types of mutations – gene mutation – point mutation – chromosomal aberrations – genome mutation – mutagens – Ionising mutagens – Chemical mutagens.

UNIT V

Extra Chromosomal inheritance in Paramecium – maternal Predetermination in coiling shells. Population genetics – Gene Pool concept – Hardy – Weinberg Equilibrium – genes frequencies – calculation of gene frequencies in the population – factors affecting gene frequency – selection – mutation – drift & meiotic drive – migration. Animal breeding – Inbreeding and Out breeding – heterosis.

PRACTICALS

1. Observation of simple Mendelian traits in man – to be record.
2. Breeding experiments : to be illustrated with beads a) Monohybrid and b) Dihybrid – Chisquare test.
3. Observation and study of polygenic inheritance of quantitative traits to be interpreted in graphs:- a. Height of student b. Weight of students c. Length of shells. d. Length of pods.
4. Blood group to be analyzed in a population with a minimum of 30 students.
5. Models of genetic significance to be studied – syndromes, sex-linked inheritance (Colour blindness, hemophilia, hypertrichosis, webbed toes). Life cycle of *Drosophila*.

Reference Books:

1. Strickberger : Genetics (Mac Millan)
2. Farnsworth : Genetics (harper and Row)
3. P.K. Gupta: Genetics (Rastogi Publications)
4. P.S. Verma and Agarwal: Genetics (S. Chand & Co. Ltd.)
5. Altonburg, E.: Genetics (Oxford & IBH publishing Company)
6. Burns G.W.: The Science of Genetics (Mac Millan)
7. A.C. Pai: Foundations of Genetics (McGraw – Hill)
8. J.A. Serra: Modern Genetics (3 volumes)
9. Sinnot, Dunn and Dobzhansky: Principles of Genetics (McGraw-Hill)
10. Gardner: Principles of Genetics.

SEMESTER IV
PAPER 4.2.A
BIOPHYSICS & BIOINSTRUMENTATION
SKILL BASED SUBJECTS
(any one)
(4Hrs. /Week)

UNIT I

Biophysics- Scope and method- Atoms- molecules- molecular interactions-
Chemical bonds- Primary chemical bonds- Secondary chemical bonds
Principles of Thermodynamics- Laws of thermodynamics- enthalpy-entropy- living systems and energy changes

UNIT II

Bioenergetics- Energy and work- energy transformation- ATP – Bioenergetics-
Structure of ATP – formation of ATP – NADP –Structure- NADP/NADPH redox couple- Mitochondrial bioenergetics-Chloroplast bioenergetics.
Membrane Conductivity - Diffusion- Active transport- Osmosis- Electric conductivity

UNIT III

Photobiology- Nature of light and its properties – absorption and emission spectra – action spectrum, refractive index- Huygen's principle- polarized light- solar radiation- -UV- Infrared- De- excitation- Bioluminescence-Fluorescence- Phosphorescence

UNIT IV

Instrumentation—Microscopy- Principle and application of Electron microscope
Basic Instruments- Principle and applications of pH meter, and Colorimeter
Centrifugation- Principle and Types-, Chromatography- Principle - types- Paper, Ion exchange, HPLC and applications

UNIT V

Labeling Techniques: Isotopes , Radioactivity, radioactive decay , half- life, autoradiography, biological use of radioactivity Radioactivity Counter- Principle- types- Geiger Muller –Scintillation Counter
Electrophoresis- Principle –types - Agarose Gel electrophoresis, Polyacrylamide gel- Sodium Dodecyl Sulphate Polyacrylamide gel- applications
PCR Technology: Working mechanism of PCR
Gel Doc. - Principle- working mechanism- Lyophiliser- Principle- working mechanism- applications.

Reference Books :

1. Saleel Bose : Elements of Biophysics.
2. Casey : Biophysics – Concepts & Mechanism
3. Vasantha Pattabhi N. Gautham: (Narosa publishing House) – Biophysics.
4. Jeyaraman, K. : Laboratory Manual in Biochemistry. New Age International Publishers,
5. Kalaichelvan, P.T: A Laboratory Manual, MJP Publishers, 47, Nallathambi Street, Triplicane , Chennai 600005.
6. Gurumani, N: Research Methodology for Biological Sciences. MJP 47, Nallathambi Street, Triplicane , Chennai 600005.

7. Palanivelu , P. Analytical Biochemistry and Separation Techniques. A laboratory Manual for B.Sc and M.Sc Students. Department of Molecular Biology, M.K.University, Madurai-625021.
8. L. Veerakumari , Bioinstrumentation MJP Publishers, 47, Nallathambi Street, Triplicane , Chennai 600005

SEMESTER IV
PAPER 4.3B VERMITECHNOLOGY
SKILL BASED SUBJECT (4Hrs. /week)

UNIT I

Earthworm taxonomy- Morphological and anatomical- classification of earthworms-Food habits- Digestive system- excretion- reproduction and life cycle- earthworm as farmer's friend

UNIT II

Types of earthworms- exotic and native species- South Indian and North Indian species used in vermicomposting- Collection and preservation of earthworms for vermicomposting- Culture techniques of earthworms

UNIT III

Vermicompost production- Requirements-Different methods of vermicomposting- Heap method- Pot method and Tray method—Changes during Vermicomposting

UNIT IV

Role of earthworms in soil fertility- Use of vermicompost for crop production- use of earthworms in land improvement and land reclamation- Economics of vermicompost and vermivash production

Earthworms as animal feed-Medicinal value of earthworm meal – Role of earthworms in solid waste, sewage and faecal waste management and vermifilters

Earthworms as bioreactors

UNIT V

Interaction of earthworms with other organisms- Influence of chemical inputs on earthworm activities- Large scale manufacture of Vermicompost, packaging of vermicompost and its marketing- Financial supporting- government and NGOs for vermiculture work.

Reference Books :

1. Invertebrate Zoology – Ekambaranatha Ayyar
2. Earthworm in Agriculture – S.C. Talashikar and Dosani, Agrobios Publications, Near Nasarani Cinema , Jodhpur, 342002.
3. Vermicompost for sustainable Agriculture – P.K. Gupta Agrobios 2nd edition
4. Organic Farming for sustainable agriculture – A.K.Dahama, Agrobios.
5. A hand book of organic farming – A.K.Sharma. Agrobios publication
6. Earthworm ecology – Clive A.Edwards St.Lucie press – CRC Press Washington DC.
7. Biology of Earthworm – Edward and Lofti – Chapman and Hall Publication.
8. Vermicology – Sultan A. Ismail – Orient Longman Press.
9. Vermi Culture Biotechnology – U.S. Bhawalkar BERI, PUNE.

Semester IV
PAPER 4.3A PUBLIC HEALTH AND HYGIENE
(Non Major Elective)
(2 Hrs/week)

Unit – I

Physical, mental, social - positive health - Quality of life Index.
Nutrition and health - food hygiene - Food toxicants.
Population explosion in India - Birth control measures.

Unit –II

Environment and health - water -Sources of water - Uses of water
water borne diseases – Cholera - Ascariasis
Standards of Housing - Ventilation

Unit – III

Excreta disposal - Importance - Methods of excreta disposal. .
Sanitary health measures during fares and festivals.
First aid with reference to accident.

Unit – IV

Communicable disease - Viral diseases - , AIDS, Rabies.
Bacterial diseases - Tuberculosis, Typhoid.
Protozoan diseases - amoebiasis,
Helminth diseases - Filariasis,

Unit – V

Health situation in India - Health problems - Primary health care in India - PHC -
National Programmes - national AIDS control - National Malaria Eradication programme
- National Tuberculosis

Reference Books:

1. Anderson R. Clifford. Your Guide to Health
2. Basu, S.C. Preventive and Social Medicine
3. Goel, S.O.L. Public Health Administration.
4. Harold Shoryock and Hubert O. Swartout. You and your Health illustrated Dealing with Diseases.
5. Park, K. Park's Text Book of Preventive and Social Medicine. Banarsidas Bhanot Publishers, 1167 Prem Nagar, Jabalpur – 482 001.
6. Ramarao, V. First Aid in accidents. Sri Krishna brothers, Thambu Chetty Street, Chennai.
7. Sanitarians Hand Book. Theory and Administrative Practice. Pearles Publications, New Orleans, USA

SEMESTER IV
PAPER 4.3.B
COMMUNITY AND SOCIAL PREVENTIVE MEDICINE
(Non Major Elective)
(2 hrs/week)

Unit – I

Community and Health

Meaning and concept - Biomedical, Ecological, psychological, social and holistic. Determinants of health & Indicators of health. Concept of community health, Role of primary health centers.

Unit –II

Drug Addiction:

In India today - incidence among college students - common drugs in vogue - their side effects, control and management of drug addiction.

Alcoholism:

Its effect on various organs like heart, lungs, liver, pancreas, brain and intestine - chronic alcoholism - alcoholic withdrawal syndrome - its control and treatment.

Unit – III

Sexually transmitted diseases

Gonorrhoea - Syphilis - AIDS - causative agent, causes - symptoms - diagnosis - treatment and control measures.

Unit – IV

Child abuse

Definition - causes - effects - Legal measures for eradication.

Unit – V

Problems of old age:

Concept of ageing. Housing and health care of the aged. Problems - Cardiovascular - alimentary - Locomotion and joints - welfare service provided to the aged by the Government

PRACTICALS:

1. Simple staining of bacteria.
2. Gram staining of bacteria.
3. Visit to primary health centres.
4. Health survey report of a rural community.
5. Museum specimens, slides, models and charts - *Treponema pallidum*, *Neisseria gonorrhoeae*, AIDS virus, Liver cirrhosis and illustrations related to theory syllabus.

Reference Books:

1. Social Problems in India – Ram Akuja
2. Social Preventive Medicine – Park & Park
3. Ageing and Aged – Paul Chowthry
4. Indian Social Problem – G.R.Madan

SEMESTER V
PAPER 5.1 – ANIMAL PHYSIOLOGY AND BIOCHEMISTRY
(4 Hrs./Week)

Objective

Carving an integrated approach to chemistry related to the functional significance of the various organs and organ systems of animals.

UNIT I

- ❖ Introduction – Animal physiology and Biochemistry
- ❖ Carbohydrates – Classification – Structure and functions of glucose, fructose, sucrose and glycogen
- ❖ Proteins – Classification – Structure and function of albumin and glyco proteins
- ❖ General structure of amino acids – essential, non essential amino acids.
- ❖ Lipids – Classification – Structure and functions of lecithin, Cephalin, glycol lipids and cholesterol
- ❖ Prostaglandins – Introduction – Structure – Classification – Functions.

UNIT II

- ❖ Enzymes – Classification – Nomenclature and Properties – Mechanism of enzyme action.
- ❖ Digestion – Role of enzymes in carbohydrate, protein and fat digestion in man absorption of digested food materials in man.
- ❖ Metabolism – Carbohydrates – Glycogenesis – Kreb's cycle – Electron transport system.
- ❖ Proteins – Deamination – Transamination – Urea cycle
- ❖ Lipids – B-oxidation.

UNIT III

- ❖ Respiration – respiratory pigments – Distribution – Composition – Properties – Functions – Transport and exchange of oxygen and carbon-di-oxide – Anaerobiosis – Respiratory Quotient.
- ❖ Circulation – Origin and conduction of heart beat – Cardiac rhythm, cardiac cycle – ECG – Blood pressure – Heart diseases.
- ❖ Excretion – Kinds of excretory products – Nephron – Mechanism of urine formation in man – Composition of urine – Dialysis – Nephritis – Blood urea.

UNIT IV

- ❖ Muscle physiology – Ultra structure of skeletal muscle – Properties – Mechanism of muscle contraction – Tetanus – Muscle fatigue.
- ❖ Nerve physiology – Structure and types of neuron.
- ❖ Nerve impulse – Definition – Conduction of nerve impulse through nerve – Saltatory conduction – Synapse – Synaptic transmission of impulses – Neurotransmitters – Neuromuscular junction.

UNIT V

- ❖ Endocrine system – Pituitary, thyroid, Parathyroid, Adrenal Islets of Langerhans – Testis Ovary.
- ❖ menstrual cycle – The role of Hormones – Menopause – Pregnancy – Lactation.
- ❖ Bioluminescence – Definitions – Types – Chemistry – Adaptive significance.

PRACTICALS

1. Rate of Oxygen consumption in a fish.
2. effect of temperature on the opercular movement of fish – Calculation of Q₁₀.
3. Qualitative test for carbohydrate (glucose), protein and lipid
4. Demonstration of blood pressure using sphygmomanometer.
5. Estimation of haemoglobin – demonstration only.
6. Action of salivary amylase in relation to enzyme concentration.
7. Action of salivary amylase in relation to temperature.
8. Counting of different kinds of blood cells using haemocytometer – demonstration only.
9. Slides, models and charts – Glucose, Fructose, Glycogen, Sucrose, Aminoacid, Cholesterol, Intestinal Villi, Haemoglobin, ECG, Sphygmomanometer, Haemometer, Haemocytometer, Kymograph, Cardiac Muscle, Striated and Non- Striated Muscle, Simple Muscle Twitch.

Reference Books

1. Agarwal, R.A, A.K. Srivastava and Kaushal Kumar. Animal Physiology and Biochemistry (3rd Edition). S. Chand & Company Limited, New Delhi.
2. Arora, M.P. Animal Physiology (6th Edition) Himalaya Publishing House, Ramdoot, Dr. Bhalerao Marg, Girgaon, Mumbai.
3. Berry, A. K. A Text Book of Animal Physiology with related Biochemistry (6th Edition). EMKAY Publications, Post Box No. 9410. B – 19 East Krishna Nayar, Swami Dayanad Marg, Delhi.
4. Das, A.K. Medical Physiology, Vol. I and Vol. II. Books and Allied (P) Limited, No. 1 E/2 Shubam Plaza (1st Floor), 83/1 Beliaghata Main Road, Kolkata.
5. Goyal, K.A. and K.V. Sastry, Animal Physiology, 6th Revised Edition, Rastogi Publication, Gangotri, Shivaji Road, Meerut.
6. Hill. Animal Physiology, ANE Books India, Anantika Niwas, 19 Doraiswamy Road, T. Nagar, Chennai.
7. Juneja, Kavita, Animal Physiology. Anmol Publications Private Limited, 4374/4B Ansari Road, Daryaganj. New Delhi.
8. Nagabhushanam, R . M.S. Kodarkar and R. Sarogini. Text Book of Animal Physiology 2nd Edition. Oxford & IBH Publishing Company Private Limited, S – 155, Panchshila Park, New Delhi.
9. Nigam, H.C. Animal Physiology. Vishal Publishing Company, Books Market Old Railway Road, Jalandhaar.
10. Prosser, L. and A. Brown Comparative Animal Physiology. Saunders & Co. Philadelphia.
11. William, S. Hoar, General and Comparative Physiology. Prentice – Hall of India, M – 97 Connaught Circus, New Delhi.

Reference Books: Bio Chemistry

1. Agarwal, G.R. Kriran Agarwal and O.P. Agerwal, Text Book of Biochemistry (Physiological Chrmistry), Krishna Prakashan Media (P) Limite, 11 Shivaji Road, Meerut.
2. Berry, A.K. A Text Book of Biochemistry. EMKAY Publications, Post Box No. 9410, B – 19 East Krishna Nagar, Swamy Dayanand Marg, Delhi.
3. Deb, A.C. Concepts of Biochemistry (Theory + Practical). Books and Allied (P) Limited, No1 – E/1, SHUBHAM PLAZA (1st Floor) 83/1, Kolkata.
4. Deb A.C. Fundamentals of Biochemistry. New Central Book Agency (P) Limited, 8/1, Chintamoni Das Lane, Kolkata.
5. Jain, J.L, Sanjay Jain and Nitin Jain, Fundamentals of Biochemistry (6th Edition). S, Chand & Company Limited, 7361 Ram Nagar, New Delhi.
6. Jeyaraman, K. Laboratory Manual in Biochemistry, New Age International Publishers, 4835/24 Ansari Road, Darya Ganj, New Delhi.
7. Power and Chatwal. Biochemistry. Himalaya Publishing House, Ramdoot, Dr. Bhalerao Marg, Giragaon, Mumbai.
8. Rastogi, S.C. Biochemistry. Tata Mc Graw Hill Publishing Company Limited, No.444/1 Sri Emabara Naicker Industrial Estate, Alapakkam, Porur, Chennai.
9. Satyanarayana, U. Biochemistry. Books and Allied (P) Limited, No1 –E/1, SHUBHAM PLAZA (1st Floor) 83/1, Kolkata.
10. Satyanayana U. Biochemistry. Books and Allied (P) Limited, NO1 –E/1, SHUBHAM PLAZA (1st Floor) 83/1, Kolkata.
11. Weil, J.H. General Biochemistry, New Age International Publishers, 4835/24 Ansari Road, Darya Ganj, New Delhi.

Semester V PAPER 5.2 ANIMAL BIOTECNOLOGY (4 Hrs/Week)

Unit – I

Origin, History, Scope and importance biotechnology Basic concepts of Genetic Engineering, REstriction enzymes and modification systems.

Cloning Vectors : Bacterial plasmid vector (pBR322, plasmid); Bacteriophage vector (Lambda and M13) Plant Viral Vector Animal Viral Vector (SV40).

Unit - II

Gene Cloning : DNA library, Integration of DNA fragments into the vector, Introduction of recombinant gene into the host cells – Prokaryotic cells (Transformation, Liposome mediated gene transfer, Electrophoration, Particle bombardment gun); **Screening** (Selection) of recombinants – (Direct selection, Insertion selection and Blue – While selection) **Hybridization technique** – Blotting techniques (Southern, Northern, Western)

Unit – III

Animal Cell and Tissue Culture : Introduction and history

Cell types : Cell types selection; Requirements for animal cell culture – Substrate, liquid media and gases;

Cell culture techniques : cell culture initiation preparation, sterilization of substrates, media, Isolation of explants – disaggregation of explants; subculture and prevention of contamination.

Cell lines : Evolution of cell lines and their maintenance; large scale culture of cell lines monolayer culture.

Unit – IV

Organ culture : Techniques, advantages, applications and limitations Animal (Somatic) cell fusion.

Hybridoma Technology and monoclonal antibody production **Stem cell culture** : Embryonic stem cell culture, Methods to produce differentiated cells, application of stem cells, their maintenance their characteristics and Human embryonic stem cell research **DNA sequencing**: Molecular markers and their applications (RFLP, RAPD) Animal bioreactors and Artificial skin.

Unit – V

Transgenic Animal Technology: Introduction and importance of transgenesis. Dolly, Applications of transgenic animals. Gene knockout **Bioethics** : Bio safety and Patenting of Biotech products **Genomics** : Introduction, Genomic Sequencing projects, Types of genomics and methods of gene sequencing.

Reference books:

1. Prof. V. Kumaresan, “Animal Biotechnology”, Saras Publication, 114/35G A.R.P Camp Road, Periyavilai, Kattar P.O., Nagercoil, Kanyakumari -629 002.

2. Kumar H.D. “A text Book of Biotechnology, Affiliated East-West Press(P) Ltd., New Delhi.

3. Animal Biotechnology, 2006, R. Sasidhara, MJP Publishers, Chennai.

4. Animal Biotechnology – Recent Concepts and Developments, 2008, P. Ramadass, MJP Publishers, Chennai.

PRACTICALS

1. Isolation of genomic DNA – Demonstration.

2. Protein estimation – Quantitative method – Demonstration (Lowry method)

3. MODELS, CHARTS AND PHOTOS

pBR322, plasmid, Lambda Phage, Recombinant DNA, Gene cloning, Southern blotting, Stem cells, RFLP, Dolly, Transgenesis, Animal cloning.

SEMESTER V
ELECTIVE: (ANY ONE)
PAPER: 5.4A SERICULTURE
(5 Hrs./Week)

OBJECTIVE

To explore the scope for students adopting sericulture as a vocation after their graduation as it is rural based and welfare oriented agro based industry.

UNIT I

Importance of sericulture, sericulture industry in India, sericulture as cottage industry, role of Central Silk Board, Moriculture, Mulberry varieties – High yielding varieties – Varieties for rainfed conditions. Morphology of mulberry plant, methods of propagation, irrigation, manuring – Biofertilizers – Green manuring – Triaccontanol for increased mulberry productivity – Seriboost, pruning, harvesting and storing of mulberry leaves, package of practices for mulberry cultivation.

UNIT II

Diseases of mulberry – fungal diseases – fungal root diseases, fungal shoot diseases, Bacterial diseases – leaf blight disease, rot disease, Neematode disease – root knot disease, Deficiency diseases – nitrogen deficiency, phosphorus deficiency, potassium deficiency, Pests of mulberry – leaf eating insect pests and borer pests one example each.

UNIT III

Classification of mulberry silkworm, habit and habitats of silkworm, voltinism, races of silkworms, life cycle of mulberry silkworms, structure of egg, larva, pupa and adult, sexual dimorphism, digestive system, circulatory system, excretory system, respiratory system, nervous system and reproductive system, endocrine glands, glands of silkworm.

UNIT IV

Rearing of Silkworm : Rearing house – Rearing appliances – Rearing operation – Disinfection – Brushing – Maintenance of optimum conditions, Feeding – bed – cleaning – spacing. Rearing of young ages – Chawki rearing – Rearing of late age larva: shelf rearing. Floor rearing, shoot rearing. Application of sampoorna, Mounting : Methods – precautions, Cocoon marketing. Characteristics of cocoons – defective cocoons – methods of harvesting.

UNIT V

Diseases of silkworms; Protozoan – pebrine, Viral – Flacherie, grasserie, Bacterial – Flacherie, septicemia, Fungal – Muscardine, Pests – Uzi fly, of silkworm, Silk reeling : cocoon stifling – types, storage of stifled cocoons, sorting, cocoon boiling and deflossing – brushing, Process of reeling: Different methods, Silk waste and byproducts of silk reeling. Raw silk and marketing.

PRACTICALS

1. Dissection of silk glands, digestive and systems.
2. Dissection of male and female reproductive system.

3. Selection of mulberry leaves according to different stages.
4. Life history – egg, larva, pupa and adult.
5. Sexual dimorphism in pupa and adult.
6. Mulberry such as MR2, V2.
7. Chandrike
8. Rearing tray and rearing stand.
9. Raw silk
10. Report on field visit to sericulture farm.

Reference Books

1. Ganga, G. and I. Sulochana Chetty, An introduction to Sericulture. Oxford & IBH Publishing Company Private Limited, S – 155, Panchshila Park, New Delhi.
2. Ganga, G. Comprehensive sericulture, Volume – 2 Silkworm Rearing and Silk Reeling. Oxford & IBH Publishing Company Private Limited, S-155, Panchshila Park, New Delhi.
3. Ganga, G. Comprehensive sericulture, Volume – 2 Silkworm Rearing and Silk Reeling. Oxford & IBH Publishing Company Private Limited, S-155, Panchshila Park, New Delhi.
4. Dandin, S.B, Jayant Jayaswal and K. Giridhas, Hand Book of Sericultural Technologies, Central Silk Board, madivala, Bangalore – 68.
5. Kamile Afifa, S. and Masoodi M. Amin, Principles of Temperate Sericulture, Kalyani Publishers, B-1/1292, Rajinder Nagar, Ludhians.
6. Kesary, M. and M. Johnson, Sericulture, Department of Zoology, N.M. Christian College, Marthandam.

SEMESTER V **PAPER 5.4.B. ECONOMIC ENTOMOLOGY** **(5 Hrs/ Week)**

UNIT I

A general introduction to the study of Entomolgy with special reference to insect development & metamorphosis.

A general knowledge of insect classification with a stress on the economic importance on families & members of the following orders:

(Thysanura, Orthoptera, Dycptoptera, Odonata, Thysanoptera, Isoptera, Anapleura, Coleoptera, Lepidopters, Hemipters, Diptera & Hymenoptera).

UNIT II

Beneficial insects : A general knowledge of Apiculture, Sericulture & Lac culture.

UNIT III

Helpful insects : Scavangers, Pollinators, Predators & Parasites effecting biological control.

UNIT IV

Principles & methods of Pest control : Physical, Chemical, mechanical, biological & Legislative methods & recent integrated control methods. Pesticides & their classification. Principles & Application of pesticides – dusting, Praying, aerosol & aerial spraying, Insecticide appliances – dusters & sprayers Information regarding safe use of pesticides & antidotes for pesticide poisoning.

UNIT V

Medical Entomology: Household & disease carrying insects & transmitters, vectors & their control methods.

PRACTICALS

1. Study of the distinguishing characters of the insects belonging to various orders mentioned in the theory syllabus (Figures & notes).
2. Collection, Observation & Recording of nymphs of insects.
Elementary knowledge about Bee keeping, sericultures, Lac cultures – methods & appliances.
3. Methods of collection & preservation of insects.
4. Collection, preservation & submission of insects representing 10 different orders mentioned in the theory syllabus.
5. Study of common pesticides & their formulations – preparation of pesticides & familiarizing with different systems of application of pesticides in the field.

Reference Books:

1. T. V. Ramakrishnan Iyer : Handbook of Economic Entomology for south India.
2. Agricultural insect pests of the tropics & their control (Dennis hill, 1975).
3. Matcalf. Flint & Matcalf : Destructive & useful insects (IV edition).
4. Agricultural Entomology (ICAR, New Delhi).
5. Insects – The year book of Agriculture (United States Department of Agriculture).
6. Little : Elements of Entomology.
7. Davison & Pears : Insect pests of farm, garden & orchard.
8. Vasanth Rqaj David : Textbook of Economic Entomology.
9. Paul Debach : Biological control of natural enemies.
9. Wigglesworth : Physiology of Metamorphosis.
10. A.D. Imms : Outlines of entomology.
11. Ross : A textbook of Entomology.
12. N.P. Kalyanam : Common insects of India.
13. M.S. Moni : Textbook of Entomology

SEMESTER V
PAPER 5.4.C. DAIRY FARMING
(5 Hrs/ Week)

UNIT I

Importance of the study- Live stock in India- Live stock reproduction- Organs- Fertilization- Artificial insemination- Inheritance- Hybrids- Hybrid vigor- Grading- Pure breeds- Inbreeding

UNIT II

Nutrition- Nutritive values of common feeds- Commercial and mixed feeds- Balance ration

UNIT III

Dairy animals- Cattle- Cow- Buffaloes- Goat- Their economic importance- Productivity

UNIT IV

Live stock diseases- Common parasites in India- Treatment

UNIT V

Marketing the dairy products- Milk and other dairy products- Nutritive values of fresh and preserved products- Combating spoilage of milk- souring- gassy curdling- robiness- sweet curdling- pasteurization

PRACTICALS:

1. Visit to pasteurization plant and reporting.
2. On the spot tests of pure milk- specific gravity, total solids and adulteration of milk
4. Demonstration of dairy products- cream, butter, ghee, khoa, and ice cream
5. Identification of cattle diseases- prevention and cure- method of taking temperature in cows.
6. Preparation of cattle feed- balanced food- identification of different feed plants
7. Artificial insemination- common surgical instruments and their uses.
8. Periodical visit to a good Dairy Farm and reporting.

Reference books:

1. Principles of Dairy Chemistry. Janness, Robert and Sturte Patton; Wiely Eastern
2. Artificial insemination in Farm animals: Perry Enos (Eds.) Oxford & IBH
3. Breeding and improvement of Farm animals: Rice, Victor, Arthur; Tata MC Graw Hill.
4. Livestock and Poultry production: Singh, Herbans and Earl Moore; Prentice Hall in India

SEMESTER V
ELECTIVE: (ANY ONE)
PAPER 5.5.A. APICULTURE
(5 Hrs./Week)

Objective: To examine the scope for self employment opportunities after their graduation on account of the rural based and welfare oriented nature of this vocation.

UNIT I

Definition, Scope, classification of bees – Rock bee, Indian bee, Little bee and Dammer bee – their identification and habits – choice of species in Apiculture.

Bee colony – Distinctive features and identification of queen, drones and workers, functions of the members. Legs, mouth parts and sting of worker bee.

Development of Honey bee – egg, larva and pupa – time taken for the development of queen, drone and worker. Food of the bee – honey and pollen –royal jelly,propolis.

Artificial feeding. Behaviour of bees – dances

UNIT II

Principles of Apiculture, Arranging an apiary , position-space-direction, acquiring bees-care of newly captured colonies-handling the bees.

Bee keeping -Primitive methods - modern methods. The bee comb and its architecture-different kinds of cells-Burs comb.

Different types of hives-their identification, artificial hives-their advantages-Hive architecture -parts of artificial hive-other appliances used in apiaries.

UNIT III

Honey bee products.

Honey - Extraction of honey - Preservation and storage of honey - properties, chemical composition, nutritive value, medicinal values -honey as daily food.

Bee wax-production-method of extraction-characteristics and uses.

Bee venom-methods of extraction of venom-composition of venom – curative value.

UNIT IV

Enemies of bees-Greater wax moth, lesser wax moth, ants, wasps, lice, beetles and birds and their control.

Diseases of bees-adult and brood diseases-prevention and control measures.

UNIT V

Swarming-Prevention and control

Robbing and Fighting-Prevention and control

Uniting stocks – different methods

Queen rearing

Supersedure

Foraging Inter-relationships of plants and bees

PRACTICALS

1. Identification of worker, queen and drone
2. Mountings of legs, mouth parts and sting
3. Artificial hive and its parts
4. Apiary-appliances used
5. Report on field visit to Apiary

Reference Books

1. Abrol, D.P. Bees and Bee keeping in India. Kalyani Publishers, B- 1/1292, Rajinder Nagar, Ludhiana-141 008.
2. Abrol, D.P. Honey bee Diseases and their Management. Kalyani Publishers-B-1/1292, Rajinder Nagar, Ludhiana-141 008.
3. Bee keeping in South India. Superintendent, Govt. Press, Chennai
4. Cherian, M.C. and Ramachandran. Bee keeping in South India.
5. Johnson, J. and I. Jeya Chandra. Apiculture. Department of Zoology, N.M. Christian College, Marthandam-629 165.
6. Mishra, R.C. and R. Garg. Perspectives in Indian Apiculture. Agrobios (India) Behind Nasrani Cinema, Chopasani Road. Jodhpur-342 002.
7. Philips, E.F., Beekeeping, Agrobios (India) Behind Nasrani Cinema, Chopasani Road, Jodhpur-342 002.
8. Sardar Singh. Bee keeping in India. Kar Delhi
9. Sharma P.L and Singh, S. (Controller) Hand book of bee keeping. Printing and Stationery, Chandigarh
10. Webb, A., Beekeeping for Profit and Pleasure. Agrobios (India), Behind Nasrani Cinema, Chopasani Road. Jodhpur-342 002

SEMESTER V PAPER 5.5.B FOOD AND FOOD PROCESSING TECHNOLOGY (5 Hrs/ Week)

To understand the physical and chemical properties of food stuff, the methods of preparation of palatable diets and the techniques employed to increase their shelf-life.

UNIT I: FOOD CHEMISTRY

Food chemistry: Definition and importance, water in food, water activity and shelf life of food. Carbohydrates: Chemical reactions, functional properties of sugars and polysaccharides in foods. Lipids: Classification, and use of lipids in foods, physical and chemical properties, effects of processing on functional properties and nutritive value. Protein and amino acids: Physical and chemical properties, distribution, amount and functions of proteins in foods, functional properties. Effect of processing - Losses of vitamins and minerals due to processing. Pigments in food, food flavours, browning reaction in foods. Enzymes in foods and food industry, bio-deterioration of foods, food contaminants, additives and toxicants.

UNIT II: PRINCIPLES OF FOOD PROCESSING

Scope and . importance of food processing. National and international perspectives. Principles and methods of food preservation - freezing, heating, dehydration, canning, additives, fermentation, irradiation, extrusion cooking, hydrostatic pressure-cooking, dielectric heating, microwave processing, aseptic processing, hurdle technology.

Storage of food, modified atmosphere packaging, Refrigeration, freezing and drying of food, minimal processing, radiation processing.

UNIT III

Definition of milk, composition, physical and chemical properties of. Milk .constituents and nutritive value of milk, factors affecting composition of milk, types of milk

Fluid Milk Processing

Receiving, Filtration and, .clarification, straining, standardization, homogenization and its effects. .

Pasteurization and various systems of Pasteurization; LTLT, HTST, UHT methods, Pasteurizes (Heating system, cooling system, flow controller regenerator, flow division valve) sterilization, packaging of fluid milk. Coagulated Milk Products

Channa, paneer, classification and manufacturing process of cheese -Manufacture and storage of butter and ghee.

Condensed Milk - Types and factors affecting the quality of condensed milk, storage of condensed milk - Methods of drying milk (Drum and Spray drying), factors affecting the quality of dry milk. Introduction to instant non-fat dry milk, packaging of dry milk products.

UNIT IV: FRUITS AND VEGETABLES TECHNOLOGY

Cleaning, sorting, grading, peeling and blanching methods and their Equipments, Ingredients and processes for the manufacture of: jam, jellies, marmalade, preserves, pickles and chutneys. Defects and factors affecting the quality of above.

Thermal Processing of Fruits and Vegetables: History, definition, various techniques of thermal processing and their effects on the quality of fruits and vegetable products, thermal process time, introduction to concept of thermal process calculations, types of containers and their selection, spoilage of canned foods.

Dehydration of fruits and vegetables, equipment and process for dehydration of plums, apricot, apple, fig, grapes, peach, cauliflower, potato, mushroom, Tomato.

Freezing process of selected fruits and vegetables: peas, beans, cauliflower, apricot, mushroom.

UNIT V: TECHNOLOGY OF MEAT, FISH AND POULTRY PRODUCTS

Slaughter of meat animals, different cuts of lamb and their uses, post-mortem inspection – post mortem changes – Loss of homeostasis, post-mortem glycolysis and pH decline, Rigor mortis Preparatory operations of meat and meat products: Abattoir – Definition and construction, basic preparatory procedures (commintion, emulsification, preblending) Cured and smoked meats, sausage products – classification, processing steps, and canned meat, meat pickles.

Handling and Dressing of poultry: Inspection of poultry birds, dressing and preparation of ready to cook poultry, factors affecting the quality – Egg and Egg products – structure, chemical composition and nutritive value, spoilage of eggs and preservation of whole egg

and egg products, preparation of egg powder. Fish and Fish products: Types of fish, composition and nutritive value, judging and freshness of fish, fish grading and cooking of fish, smoking, pickling, salting and dehydration, preservation of fish and processed fish products Frozen storage of fresh and processed meat, poultry and fish By-products of fresh and processed meat, fish, poultry and egg industry

PRACTICALS

1. Determination of protein, starch, sugar, amino acids , crude fibers, total minerals, crude fat in food stuff.
2. Estimation of vitamins- Ascorbic acid, thiamine
3. Browning reaction in food, analysis of lipid-saponification value, acid value & Iodine value.
4. Determination of tannins-chemical residues and aflatoxins, estimation of preservative and antioxidants.
5. Platform test of milk.
6. Determination of SNF, specific gravity and total solids of milk.
7. Determination of moisture and fat content of milk powder.
8. Determination of adulterants in milk like water, urea, neutralizes, preservatives and starch.
9. Preparation of channa and paneer.
10. Preparation of different types of milk products and their evaluations.
11. Preparation of fish, meat, egg and vegetable pickles-demonstration.
12. Estimation of iron sulphide formation in cooked egg.
13. Visit to a dairy Unit, different fruit and vegetable processing Unit, Slaughter house, and observation of different types of cuts made and demonstration of slaughtering, fish processing Unit and submit a report.
14. Equipments and appliances used in various food processing industries -observation.

Reference Books:

1. Food processing and nutrition- Bender A.E.- 1978 Academic Press, London
2. Food processing technology: Principles and Practices. Fellows, P. and Ellis, A. 1990. New York
3. Introduction to food processing- Jelen, P.-1985. Prentice Hall, Reston Virginia, USA.
4. Food Chemistry- Awrand, W. and Woods, A.E. 1973. AVI, Westport.
5. Food Chemistry - Meyer, L.H. -1973. East West Press Pvt. Ltd. New Delhi.
6. Outlines of Dietary technology- Woarnes
7. Preservation of fruits and vegetables- Vijayakhader Kalyani
8. Preservation of fruits and vegetables Srivastava, IBD Co. Lucknow.
9. Fish Preservation- S.K Kulshrestha
10. Fish processing and preservation- C.L.Cutting
11. Poultry , Meat and Egg products- Parkursh and Mountney. CBS Publishers
12. Processed meat- Pearson and Glite - CBS Publishers
13. Advanced Handbook of food and nutrition- Vol. I and II.- M. Swaminathan- Bangalore Printing and Publishing Co. Ltd., Bangalore.

SEMESTER V
PAPER 5.5.C.
POULTRY SCIENCE
(5 Hrs/ Week)

UNIT I

Poultry industry in India – a brief introduction.
Choosing a commercial laying stock - sexing in one day old chicks.
Poultry housing – general principles of building poultry house.
Deep litter system - Droppings pit – feeders, waterers – nest boxes.
Laying cages – Californian cages – management of cage birds.

UNIT II

Poultry manure – Volume, composition and values.
Nutritional content of eggs.
Management of chicks, growers, layers and broilers.
Lighting for chicks, growers, layers and broilers.
Summer and winter management.
Debeaking - Forced moulting

UNIT III

Poultry nutrition: Protein and amino acid requirements for chicks, growers, layers and broilers – Symptoms of excessive dietary levels and deficiency.
Carbohydrates and fat requirements for chicks, growers, layers and broilers – Symptoms of excessive dietary levels and deficiency.
Fibre requirement for poultry feeds.
Requirements of vitamins and inorganic minerals for chicks, growers and layers – deficiency symptoms.

UNIT IV

Importance of feed additives in a poultry feed.
Preparation of supplementary feed for poultry – South Indian feed ingredients in relation to M.E. level, protein level, amino acid level, minerals (Ca & P) and fiber content.

UNIT V

Poultry diseases - Causes, symptoms, transmission, treatment, prevention and control of the following diseases: Viral diseases- Ranikhet disease, Fowl pox, Infectious bronchitis and Gumboro disease. Bacterial disease- Fowl typhoid, Paratyphoid, Pullorum, Fowl Cholera, Coryza and Mycoplasmosis. Fungal diseases- Aspergillosis and Aflatoxicosis. Parasitic disease- Coccidiosis. Nematode infections. Tape worm infections. External parasites of chicks -Ticks, mites and lice.

PRACTICALS:

1. Identification of ectoparasites of poultry studied in the theory
2. Identification of endoparasites
3. Feeders- different types
4. Waterers- different types
5. Cage house- model

6. New castel disease, Fowl pox, Coryza, Coccidiosis-diagrams or models
7. Debeaking
8. Visit to a poultry farm and reporting.

References:

1. Poultry keeping – M.R. Gnanamani
2. The Rearing of Pullets – Bulletin No 54, Her majesty's stationary office, London.
3. Intensive poultry management for egg production. Bulletin No. 152. Her majesty's stationary office, London.
4. Nutrition of Chicken – M.L. Scott *et al.*,
5. Diseases of poultry – Biester Oxford & IBH.

SEMESTER VI
PAPER 6.1 APPLIED BIOTECHNOLOGY
(5 Hrs/week)

Unit – I

Environmental Biotechnology:

Water pollution: Biotechnological methods for Sewage and Waste water treatment - Primary treatment - Secondary treatment (Anaerobic digestion process and anaerobic filter) - Tertiary treatment (Ion exchange method)

Bioremediation: Definition -types, Microbial degradation of selected Xenobiotics (Hydrocarbon, Pesticides). Role of genetically engineered micro organisms in bioremediation (Plasmid transfer, Super bug).

Biomining, Bioleaching and Biofuels: An overview of the role of microbial technology and biomining, bioleaching and biofuel.

Unit –II

Agricultural Biotechnology: Basic technology for plant tissue culture (Callus and Explants culture) Production and application of single cell protein

Protoplast Fusion: Somatic hybridization and micropropagation techniques and their applications. Genetic manipulation of 'nif' gene and 'nod' gene of nitrogen fixation.

Aquaculture Technology: Application of Biotechnological tools (ELISA & PCR) for disease diagnosis.

Unit – III

Bioprocess / Fermentation Technology: Definition, Products of Commercial importance from Bio process technology.

Bioreactors: Principle, Design of conventional and Advanced types (Continuous stirred tank Bioreactors CSTB and Airlift bioreactors)..

Metabolite production: Primary metabolites - Ethanol production - secondary metabolites - Penicillin - Enzyme production - galactosidase.

Biotransformation: Definition, principle and biotransformation of ethanol.

Unit – IV

Enzyme Technology: Enzymes definition, nomenclature and properties.

Enzyme production: Microbial organisms and enzyme production Commercial production of microbial enzymes - technique - industrial application of microbial enzymes - enzyme

immobilization and their application. **Enzyme Biosensor:** Principle and types of biosensor - Applications of biosensor.

Unit – V

Human genome project: Introduction, objectives, principle, mapping methods and major contributions of Human genome project.

Gene therapy: Introduction, types of gene therapy, vectors used in gene therapy (viral vector) and gene therapy for cancer.

DNA applications: DNA probe - methods and mechanism - - DNA finger printing techniques and Application in forensic medicine.

DNA vaccines, Bio-weapons.

Reference books:

1. B.D Singh, "Biotechnology," Kalyani Publishers, No.1 Mahalakshmi street, T.Nagar, Chennai – 600 017.
2. C.Ratledge & B. Kristiansen "Basic Biotechnology" Cambridge University Press.
3. Prof. V. Kumaresan, "Animal Biotechnology", Saras Publication, 114/35G A.R.P Camp Road, Periavilai, Kattar P.O., Nagercoil, Kanyakumari -629 002.
4. Dubey R.C "A tex book of Biotechnology" S. Chand & Co., Ltd., New Delhi.

PRACTICALS

1. Estimation of BOD in sewage-Demonstration
 2. Protoplast preparation and Fusion-Demonstration
 3. Estimation of oxygen or carbon dioxide in any effluent/sewage-Individual
 4. MODELS, CHARTS, PHOTOS, AND SLIDES
- Anaerobic digester-Filter, biosensor, callus, explants, micropropagation, protoplast fusion, fermentor, enzyme(structure), Recombinant DNA, Human Genome Sequence, Penicillin(Structure), Rhizobium, Blue Green Algae(Nostoc) Azolla

SEMESTER VI PAPER 6.2 IMMUNOLOGY & MICROBIOLOGY (6Hrs/ Week)

UNIT I

History & Scope of Immunology.

Immunity – Types of immunity - Innate & acquired, passive & active.

Lymphoid organs – primary & secondary (Thymus, Bone marrow, Bursa of fabricius, Spleen, tonsil, lymph node, Peyer's patches).

UNIT II

Immunoglobulin – structure & function, biological properties of Ig classes.

Interaction of antigen & antibody.

UNIT III

Immune response – lymphocyte as unit of immune system, stem cells, T & B cells & macrophages.

Humoral immune response – primary & secondary responses – B cell activation.

Cell – mediated immune response – types of T cells & functions.

UNIT IV

Introduction : History & scope of microbiology.

General structure of microbes (Bacteria, virus).

Bacterial growth : culture media & selective media; continuous & batch culture techniques, growth curve.

UNIT V

Food microbiology : Food poisoning ; food spoilage & preservation.

Industrial microbiology : Production of Antibiotic penicillin.

Soil microbiology : Role of soil microbes in N₂ fixation.

Medical microbiology : Diseases caused by bacteria in Different systems of man as given below: Dermal – Streptococcal inflammation : – Tuberculosis; Gastro – intestinal – dysentery : Reproductive – Gonorrhoea.

Viral diseases with reference to causative organisms, symptoms, impact on the host & control measures, AIDS Rabies, Chicken pox, measles, Influenza & Polio.

PRACTICALS:

Immunology

1. Cleaning of glasswares; sterilizing media & equipments.
2. Preparation of culture media for microbes, Serial dilution techniques.
3. Distribution of microorganisms in nature-soil, water & air.
4. Aseptic transfer of microbes & pure culture of bacteria, preservation & maintenance of bacteria.
5. Preparation & fixing of bacteria for staining & simple staining of bacteria.
6. Gram- staining of bacterial.
7. Microscopic examination of living bacteria hanging drop method.
8. Microscopic counting of microbes using haemocytometer.
9. Measurement of microbes using ocular & stage micrometers (Demonstration only).

Reference Books:

Immunology

1. Roitt, I. : Essential Immunology (ELBS).
2. Kuby : Immunology (W.H. Freeman).

Microbiology

1. Pelczar, Reid & Chan : Microbiology.
2. Philip, L. Carpenter : Microbiology.
3. Powar : General Microbiology.
4. Salle, A.J : Fundamental Principles of Bacteriology.
5. Alexander, M : Introduction to soil Microbiology.
6. Frazier, A.C. & Westhoff, D.C : Food Microbiology.
7. Burrows : Text Book of Microbiology.

8. Lakshmanan, M : Laboratory manual in Microbiology.
9. Patel, A.H. : Industrial Microbiology (MC. Millan India).
10. Moat & Foster : Microbial Physiology.
11. Rangaswami, G : Diseases of crop plants in India.

SEMESTER VI
PAPER 6.3
BIO STATISTICS, COMPUTER APPLICATIONS AND BIOINFORMATICS
(6 Hrs/week)

Unit – I

Definition and Scope: Collection of Data – Sampling methods – Variables – Discrete and continuous – Presentation of Data – Classification and Tabulation : Parts of table. Diagrams and Graphs: Line diagrams – Bar Diagram – Pie diagrams – Histogram – Frequency polygon – Frequency poly curve. Measures of Central Tendency – Calculation of Mean, Mode and Median.

Unit –II

Measures of dispersion: Variance – Range – Standard Deviation and standard Error. Chi – Square test- Calculation and applications and students ‘t’ Test. Correlation : Introduction – Types – Perfect positive and negative, Linear and nonlinear – Methods – Scatter diagram, Karl Pearson’s correlation coefficient – Interpretation of the correlation coefficient.

Unit – III

Introduction to computer – what is computer – generation of computer – components of computer – input devices - output devices – CPU – Primary and Secondary Memory – operating system. Introduction to M.S. Office software covering word processing, spread sheet and presentation software. MS word basics: creating word document –editing- aligning – adding bullets, numbering and symbols – printing. MS excel –entering and editing cell entries – adjusting row and column height – Pie-bar-line chart preparation. Uses of internet - Email, Internet Browsing, Web.

Unit – IV

Bioinformatics: Introduction – Definition of Bioinformatics- History—Importance of Bioinformatics- Scope and application of bioinformatics—components of Bioinformatics-- Bioinformatics in life science. Biological sequence analysis – sequence alignment - pair wise sequence comparison – multiple sequence alignment.

Unit – V

Major Data bases in Bioinformatics – Nucleic acid sequence databases – EMBL – Genbank – Protein sequence database – SWISS-PROT. Databases Similarity Search Tools : BLAST FASTA – Application of bioinformatics tools. Database Retrieval Tools : ENTREZ – Locus link – Pub Med (Publishers on Medicine) SRS. Protein structure visualizing tools – RasMol, Swiss PDB viewer.

PRACTICALS:

1. Find out mean, median, mode, standard deviation, standard error and co-efficient of variance using neem leaf.
2. Calculation of correlation.
3. Bar diagram, histogram, pie diagram and frequency curve.
4. Models, Chart and photos : Computer Mouse, CPU, Keyboard, Monitor.
5. Visit to a computer centre to learn internet browsing and email sending – compulsory for each student.
6. Take printout from NCBI, EMBL and PubMed and keep it for spotters.
7. Write some of the file commands and keep for spotters.

Reference Books: Bio Statistics

1. Arora and Mathan. Bio Statistics (5th Edition). Himalaya Publishing House, Ramdoot, Dr. Bhalerao Marg, Girgaon, Mumbai – 400 004.
2. Gurumani.N, An Introduction to Biostatistics (Computer Applications included) 2nd Edition M.J.P. Publishers, Tamilnadu Book House, 47 Nallathambi Street, Triplicane – 600 005.
3. Jasra, P.K. and Gurdeef Raj. Biostatistics, Krishna Prakashan Media(P) Limited, 11, Shivahi Road, Meerut – 250 001.
4. Parihar and Parihar. Biostatistics and Biometry., Student Edition, Agrobios (India) Behind Nasrani Cinema, Chopasani Road, Hodhpur- 342 002.
5. Pagano, M. and K. Gauvreau. Principles of Biostatistics. Thomson Learning, Alps Building, Ist Floor, 56, Janpath, New Delhi.
6. Pranab Kumar Banerjee. Introduction to Biostatistics (2nd Edition). S. Chand & Company Limited, 7361, Ram nagar, new Delhi – 110 055.
7. Prasad, S. Elements of Biostatistics. Rastogi Publications, Gangotri, Shivaji Road, Meerut 250 002.
8. Daha, T.K. Biostatitics in Theory and Practics. EMKAY Publications, Post Box No . 9410, B-19, East AKrishna Nagar, Swami Dayanand Marg, Delhi – 110 051.
9. Satguru Prasad – Fundamentals of Biostatistics (Biometry). EMKAY Publications, Post Box No . 9410, B-19, East AKrishna Nagar, Swami Dayanand Marg, Delhi – 110 051.
10. Satgurau Prasad, Elements of Biostatistics, Rastogi Publications Gangotri, Shivaji Road, Meerut 250 002.

Computer Applications:

1. Krishnamoorthy, R. Computer Programming and applications.
2. Rajaram, V. Fundamentals of computers.

Bioinformatics.

1. Bal, H.P. Bioinformatics Principles and Applications, Tata Mc Graw Hill Publishing Company Limited, No. 444/1 Sri Ekambara Naicker Industrial Estate, Alkapakkam, Porur, Chennai- 600 116
2. Dan, E. Krane and Michael L. Raymer. Fundamental concepts of Bioinformatics. Pearson Education (Singapore) PTE Limited, Indian Branch, 482 FIE Patparganj, Delhi – 110 092.
3. Ignacimuthu, S. Basic Bioinformatics. Narosa Publishing House Private Limited, 35-36 Greams Road, Thousand Lights, Chennai – 600 006.
4. Ranga, M.M. Bioinformatics, Agrobios (India) Behind Nasrani Cinema, Chopasani Road, Hodhpur- 342 002.
5. C.S.V. Murthy: Bioinformatics- Himalaya Publishing House.

SEMESTER VI
ELECTIVE: (any one)
PAPER 6.4.A. AQUACULTURE
(5 Hrs./Week)

Objective: To illustrate Aquacultural potential and practices in India and augment food production from aquatic resources through Aquaculture.

UNIT I :

Definition, Scope of aquaculture, cultural techniques, Aquaculture in India – Freshwater, Coastal and marine aquaculture - Culturable organisms- fin fishes, shell fishes and their qualities.

UNIT II :

Preparation of pond for fish culture.

Types of fish ponds - nursery pond, rearing pond and culture pond.

Fin fish culture – Culture of Indian major carp- bundh breeding, induced breeding, transport of fish seeds.

Shell fish culture- culture of marine prawn- induced breeding – types of prawn culture in India.

Edible Oyster culture

UNIT III:

Types of cultures - Extensive, Semi-intensive and Intensive culture, Monoculture, Monosex culture, Polyculture, Cage culture, Pen culture. Integrated fish farming - Paddy cum fish culture. Animal husbandary cum fish culture, Sewage fed fish culture.

UNIT IV:

Fish feed - Artificial feed - Feed formulation, need, ingredients, pellets.

Live feeds and their culture - Artemia, Diatoms, Rotifers, Micro algae

Diseases of aquaculture organisms - Ectoparasites and Endoparasites. Bacterial, Viral and Fungal diseases - Nutritional deficiency diseases.

UNIT V:

Government participation in aquaculture. CMFRI, CIFRI, MPEDA, FFDA. Post harvest technology in fishes- Rigor mortis, fish spoilage, fish preservation techniques – freezing, canning, drying. Fish marketing; Co-operative marketing in fisheries. Crafts and gears. Water quality management.

PRACTICALS

1. Determination of pH in two water samples using pH meter.
2. Estimation of Salinity, Dissolved oxygen and Alkalinity in two water samples.
3. Mountings; Placoid, Cycloid and Ctenoid scales,
4. Museum specimens, slides, models and charts: Catla, Rohu, Mrigal, Channa, Penaeus, Crossostrea, Raft culture, Pinctada, Argulus, Lernaea.

Reference Books:

1. Beavan, R. Handbook of Freshwater Fisheries on India. Narendra Publishing House, 1417, Kishan Dutt Street, Maliwara, Delhi – 110006
2. Biswas, K.P. Prevention and control of fish and prawn diseases, Narendra Publishing House, 1417, Kishan Dutt Street, Maliwara, Delhi – 110006
3. Dash, M.C. and P.N. Patnik, Brackish Water Prawn Culture, Palani Paramount Publications, 69-D., Anna Nagar, Palani – 624602
4. Dick Mills, Tropical Aquarium Fishes, Chencellor Press, Michelin House, 81, Fulham Road, London SW3 6RB.
5. Jhingran, V.G. Fish and Fisheries of India, Hindustan Publishing Corporation (India), Delhi
6. Khanna, S.S. Introduction of Fishes, Central Book Dept, Allahabad
7. Kurian, C.V. and V.O. Sebastian, Prawns and Prawn fisheries of India, Hindustan Publishing Corporation, Delhi – 110007
8. Latha Shenoy, Course Manual in Fishing Technology Central Institute of Fisheries Education (Indian Council of Agricultural Research), Versova, Bombay - 400061
9. Mary Chandy, Fishes. National Book trust. A-5, Green Park, New Delhi-110 016.
10. Pandian, T.J., Sustainable Indian Fisheries. National Academy of Agricultural Sciences. ICAR, Ministry of Agriculture, New Delhi.
11. Parihar. R.P. A Text Book of Fish Biology and Indian Fisheries. Central Publishing House, Allahabad.
12. Rath. R.K. Freshwater Aquaculture. Scientific Publishers. 5A. New Pali Road. Jodhpur, 342001.
13. Santhanakumar, G and A.M. Selvaraj. Concepts of Aquaculture. Meenam Publications. Nagercoil Lekshmi Papers, Thirumal Complex, Opp. Chakkaravarthi Theatre. Chettikulam Jn., Nagercoil - 629 002.
14. Santhanam, R., N. Sukumaran and P. Natarajan. A Manual of Freshwater Aquaculture. Oxford & IBH Publishing Co. Pvt. Ltd., 66 Janpath. New Delhi 110 001.
15. Sebastian. CD. A manual on seed production and Farming of giant freshwater prawn *Macrobrachium rosenbergii*. The Marine Products Export Development Authority MPEDA House, Panampilly Avenue, Kochi-682 036.
16. Srivastava, C.B.L. A Text Book of Fishery Science and Indian Fisheries. Kitab Mahal Distributors, 28, Netaji Subash Marg, New Delhi-110 002.
17. Sundararaj, V. and B. Srikrishnadhas, Cultivable Aquatic organisms, Narendra Publishing House, 1417, Kishan Dutt Street, Maliwara, Delhi - 110 006.

SEMESTER VI
PAPER 6.4.B
MEDICAL LABORATORY TECHNOLOGY
(5 Hrs/week)

Objective : To learn the utility and the applications of the instruments so as to study the etiology of various diseases affecting human beings.

Unit – I

Medical Laboratory Personnel – Code of conduct, Laboratory requirements, sterilization, Dry heat (Hot air oven), Moist heat (Autoclave, Pressure cooker), Laboratory equipments – Spectrophotometer, Incubator Refrigerator, Auto analyzer, Micro centrifuge, Automatic pipettes.

Unit –II

Collection of blood samples, Packed cell volume (PVC), Erythrocyte sedimentation Rate (ESR), RBC count, WBC count, Reticulocyte count, Total count, Differential Count, Pulse rate, Use of blood pressure Apparatus, Electrocardiogram , Echocardiogram, Estimation of haemoglobin, Artificial pacemaker.

Unit – III

Blood cross matching- Hepatitis test – haemolytic jaundice, ELISA, Estimation of blood glucose fasting two hour post prandial- Diabetes mellitus, Estimation of blood cholesterol, blood Urea, Blood Uric acid.

Unit – IV

Analysis of urine – Physical examination, blood cells, urine glucose, urine albumin, bile salts, ketone bodies, Urine culture – Antibiotic susceptibility test.
Pregnancy Test (Detection of HCG).
Analysis of faeces – Components of faeces their characteristics, factors affecting faeces composition.
Analysis of sputum – Pathological conditions that can be detected in sputum – their causes – Detection of Group A –Streptococcus

Unit – V

Cerebrospinal fluid – formation, composition function, conditions altering its composition – their causes. Seminal fluid- Composition of seminal fluid, Sperm count, abnormal sperms, common pathological conditions detected in semen – their causes.
Aminotic fluid – sex determination, Diagnosis of pathological conditions of developing foetus through analysis of amniotic fluid.

PRACTICALS:

1. Blood – Packed cell volume (PVC), erythrocyte sedimentation Rate (ESR), Reticulocyte Count, Total Count, Differential Count, Estimation of haemoglobin.
2. Urine – Albumin, sugar, ketone bodies, bile salts, bile pigments, pregnancy test – sputum- Microscopic structures seen in sputum – semen – Sperm count
3. Specimens, Slides, models and charts:- Haemocytometer, Haemoglobinometer, ESR tubes, Autoclave, Automatic pipette, Reticulocyte.

Reference Books:

1. Biswajit Mohanty and Sharbari Basu – Fundamentals of Practical Clinical Biochemistry, B.I. Publications PVT., LTD., 54, Janpath, New Delhi – 110001
2. Estridge B.H. Raynold A.P and Walters N.J. Basic Medical Laboratory Techniques, 4th edition, Thomson Delmar Learning, Eastern Press (Bangalore) Pvt., Ltd., Boommasandra Industrial Area, Hosur Road, Bangalore – 562158
3. Kannai, L.Mukherjee, Medical Laboratory Technology Vol. I, Vol – II and Vol – III . Tata Mc Graw Hill Publishing Company Limited, No:444/1, Sri Ekambara Naicker Industrial Estate, Alapakkam, Porur, Chennai – 600116
4. Ramnik Sood, Medical Laboratory Technology, Methods and Interpretations. Jaypee Brothers Medical Publishres (P) Ltd., New Delhi
5. Venkadesan, O. Essential of Medical Laboratory technology, Bicobas P.G and Research Department of Zoology, Loyola College, Madras - 600034

**SEMESTER VI
PAPER 6.4 C
MARINE BIOLOGY
(5 Hrs/ Week)**

UNIT I

Classification of marine environment- Horizontal and vertical- names and extent of different oceans
Physiological oceanography- physical properties of water, specific gravity, solubility and their influence on marine organisms

UNIT II

Origin of waves and tides- major water currents and their impact on animal and plant populations and productivity

UNIT III

Chemical Oceanography- major and minor constituents of seawater
Salinity and chemical composition and their influence on productivity
Energy cycle in marine environment, carbon, nitrogen, phosphorus cycles in marine environment

UNIT IV

Biological Oceanography- Study of phyto and zooplankton- adaptations of phytoplankton to float
A survey of economically important fish, prawn and molluscan populations in the nearby coastal region- their life history, food and feeding habits- their natural enemies

UNIT V

Marine Geology- study of marine sediments and their economic importance- oil resources- pollutants and their effect.
Coral reefs in the world

PRACTICALS:

1. Qualitative and quantitative analysis of planktons
2. Estimation of salinity
3. Estimation of nitrates, silicates and phosphates
4. Gut content analysis of local marine fish fauna at two different seasons
5. Collection of crabs & tackles used in fisheries (photographs and charts)
6. Study of the biology of any one marine organism available in the local area by each student

Reference Books:

1. M.C. Connaghey- Introduction to Marine Biology (Toppan Co.)
 2. Sir Frederick S. Russel and Sir Maurice Yonge- Advances in Marine Biology (Academic Press) 1971 Edition
 3. M.V. Moore- Marine Ecology (John Wiley sons)
-

Model Questions

SEMESTER III 3.1. CELL AND MOLECULAR BIOLOGY

Part A (10 x 1 = 10 marks)

Answer all questions Choose the correct Answer

- The commonly used fixative are
a) Acetic Acid b) Picric Acid c) Acido philicd)Enzyme
- The process of removing water vapour by certain chemical reagents from the cell is called
a) dehydration b) freezing c) Fixation d) Staining
- The power house of the cell is
a) Golgi Complex b) Ribosome c) Mitochondrion d) Centriole
- The RNA and proteins are main chemical composition of
a) Ribosome b) Mitochondria
c) Plasma Membrane d) Endoplasmic Reticulum
- Chromosomes controls the
a) RNA synthesis b) Metabolism c) Respiration d) Heredity
- A set of genes responsible for the transformation of normal cells into tumour cells is called
a) Oncogenes b) Plasma genes c) Alleles d) None of the above
- In meiosis chromosomal synapsis happens in the stage
a) Leptotene b) Zygotene c) Pachytene d) Diplotene
- Purines are
a) Physical Compound b) Inorganic Compound
c) Organic Compound d) Carbohydrate
- Proteins are Synthesized by
a) RNA b)Lucine c) Alanine d) DNA
- Nature of genetic code is
a) Experimental b) Temporary c) Universal d) Change

Part - B (5 x 5 = 25 marks)

- (a) Write about the Chemical fixation
or
(b) Enumerate the structure of compound Microscope
- (a) Write a short notes on structure of Ribosomes?
or (b) Explain the ultra structure of rough and Smooth Endoplasmic reticulum.
- (a) Explain the types and properties of cancer cell
or
(b) Describe the structure and functions of chromosome?
- (a) Explain the molecular Structure of DNA
or
(b) Write about mitosis?

15. (a) Briefly mention the salient features of Genetic code?

Or

(b) Describe the structure of DNA

Part - C (5 x 8 = 40 marks)

16. a) Explain the principle, Structure and working of phase contrast microscope?

or

b) Briefly explain the stains and its uses?

17. a) What is ER? Describe the structure and functions of ER

or

b) Describe the ultra structure of Mitochondria and explain cell respiration

18. a) Describe the ultra Structure of Nucleus and its functions?

or

b) Define the term cancer. Describe the types, causes and treatment of cancer.

19. a) Describe the features of Watson - Crick model of DNA and state why these features are needed by the genetic material?

or

b) Compare the DNA with RNA?

20. a) Describe how the genetic code is deciphered?

or

(b) Explain the various methods of regulation of genetic code?

APPENDIX- AZ48

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI - 12

B.Sc COMPUTER SCIENCE (CBCS)

REGULATIONS AND SYLLABUS (2012-2013)

The **aims** of the Programme are:

- To impart theoretical and practical knowledge that underpins the various areas of computer science
- To impart basic computing skills & a selected set of skills that is currently in demand in IT field
- To impart the selected set of soft skills that are required for a computer professional in the global era
- To stimulate interest in humanities and thereby encourage an inter-disciplinary interest
- To create an awareness on social, ethical and professional issues related to computers

The **objectives** of the Programme are the following: On completion of the Programme, a student should:

- Manage the hardware and software components in a computer system independently and bloom either as a programmer in software industries
- Have sound skills in designing databases and managing them
- Have sound skills in designing web-based applications
- Have a good command of the English language for professional communication
- Have a variety of soft skills like technical documentation, presentation, quality awareness, team work, global outlook etc
- Be aware of professional, ethical and social issues in the IT field
- Have experience in successful completion of a medium sized real-life project in a team environment, in a time bound manner

1. Qualifications for Admission:

Candidate should have passed the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Government of Tamil Nadu or any other Examinations accepted by the syndicate as equivalent thereto with Mathematics / Computer Science as one of the subjects.

2. Duration of the Course:

The students shall undergo the prescribed course of study for a period of not less than three academic years (Six semesters).

3. **Medium of Instruction:** English

4. **Subjects of Study:** The subject offered is given in Appendix A.

5. **Scheme of Examination:**

a. The passing minimum is 40%. i.e., minimum 30 marks in external
(Internal + External = 40 marks).

b. Practical Examinations at the end of even semester

6. **Structure of question paper (Theory):**

Every question paper shall consist of three parts.

First part will carry **10 marks**, the question will be of Objective type. Each question carries 1 mark and candidates have to answer all **10 questions**.

Second part will carry **25 marks**, candidates have to answer **5 questions**, each question will be of either (or) type.

Third part will carry **40 marks**, candidates have to answer **5 questions**, each will be of either (or) type.

Total: 75 marks with three hours duration.

7. **Computer Facility:**

The College should provide with sufficient number of computers to the students as per the requirements of the syllabus

8. **Eligibility for the degree:**

(i) A candidate shall be eligible for the award of the degree on completion of the prescribed course of study and passing all the prescribed external examinations.

(ii) Attendance, progress and conduct certification from the head of the institution shall be required for taking the external examinations.

(iii) The passing minimum is 40% and a candidate will be declared to have passed

- (a) In I class if he / she has obtained 60% and above in the III part
- (b) In II class if he / she has secured 50% and above but less than 60%
- (c) In III class if he / she has secured 40% and above but less than 50%

(iv) The maximum period for the candidate to complete the UG course is 6 years.

Ranking will be made for the candidates who have successfully completed the course without any arrears in each semester with the candidates scored the maximum total in III part be put in the I Rank and the minimum total in III part be put in the last Rank.

9. Industrial visit:

Industrial visit may be arranged by the department for getting experience in successful completion of a medium sized real-life project in a team environment, in a time bound manner to a maximum of five working days.

10. Software Development Skill:

The objective of the Software development skill is to encourage group discussion and to enable the students, to work in convenient groups of not more than four members in a group, on a software development lab involving some design and fabrication work or theoretical and experimental studies related to computer science subjects studied during their course.

FIRST SEMESTER

<u>Sub-Code</u>	<u>SUBJECT TITLE</u>	<u>LECTURE RE Hours</u>	<u>LAB Hours</u>	<u>Credits</u>
	Part I -Language	6 hrs	---	3
	Part II- ENGLISH	6 hrs	---	3
	Part III Core 1: Theory Introduction to Computers and Programming in C	6 hrs	---	4
	Core 2: Practical Programming in C	---	4 hrs	4
	Allied I: Theory Discrete Mathematics	4 hrs	---	2
	Allied 2 : Practical Office Automation	--	2 hrs	--
	Part IV: Environmental Studies	2	--	2
Total	(5T+1P Courses)	24	6	18

SECOND SEMESTER

	Part I -Language	6 hrs	---	3
	Part II- ENGLISH	6 hrs	---	3
	Part III Core 3: Theory Object Oriented programming using C++	6 hrs	---	4
	Core 4: Practical OOP using C++	--	4 hrs	4
	Allied 3 : Theory Digital Design	4 hrs	---	4
	Allied 2 : Practical Office Automation	---	2 hrs	4
	Part IV : Value Based Education	2	--	2
Total	(5T+2P Courses)	24	6	24

<u>THIRD SEMESTER</u>				
	Part III : Core 5: Theory Computer Architecture	6 hrs	---	4
	Core 6: Theory Java Programming	6 hrs	---	4
	Core 7: Practical Java Programming	---	6 hrs	4
	Allied 4: Theory Data Structure	4 hrs	---	4
	Allied 5: Practical Data Structure Lab	---	2 hrs	--
	Part IV: Skill Based Subjects Internet Fundamentals (OR) Flash	1hr	3 hrs	4
	Non Major Elective I Introduction to Computers (OR) Programming in C	2 hrs	---	2
Total	(5T+1P Courses)	19	11	22
<u>FOURTH SEMESTER</u>				
	Part III: Core 8: Theory Visual Basic	6 hrs	---	4
	Core 9: Theory – Elective I Microprocessor (OR) Embedded System (OR) Introduction to Open Source	6 hrs	---	5

	Core 10 : Practical Visual Basic	---	6 hrs	4
	Allied 6: Theory Resource Management Techniques	4 hrs	---	4
	Allied 5 : Practical Data Structure	---	2 hrs	2
	Part IV: Skill Based Subject - Common	4 hrs	--	4
	Non Major Elective II Basic Program Design (OR) C++ Programming	2 hrs	---	2
	Part V : Extension Activity	---	---	1
Total	(5T+2P Courses)	22	8	26

FIFTH SEMESTER

	Part III: Core 11: Theory Software Engineering	4 hrs	---	4
	Core 12: Theory Computer Graphics & Multimedia	4 hrs	---	4
	Core 13 : Theory Web Technology	4 hrs	---	4
	Core 14: Theory – Elective II Artificial Neural Network (OR) Cloud Computing (OR) ASP.NET	6 hrs	---	5
	Core 15 : Practical Computer Graphics & Multimedia Lab	---	8 hrs	4

	Part IV: Skill Based Subject II PC Troubleshooting (OR) Dream Viewer	1hr	3 hrs	4
Total	(5T+1P Courses)	19	11	25
<u>SIXTH SEMESTER</u>				
	Core 16: Theory Operating Systems	4 hrs	---	4
	Core 17: Theory Computer Networks and Data Communications	4 hrs	---	4
	Core 18: Theory Data Mining	4 hrs	---	4
	Core 19: Theory RDBMS	4 hrs	---	4
	Core 20: Practical RDBMS	---	8 hrs	4
	Core 21: Practical Software Development Lab	---	6 hrs	5
Total	(5T+1P Courses)	16	14	25

Total number of courses : 38 (30T+8P)

Total number of hours : 180

Total number of credits : 140

Distribution of marks between External and Internal Assessment in Theory is 75 : 25; in Practical 60 : 40.

Pass Minimum of 40% for External and overall Components.

Software Development Lab: External - 60 marks & Internal (Project Report)-40 marks.

Appropriate Major / Allied related, 'Allied Courses' and 'Skill Based Courses' may be chosen by the major departments, taking into account the total work-load of the department.

COMPUTER ARCHITECTURE

Unit I 18 hours

Basic Computer Organization:

Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle – Control Memory – Address Sequencing

Unit II 18 hours

CPU:

General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Program control

Unit III 18 hours

Computer Arithmetic:

Hardware Implementation and Algorithm for Addition, Subtraction, Multiplication, Division – Booth Multiplication Algorithm – Floating Point Arithmetic

Unit IV 18 hours

I/O and Memory Organization:

I/O Interface – Asynchronous Data Transfer – Modes of I/O Transfer – Priority Interrupt – Direct Memory Access - Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory

Unit V 18 hours

Advanced Processing:

RISC, CISC Characteristics - Parallel Processing – Pipe Lining – vector processing – array processors – Multi processors – Interconnections structures

TEXT BOOK:

M. Morris Mano, “Computer System Architecture”, Third Edition, Reprint 2003 Pearson Education.

REFERENCE BOOK:

1.Nirmala Sharma, “Computer Architecture”, First Edition,2009, University Science Press

2.Nicholos Carter, “Computer Architecture”, 2006, TMH Publication

JAVA PROGRAMMING

UNIT I

18 hours

Data Types, Variables and Arrays: Primary types – Integers – Floating point types – Characters – Booleans – A Closer Look at Literals – Variables – Type Conversion and Casting – Automatic type Promotion in Expressions - One Dimensional Arrays– Multi Dimensional Arrays.

Operators: Arithmetic Operators – Bitwise operators – Relational Operators – Boolean Logical Operators – Assignment Operator – Conditional Operator – Operator Precedence-Using parentheses.

Unit II

18 hours

Introducing Classes: Class Fundamentals – Declaring Objects – Assigning Object Reference Variables – Introducing Methods – Constructors – Garbage Collection – finalize() Method.

A Closer Look at Methods and Classes: Overloading Methods – Using Objects as Parameters – Argument Passing – Returning Objects – Recursion – Introducing Access Control – Understanding static – Introducing final – Nested and Inner classes – String Class – Using command line arguments.

Inheritance: Inheritance Basics – Using super – Creating Multilevel Hierarchy-Method Overriding-Dynamic Method Dispatch – Using Abstract classes – Using final with Inheritance – The Object class.

Unit III

18 hours

Packages and Interfaces: Packages – Access Protection – Importing Packages – Interfaces.

Exception Handling: Introduction – Exception Types – Using try and catch – Multiple catch Clauses – Nested try Statements – throw – throws – finally

Multithreaded Programming: Java Thread Model – Main Thread – Creating a Thread – Creating Multiple Threads – Using isAlive () and join() – Thread Priorities.

Unit IV

18 hours

The Applet Class: Applet Basics – Applet Architecture – Applet Skeleton – Applet Display Methods – Requesting Repainting – HTML APPLET tag – Passing Parameters to Applet.

Event Handling: Event Handling Mechanisms – Delegation Event Model – Event Classes – Sources of Events – Event Listener Interfaces – Handling Mouse Events and Keyboard Events.

Unit V

18 hours

Introducing the AWT: AWT Classes – Window fundamentals – Working with Frame Windows-Working with Graphics – Working with color – Working with Fonts

Using AWT Controls: Controls Fundamentals – Labels – Using Buttons – Applying Check Boxes – Check Box Group – Choice Controls – Using a TextField –Using a Text Area – Understanding Layout Managers – [Flow Layout Only] – Menu Bars and Menus-Dialog Boxes.

TEXT BOOK:

Java, The Complete Reference 8/e , Herbert Schildt, TMH

REFERENCE BOOK:

1. Java Programming A Practical Approach, C.Xavier, TMH
2. Programming in Java, Sachin Malhotra, Saurabh Choudhary, OXFORD University Press
3. Core Java, Mahesh P. Matha, PHI Learning Private Limited

JAVA - PRACTICAL LIST

1. Define a class called Student with the attributes Name, Reg-Number and Marks Obtained in four subjects(m1,m2,m3,m4).Write a suitable constructor and methods to find the total mark obtained by the student and display the details of the student.
2. Write a Java program to find the area of a square, rectangle and triangle by
 - (i) Overloading Constructor
 - (ii) Overloading Method.
3. Write a java program to add two complex numbers.[Use passing object as argument and return object].
4. Define a class called Student with data members name, roll number and age. Write a suitable constructor and a method output () to display the details.

Derive another class Student1 from Student with data members height and weight.

Write a constructor and a method output () to display the details which overrides the super class method output().[Apply method Overriding concept].

5. Write a java program to create a package "Student" which contains the classes Emp and Memp. The data members of Emp are name, emp_id, category and Bpay. Write suitable constructors and methods to compute net pay of the employee. The class Memp contains the main method.
6. Write a java program to create an interface called Demo, which contains a double type constant, and a method called area () with one double type argument.
Implement the interface to find the area of a circle.
7. Write a java program to create a thread using Thread class.
8. Write a java program to Design a calculator to perform only addition and division. It must contains three Buttons with labels +, / and =, and a TextField to get input and display the result.
9. Create an applet with four Checkboxes with labels MARUTI-800, ZEN, ALTO and ESTEEM and a Text area object. The program must display the details of the car while clicking a particular Checkbox.
10. Write a Java program, which creates a window with a check box group with boxes for the colors, Violet, Indigo, Yellow, Orange, Red, Blue, and Green. When the button is selected the background colour must change accordingly.
11. Write a Java program to throw the following exception,
 - 1) Negative Array Size
 - 2) Array Index out of Bounds
12. Write a java program to create a file menu with options New, Save and Close, Edit menu with option cut, copy and paste.

DATA STRUCTURE

UNIT I

12 hours

Introduction and Overview:

Definitions – Concept of Data Structures – Overview of Data Structures – Implementation of Data Structures – Organization of the Book

Arrays and Tables:

Definition – Terminology – One – Dimensional Array – Multidimensional Arrays
Tables:-Rectangular Tables – Jagged Tables – Inverted Tables – Hash Tables – Problems to Ponder

UNIT II**12 hours**

Linked Lists:

Definition – Single Linked List – Circular Linked List – Double Linked Lists – Circular Double Linked List – Applications of Linked Lists – Memory Representation – Boundary Tag System – De allocation Strategy

UNIT III**12 hours**

Stacks and Queues:

Introduction – Definition – Representation of a Stack – Operations on Stacks – Applications of Stacks –Queues: Introduction – Definition – Representation of Queues – Various Queue structures

UNIT IV**12 hours**

Trees:

Basic Terminologies – Definition and concepts – Representations of Binary Tree – Operations on a Binary Tree – Types of Binary Trees – Expression Tree-Binary Search Tree-Heap Trees

UNIT V**12 hours**

Graphs:

Introduction – Graph Terminologies – Representation of Graphs – Operations on Graphs – Application of Graph Structures – Quick Sort-Merge Sort

TEXT BOOK:

Classic Data Structures, Debasis Samantha, PHI Learning Private Limited

REFERENCE BOOK:

- 1.Data Structures, A pseudo code approach with C++, Richard F.Gilberg and Behrouz A. Forouzon, Thomson Publications.
2. Data Structures Using C++, Varsha H. Patil, OXFORD University Press

DATA STRUCTURES – PRACTICAL LIST

1. Write a C++ program to implement sequential search and binary search in array.
2. Write a C++ program to implement linked list and perform the following operations
 - a. Add a node as first node
 - b. Add a node as last node

3. Write a C++ program to implement linked list and perform the following operations
 - a. Delete the first node
 - b. Delete the last node
4. a. Write a C++ program to implement a stack using linear list perform the push and pop operations
 - b. Write a C++ program to implement a queue using circular list and implement add and delete operations.
5. Write a C++ program to implement binary tree using linked and perform the following traversal.
 - a. In order Traversal
 - b. Pre order Traversal
 - c. Post Order Traversal
6. Write a C++ program to implement graph using Adjacency matrix and perform the following operations.
 - a. Depth First search
 - b. Breadth First search
7. Write a C++ program to implement merge sort
8. Write a C++ program to implement Quick sort.

INTERNET FUNDAMENTALS

1. Finding the IP address of a system using DOS and windows operating systems.
2. E-mail creation.
3. How to configure outlook express.
4. How to stop pop up- pop under Internet Advertisements.
5. How to enable-disable -delete internet cookies.
6. How to determine the speed of My Internet Connection(Transfer rate when downloading a file).
7. Changing the home page of my browser.
8. Creation of Internet favourites/bookmark.
9. How to install internet security.
10. How to ping another node.
11. How to install the following web browsers: Opera, Fire box, Safari.
12. Creation of a simple web page.

FLASH

1. Transformation of objects
2. Create an animation of an Image
3. Create new buttons.
4. Loading an external video file
5. Creating motion of object
6. Drag a movie clip using script.
7. Create scrollbars in a text.

INTRODUCTION TO COMPUTERS

Unit : I

6Hrs

Number System : Number System – Base of System, Types of Number System – Conversion Between Number Bases: Conversion of Decimal to Binary – Binary to Decimal – Decimal to Octal – Octal to Decimal - Binary to Octal – Octal to Binary – Decimal to Hexadecimal – Hexadecimal to Decimal - Binary to Hexadecimal and Hexadecimal to Binary.

Logic Gates : Basic Logic Gates, NAND and NOR gates only.

Unit II

6Hrs

Introduction to Computers: Introduction – Characteristics of Computers – Evolution of Computers - Generation of Computers – Classification of Computers : Based on purpose, Based on type of data handling techniques, and According to Functionality – The Computer System – Application of Computers.

Unit III

6Hrs

Input Devices: Keyboard – Pointing Devices – Webcam – Scanners – Optical Character Recognition – Optical Mark recognition – Magnetic Ink Character Recognition – Bar Code Reader.

Output Devices: Printers – Plotters – Computer Output Microfilm – Monitors – Voice Recognition System – Projectors.

Unit IV

6Hrs

Primary memory: Memory Representation – Memory Hierarchy – Random Access Memory – Read Only memory – Types of ROM.

Secondary Storage: Classification of Secondary Storage Devices – Storage Organization of Magnetic Disk – Storage Organization of Optical Disk – Magneto-Optical Disk – Universal Serial Bus.

Unit V

6Hrs

Data Communication: Data Communication Components, Data Transmission Mode, Data Communication Measurement

Computer Network: LAN, WAN and MAN – Network Topologies – Network Devices: Network Interface Card, Hub, Repeater, Switch, Bridge, Router and Gateway.

Internet Basics: Basic Internet Terms – Internet Applications – E-mail.

TEXT BOOK:

Introduction to Computer Science, IITL Education Solutions Limited, 2/e, Pearson

REFERENCE BOOK:

1. Fundamentals of Computers, V.Rajaram, 5th Edition, PHI
2. Introduction to Computers, Peter Norton, 7/e, TMH.

PROGRAMMING IN C

Unit I

6 Hrs

Introduction to C: The C Character set – Identifiers and keywords – Data types – Constants – Variables – Declaration of variables.

Operators and Expressions: Arithmetic Operators – Relational and Logical Operators – Assignment Operators – Increment and Decrement operators - The Conditional Operator

Unit II

6 Hrs

Data Input and Output: Formatted Input and Output only [ie., scanf() and printf() only].

Control Statements: The if statement - if-else Statement – nested –if - The for loop Statement (only) –The Switch Statement – The goto Statement.

Unit III

6 Hrs

Arrays: Declaration of one dimensional array - Processing an Array – two dimensional array.

Pointers: Pointer Declarations – Simple pointer expressions - Pointers and One Dimensional Arrays.

Unit IV

6 Hrs

User-Defined Functions: Defining a Function – Function calls – Return values and their types – Function declaration – Function with argument and return type (only) – Recursion.

Unit V

6 Hrs

Structures : Defining a Structure – Processing a Structure**File Management in C:** Defining and Opening a File – Closing a file – Input and Output operations on file.**Text Books**

Programming in ANSI C , Fifth Edition, E.Balafurusamy, Tata McGraw Hill Education Private Limited

Reference Books

1. Computer Fundamentals and Programming in C, Reema Thareja, Oxford University Press
2. How to Program C, Sixth Edition, Paul Deitel and Harvey Deitel, PHI Learning Private Limited
3. Programming with ANSI and Turbo C, First Edition, Ashok N. Kamthane, Pearson Education

VISUAL BASIC**Unit I****18 hours****Getting started with Visual Basic 6.0:** Introduction to Visual Basic - Visual Basic 6.0 Programming Environment – Working with Forms – Developing an Application – Variables, Data types and Modules – Procedures and Control Structures – Arrays in Visual Basic – Additional Examples.**Working with Controls:** Introduction – Creating and using Controls – Working with Control Arrays – Additional Examples.**Unit II****18 hours****Menus, Mouse Events and Dialog Boxes:** Introduction – Mouse Events – Dialog Boxes - additional Examples.**Graphics, MDI, and Flex Grid:** Introduction – Graphics for Applications – Multiple Document Interface(MDI) – Using the Flex Grid Control - Additional Examples.**Unit III****18 hours****ODBC and Data Access Objects:** Evolution of Computer Architectures – Data Access Options - Additional Examples.**ODBC using Data Access Objects and Remote Data Objects:** Open Database Connectivity (ODBC) – Remote Data Objects – Additional Examples.

Unit IV

18 hours

Data Environment and Data Report: Introduction – Data Environment Designer – Data Report - Additional Examples.

Object Linking and Embedding: Introduction - OLE Fundamentals – Using OLE Container Controls – Using OLE Automation Objects - OLE Drag and Drop - Additional Examples.

Objects and Classes: Introduction to Objects – Working with Objects – Classes and Class Modules - Additional Examples.

Unit V

18 hours

Built-In ActiveX Controls: Working with Built-In ActiveX Controls - Additional Examples.

Working with ActiveX Data Objects: An Overview of ADO and OLE DB – ADO Object Model - Additional Examples.

Files and File System Controls: Introduction – File System Controls – Accessing Files – Interface with Windows - Additional Examples.

Text Book:

Visual Basic 6.0 Programming – Content Development Group – Tata McGraw-Hill Publishing Company Limited, New Delhi.

Reference Books:

1. VISUAL BASIC 6 in Record Time by Steve Brown, BPB Publications.
2. VISUAL BASIC 6 from the Ground UP – GARY CORNELL – Tata McGraw Hill.

VISUAL BASIC - PRACTICAL LIST

1. Design an Analog Clock.
2. Design a Desktop Calculator.
3. Design Mixing of Colors using basic Colors.
4. Create an application to format the text inside the text box.
5. Create an application using File controls and use two option buttons to show and hide a picture in the Picture box.
6. Create an application to do Matrix Addition using Flex Grid control.
7. Create an Editor with File and Edit Menus using Menu Editor Tool.
8. Create a MDI Application with tile and cascade child forms.
9. Create an application to implement OLE Drag and Drop.
10. Create a mailing address database in access and view the records using Data Control.
11. Create a student database application using ADO.
12. Create a student database in Access and prepare a Report using Data Report Control.

MICROPROCESSOR

UNIT I

18 hours

Microprocessors, Microcomputers and Assembly language

Microprocessors-Microprocessor Instruction set and Computer languages-From large computer to single chip microcontrollers.

Introduction to assembly Language Programming-The 8085 Programming Model

Instruction classification – Instruction, Data format and storage-How to write, assemble and execute simple program. Overview of 8085 instruction set –Writing and hand assembling a program

UNIT II

18 hours

Microprocessor Architecture and micro computer systems

Microprocessor Architecture and its operations-Memory-Input and output (I/O)

Devices-Example of a microcomputer system.

8085 Microprocessor Architecture and Memory Interfacing : The 8085 MPU-Example of an 8085 based microcomputer –memory interfacing –interfacing the 8155 memory segment

UNIT III

18 hours

Introduction to 8085 instructions

Data transfer instruction-Arithmetic operations-Logic operations-Branch operations-Writing an assembly language programs – Debugging a program.

Programming Techniques with additional instructions

Programming Techniques: Looping, Counting and Indexing –Additional Data transfer and 16 bit instructions-arithmetic operations related to memory-Logic operation –Rotate-Compare-Dynamic Debugging.

UNIT IV

18 hours

Counters and Time Delays –Hexadecimal counter-Modulo ten counter-Generating pulse waveforms-Debugging counter and time delay programs.

Stack and Subroutine: Stack-Subroutine-Restart-Conditional call and Return instructions –advanced subroutine concepts.

UNIT V

18 hours

BCD to Binary Conversion-Binary to BCD Conversion –BCD to seven segment LED Conversion-BCD addition –BCD subtraction-multiplication-subtraction with carry.

TEXT BOOK:

Microprocessor Architecture Programming and Applications with the 8085, Ramesh S Goankar, Fifth edition, Penram International publisher.

REFERENCE BOOK:

- 1.8085 Microprocessor Programming and interfacing, N.K.Srinath, PHI Publication.
2. Microprocessors and Microcontrollers, N. Senthil Kumar, M.Saravanan, S. Jeevananthan, Oxford University Press.

EMBEDED SYSTEM

Unit I

18 hours

Introduction to embedded system – Examples of Embedded systems –Typical hardware - Gates-Timing diagram-Memory

Unit II

18 hours

Advanced hardware fundamentals:

Microprocessors Buses-DMA-Interrupts-Built in on the microprocessor –Conventions used on schematic –Schematic interrupts microprocessor Architecture-Interrupt basics-Shared data problem-Interrupt latency

Unit III

18 hours

8051 Micro controllers:

Micro controllers and Embedded processors –Overview of 8051 family- Block diagram – PIN description

Unit IV

18 hours

Software Development:

Round-Robin, Round Robin with interrupts, function-queue-scheduling architecture, Algorithms, introduction to assembler, compiler, cross compilers and IDE, Recursion, Debugging strategies, Simulators

Unit V

18 hours

RTOS:

Task and Task states, Task and data, Semaphores and shared data.

OS services-Message queues-Timer function-Events-Memory management -interrupt routines in RTOS environment- Basic design using RTOS.

TEXT BOOK:

1. David E. Simson, An embedded Software primer, Pearson Education Asia, 2001

REFERENCE BOOK:

1. The 8051 Microcontrollers and Embedded systems using Assembly and C, Muhammed Ali Mazidi, Rolin D. McKinlay, Pearson Education

2. Raj Kamal, Embedded Systems Architecture, Programming and Design, TMH, 2003

INTRODUCTION TO OPEN SOURCE SOFTWARE**Unit I****18 hours**

History and Emergence of Open Source Software: The philosophy of OSS, Richard Stallman, The Cathedral and the Bazaar (CatB), commercial software vs OSS, free software vs freeware. Open source development models. Application Programming Interface (API). GNU Project, Free Software Foundation.

Unit II**18 hours**

Community Building: Importance of Communities in Open Source Movement. JBoss Community. Developing blog, group, forum, social network for social purpose.

Unit III**18 hours**

Open Standards: National Information Standards Organization (NISO), The Digital Library Federation (DLF). The Dublin Core Metadata Initiative. MARC standards, Resource Description and Access (RDA). Open Archives Initiative. OAI-PMH. Search / Retrieval via URL (SRU), SRW/CQL. Java Platform, Enterprise Edition (Java EE).

Unit IV**18 hours**

Open Source Licenses: GNU General Public License (GPL) version 2,3, GNU Lesser General Public License (LGPL) version 2.1,3, GNU Affero General Public License (AGPL) version 3, Apache License, Version 2.0, ArtisticLicense2.0, etc.
Operating System: The Linux operating system and its use both for desktops and as server software.

Unit V**18 hours**

Webserver: Apache HTTP Server and its flavors. WAMP server (Windows, Apache, MySQL, PHP). Open Source MySQL. Apache, MySQL, PHP, JAVA as development platform.

Open Source Software: Category of Open Source Software. OSS for podcasts, RDBMS, online social networks, etc. open source bibliometric softwares like pajek,ucinet,etc.

REFERENCES:

1)	http://directory.fsf.org/GNU/
2)	http://www.diglib.org
3)	http://www.entirelyopensource.com/
4)	http://www.niso.org/
5)	The Dublin Core Metadata Initiative < http://dublincore.org/ >
6)	MARC standards < http://www.loc.gov/marc/ >
7)	Resource Description and Access (RDA) < http://www.rdaonline.org/ >
8)	WAMP server (Windows, Apache, MySQL, PHP) < http://www.wampserver.com/en/ >
9)	Open Source MySQL < http://www.mysql.com/ >
10)	Search / Retrieval via URL (SRU) < http://www.loc.gov/standards/sru/ >
11)	< http://www.loc.gov/standards/ >
12)	< http://iesr.ac.uk/use/sru/ >
13)	< http://java.sun.com/javase/ >
14)	< http://www.jboss.org/ >

RESOURCE MANAGEMENT TECHNIQUES

Unit I

12 hours

Linear Programming Problem (LPP) - Mathematical Formulation of L.P.P- Simplex Method - Maximization.

Unit II

12 hours

Game Theory- Mixed strategies- saddle point- Dominance Property- Graphical method- Method of solving 2xn game-Method of solving nx2 game- Application of L.P.P in Game theory.

Replacement Problem- Individual replacement- Groups replacement- model I
Replacement of an item whose maintenance cost increases with time and money value is not changed.

Unit III

12 hours

Queuing Theory- Poisson Process - Model I (M|M|1): (∞|FIFO) - Generalisation Model.

Unit IV

12 hours

Inventory Control- Various Costs- Deterministic Model- Probabilistic or stochastic- Model I-Model II- No shortage- Model III with shortage- Newspaper boy problem.

Unit V**12 hours**

Network Analysis- CPM- Determination of Critical path and Project Duration- PERT- Time estimates- Variance for activities.

TEXT BOOK:

Operations Research, P. R. Vital and V. Malini, Margham Publications.

REFERENCE BOOK:

1. Operations Research Principles and Practice, Pradeep Prabhakar Pai, OXFORD University Press.
2. Operations Research, R.Panneerselvam, PHI.

BASIC PROGRAM DESIGN**Unit I****6Hrs**

Computer Program: Introduction – Developing a program – Algorithm – Flowchart – Decision Tables – Pseudocode.

Unit II

Program Testing and Debugging – Program Documentation – Program Paradigms: Unstructured programming, Structured programming and Object Oriented Programming – Characteristics of a Good Programming.

Unit III**6Hrs**

Computer Languages: Evolution Programming Languages – Classification of Programming Languages – Generation of Programming Languages – Features of Good Programming language.

Unit IV**6Hrs**

Computer Software: Software Definition – Relationship between Software and Hardware - Software Categories : System Software and Application Software – Terminology Software Firmware, Liveware, Freeware, Public Domain Software, Shareware, Commercial Software and Proprietary Software.

Unit V**6Hrs**

Operating System: Definition – Evolution of Operating System – Types of Operating System – Functions of Operating System – Modern Operating System: Windows XP and Windows 7.

TEXT BOOK:

Introduction to Computer Science, ITL Education Solutions Limited, 2/e, Pearson

REFERENCE BOOK:

1. Fundamentals of Computers, V.Rajaram, 5th edition, PHI
2. Introduction to Computers, Peter Norton, 7/e, TMH.

C++ PROGRAMMING**Unit I****Classes and Objects:****6 Hrs**

classes in C++ - declaring objects – the public keyword – the private keyword – the protected keyword – defining member functions – characteristics of member functions – inline function.

Unit II**Constructors and destructors:****6 Hrs**

constructors and destructors – characteristics of constructors and destructors – constructors with arguments – overloading constructors – constructors with default arguments - constructor and destructor with static members.

Unit III**Operator overloading and type conversion:****6 Hrs**

The keyword operator – overloading unary operator – operator return type – overloading binary operators - rules for overloading operators.

Inheritance:

Access specifiers and simple inheritance – single inheritance and multiple inheritance only.

Unit IV**Pointers and Arrays:****6 Hrs**

Pointer declaration - pointer to object – the this pointer

Polymorphism and Virtual functions: Pointer to derived class objects- Virtual Functions - Rules for Virtual Functions

Unit V

Files:

6 Hrs

File stream classes – steps of file operations – checking for errors – finding end of a file – file opening modes – file pointers and manipulators – manipulators with arguments – sequential read and write operations

Text Book:

Object-Oriented Programming with ANSI & Turbo C++, Ashok N. Kamthane, 2009, Pearson Education

Reference Books:

1. Programming with ANSI C++, Bhushan Trivedi, 2010, OXFORD University Press
2. Object Oriented Programming C++, E. Balagurusamy, 4th Edition, Tata McGraw Hill Education Private Limited
3. C++ and object oriented programming paradigm, Debasish Jana, 2nd Edition, PHI Learning Private Limited

SOFTWARE ENGINEERING

UNIT I

12 hours

Introduction – Software Engineering Discipline – Evolution and Impact – Programs Vs Software Products – Emergence of Software Engineering – Changes in Software Development Practices – Computer Systems Engineering. Software Life Cycle Models: Use of a Life Cycle Models – Classical Waterfall Model – Iterative Waterfall Model – Prototyping Model – Evolutionary Model – Spiral Model. Software Project Management: Responsibilities of a Software Project Manager – Project Planning – Metrics for Project Size Estimation – Project Estimation Techniques –Risk Management – Software Configuration Management.

UNIT II

12 hours

Requirements Analysis and Specification: Requirements Gathering and Analysis –Software Requirements Specification (SRS) – Formal System Development Techniques; Software Design: Characteristics of a Good Software Design – Cohesion and Coupling –Neat Arrangement – Software Design Approaches.

UNIT III**12 hours**

Function-Oriented Software Design: Overview of SA/SD Methodology – Structured Analysis – Data Flow Diagrams (DFDs) – Structured Design - Detailed Design – Design Review. Object Modeling Using UML: Overview of Object-Oriented Concepts – UML – UML Diagrams – Use Case Model – Class Diagrams – Interaction Diagrams – Activity Diagrams – State Chart Diagram.

UNIT IV**12 hours**

User Interface Design: Characteristics of a Good User Interface – Basic Concepts – Types of User Interfaces – Component-Based GUI Development; Coding and Testing: Coding – Testing – UNIT Testing – Black-Box Testing – White-Box Testing – Debugging –Integration Testing – System Testing.

UNIT V**12 hours**

Statistical Testing –Software Quality – Software Quality Management System – ISO 9000. Computer Aided Software Engineering: CASE Environment – CASE support in Software Life Cycle – Characteristics of CASE Tools –Architecture of a CASE Environment. Software Maintenance: Characteristics of Software Maintenance – Software Reverse Engineering – Software Maintenance Process Models – Estimation of Maintenance Cost; Software Reuse: Issues in any Reuse Program – Reuse Approach.

TEXT BOOK:

Fundamentals of Software Engineering - RAJIB MALL, Prentice Hall of India Learning Private Limited, 2008.

REFERENCE BOOK:

1. SOFTWARE ENGINEERING CONCEPTS, Richard Fairley, TMH.
2. OBJECT ORIENTED SOFTWARE ENGINEERING, Yogesh Singh,Ruchika Makhotra, PHI Learning Private Limited
3. Software Engineering, Principles and Practices, Depak Jain, OXFORD University Press

COMPUTER GRAPHICS AND MULTIMEDIA

Unit I

12 hours

Overview of Graphics System: Video Display Devices – Input Devices - Hard Copy Devices – Graphics Software.

Output Primitives: Points and Lines –Line drawing algorithms – DDA algorithm- Bresenham's line algorithm- Circle drawing algorithms: properties of circles – Midpoint circle algorithm – Filled Area primitives.

Unit II

12 hours

Attributes of Output Primitives: Line attributes – Curve attributes – Character attributes.

Two-Dimensional Geometric Transformation: Basic Transformations – Matrix Representations and homogenous co-ordinates – Composite and other Transformations.

Unit III

12 hours

Two-Dimensional Viewing: The viewing pipeline, Viewing co-ordinate reference frame – Window to view port co-ordinate transformation – Two-dimensional viewing function.

Clipping Operations: Point clipping – Line clipping (only Cohen-Sutherland line clipping) – Polygon Clipping (only Sutherland-Hodgeman polygon clipping).

Unit IV

12 hours

Interactive Input Methods: Input of graphical data – Input functions – Three dimensional display methods.

Three Dimensional Viewing: Projections. Visible surface deduction methods: Back-face deduction – Depth buffer method.

Unit V

12 hours

Multimedia Introduction: What is Multimedia? – Hardware components of a Multimedia system.

Multimedia Elements: Text and Graphics – Sound – Animation – Video – Issues and trends in Multimedia.

TEXT BOOK:

1. Computer Graphics, Second Edition, Donald Hearn, M. Pauline Baker, Pearson Publications. Chapters: 2.1, 2.6, 2.7, 3.1, 3.2, 3.5, 4.1, 4.2, 4.5, 5.1 to 5.4, 6.1 to 6.8, 8.2, 8.3, 9.1, 12.3, 13.2, 13.3.
2. Multimedia in Action, James E. Shumman, Vikas Publishing House, Chapters 1 to 4 and 12.

REFERENCE BOOK:

1. Computer Graphics, Apurva Desai, Prentice Hall of India, 2012
2. Principles of Interactive Graphics, William M. Newman, Robert F. Sproull 1979, McGraw Hill.
3. Desk top Multimedia Bible, Burger 1993, Addison Wesley.
4. Prabhat Andleigh, Kiran Thakrar, Multimedia System and Design, Prentice Hall of India, 2000.

WEB TECHNOLOGY**Unit I****12 Hours**

Introduction: What is the Internet-History of Internet-Internet Services and Accessibility-Uses of the Internet-Protocols-Web concepts-The client/server model at the web-Retrieving data from the web. Internet Protocols: Introduction – Internet protocols-transmission control protocols-User Datagram protocols - Host Names - Internet applications and application protocols.

Unit II**12 Hours**

HTML: Introduction-SGML-DTD-DTD Elements- attributes-outline of an HTML document-Head section-Body section-HTML forms-Dynamic HTML: Introduction-cascading style sheets-DHTML Document object model and collections-Event handling - filters and transitions.

Unit III**12 Hours**

Javascript: Introduction-language elements-objects of Javascript-other objects-Arrays. VBScript: Introduction-embedding VBScript code in an HTML document-comments-variables-operators-procedures-conditional statements-looping constructs-objects & VBScripts-Cookies.

Unit IV**12 Hours**

Introducing PHP & MYSQL: Features of PHP & MYSQL- Architecture- sample application-using variables, statements & operators: Embedding PHP in HTML- statement & comments-storing values in variables-simple data types-various operators to manipulate & compare variables-operator precedence.

Unit V**12 Hours**

Conditional statement & loops: conditional statements-merging forms-Repeating actions with loops: while(), do(), for() loop-break & continue.

Arrays & custom functions: Create Array-modify array element-processing array with loops-Grouping form selections with arrays-using array functions.

TEXT BOOK:

1. **Web Technology**, N.P Gopalan, J.Akilandeswari, PHI,2009

Unit I: chapters 1, 2

Unit II: chapters 4, 7

Unit III: chapters 5, 6.

2. **How to do Everything with PHP & MYSQL**, Vikram Vaswans, Tata MCGraw-Hill 2005.

Unit IV: chapters 1, 3.

Unit V: chapters 4, 5.

REFERENCE BOOK:

Web Technology, S. Padma Priya, SCITECH Publications (India)Pvt. Ltd

COMPUTER GRAPHICS AND MULTIMEDIA LAB

- 1 Write a program to translate an image
- 2 Write a program to rotate an image
- 3 Write a program to scale an image
- 4 Write a program to draw a line using DDA Algorithm
- 5 Write a program to draw a line using Bresenham's Algorithm
- 6 Write a program to draw a circle using Bresenham's Algorithm
- 7 Write a program to tiled or cascade a image according user option
- 8 Write a program to display an image as size of screen ,then reduces its size until disappears
- 9 Write a program to drop a word by word of a sentence from top
- 10 Write a program to display a news headlines letter by letter
- 11 Write a program to display as many as balls at random positions
- 12 Write a program to display a bouncing ball and moving with sound effect

ARTIFICIAL NEURAL NETWORKS

Unit I

18 hours

Introduction to Neural networks: Neural processing- Neural networks- an overview – the raise of neuro computing – introduction to artificial neural networks : introduction-artificial neural networks – historical development of neural networks – biological neural networks – comparison between the brain and the computer – artificial and biological neural networks – basic building blocks of artificial neural networks – artificial neural network terminologies.

Unit II

18 hours

Fundamental models of artificial neural networks: McCulloch-Pits neuron

Model-Learning rules.

Perceptron networks: Introduction –single layer perceptron –brief introduction to multi layer perceptron networks.

Unit III

18 hours

Feed back networks: Introduction- discrete Hopfield net-continuous Hopfield net-relation between BAM and Hopfield nets.

Feed forward networks: introduction-back propagation networks.

Unit IV

18 hours

Kohonen self - organizing feature maps - counter propagation network: introduction-Full counter propagation network-Forward only propagation network.

Unit V**18 hours**

Applications of Neural Networks: Applications of neural networks in Arts-Bioinformatics - Knowledge Extraction – Forecasting - Bankruptcy forecasting-Healthcare-Intrusion - Detection.

TEXT BOOK:

Introduction to Neural Networks using MATLAB 6.0., S N Sivanandam S Sumathi S N Deepa Tata McGraw Hill, 2006

REFERENCE BOOK:

- 1.Artificial neural Networks B.Yegnanarayana, Prentice Hall India, 2005
- 2.Neural Networks Algorithms, Applications and programming Techniques, James A Freeman David M Skapura, Pearson Education.
- 3.Neural Networks for Pattern Recognition, Christopher M. Bishop, Indian Edition, OXFORD University Press

CLOUD COMPUTING**UNIT I****18 hours**

INTRODUCTION Cloud Computing Introduction, From, Collaboration to cloud, Working of cloud computing, pros and cons, benefits, developing cloud computing services, Cloud service development, discovering cloud services.

UNIT II**18 hours**

CLOUD COMPUTING FOR EVERYONE Centralizing email communications, cloud computing for community, collaborating on schedules, collaborating on group projects and events, cloud computing for corporation, mapping schedules managing projects, presenting on road.

UNIT III**18 hours**

USING CLOUD SERVICES Collaborating on calendars, Schedules and task management, exploring on line scheduling and planning, collaborating on event management, collaborating on contact management, collaborating on project management, collaborating on word processing, spreadsheets, and databases.

UNIT IV**18 hours**

OUTSIDE THE CLOUD Evaluating web mail services, Evaluating instant messaging, Evaluating web conference tools, creating groups on social networks, Evaluating on line groupware, collaborating via blogs and wikis

UNIT V**18 hours**

STORING AND SHARING Understanding cloud storage, evaluating on line file storage, exploring on line book marking services, exploring on line photo editing applications, exploring photo sharing communities, controlling it with web based desktops.

TEXT BOOK:

Cloud Computing, Michael Miller, Pearson Education, New Delhi, 2009

REFERENCE BOOK:

1. Cloud Computing, Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, TMH, 2010
2. Cloud Computing for Dummies, Judith Hurwitz , Bloor Robin, Marcia Kaufman & Fern Halper, November 2009.

ASP.NET**UNIT I****18 Hours****The .NET Framework and .NET Languages**

The .NET Programming Framework - VB.NET , C# and the .NET languages - VB.NET versus VBScript and Visual Basic 6 - The Common Language Runtime - The .NET Class Library-ASP.NET - Visual Studio. NET

The .NET Languages - Data Types - Declaring Variables - Scope and Accessibility - Variable Operations –Object - Based Manipulation - Functions and Subroutines

UNIT II**18 Hours****Types, Objects and Namespaces**

The Basics about Classes - Value Types and Reference Types - Advanced Class Programming - Understanding Namespaces and Assemblies

Setting up ASP.NET and IIS

Web Servers and You-IIS Manager-Installing ASP.NET- Migrating from

ASP

UNIT III**18 Hours****ASP.NET Applications**

ASP.NET Applications - Code-Behind - The Global.asax Application File - Understanding ASP.NET Classes - ASP.NET Configuration

Web Form Fundamentals

A Simple Page Applet-Improving the Currency Converter - A Deeper Look at HTML Control Classes-The Page Class - Assessing HTML Server Controls

UNIT IV**18 Hours****Web Controls**

Stepping up to web controls - Web Control Classes - AutoPostBack and Web Control Events - A Simple Web Page Applet-Assessing Web Controls

Using Visual Studio .NET

The Promise of Visual Studio.NET - Starting a Visual Studio .NET Project - The Web Form Designer-Writing code - Visual Studio.NET Debugging - Working Without Visual Studio.NET

UNIT V**18Hours****Validation and Rich controls**

Validation - A Simple Validation Example-Understanding Regular Expressions

State Management

The Problem of state – View state - Transferring Information - Custom Cookies - Session state - Session state Configuration - Application state

Overview of ADO.NET

Introducing ADO.NET and Data Management-Characteristics of ADO.NET-The ADO.NET Object Model

TEXT BOOK:

The complete reference ASP.NET, Matthew MacDonald, Tata McGraw-Hill Edition 2002

REFERENCE BOOK:

Microsoft ASP.NET 4, George Shepherd, PHI Publications

PC TROUBLE SHOOTING –PRACTICAL LIST

1. Assembling a Computer.
2. Partitioning and Formatting Hard Disk.
3. Configuring a PC.
 - a) CMOS Setup.
 - b) Jumper Settings.
 - c) Switch Settings.
4. Memory Upgrading.
5. Testing Monitor and Keyboard (Types of Monitors and Monitor Signals)
6. Fault Finding on Mother Board Slots.
7. Testing Serial Port and Parallel Port.
8. Fault Finding on Driver Installation, Booting Problem
9. Testing of Computer SMPS (AC Supply, DC Supply, Proper earth to Neutral Voltage)
10. FDD Fault Finding.
11. HDD, CD ROM Fault Finding.
12. Installing Antivirus Software.
13. Identifying PC Problem by Applying Layman Checkup Procedure.

DREAMWEAVER

Design a home page for a book store.

1. Create HTML document to display a list of five flowers and link each one to another document displaying brief description of the flower, add pictures wherever possible.
2. Write an HTML code to display a list of 5 cars in a frame. Link each one to a brief description in second frame. The left frame should display the list and the right frame should display the paragraph about the frame.
3. Design a spry menu bar indicating software classification.
4. Create a feedback form using spry validation.
5. Create a homepage for computer hardware store using CSS file.

OPERATING SYSTEM

Unit I

12 Hours

Introduction: Operating System – Mainframe Systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real-time Systems.

Operating System Structures: System Components – Operating-System Services – System Calls – System Programs – Virtual Machines.

Unit II

12 Hours

Processes : Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter Process Communication.

CPU Scheduling: Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple Processor Scheduling – Real time Scheduling – Algorithm Evaluation.

Unit III

12 Hours

Process Synchronization: Background – Critical Section Problem – Semaphores – Classical Problems of Synchronization - Critical Regions – Atomic Transactions.

Deadlocks: System Model – Deadlock Characterization - Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection - Recovery from Deadlock.

Unit IV

12 Hours

Memory Management: Background – Swapping – Contiguous Memory Allocation – Paging – Segmentation – Segmentation with Paging.

Virtual Memory: Background – Demand Paging – Page Replacement – Allocation of Frames.

Unit V

12 Hours

File-System Interface: File Concept – Access Methods – Directory Structure

File System Implementation: File System Structure – Directory Implementation – Allocation Methods.

Mass Storage Structure: Disk Structure - Disk Scheduling.

TEXT BOOK:

Operating System Concepts – Abraham Silberschartz , Peter Baer Galvin , and Greg Gange.

Addison Wesley Publishing Company – Sixth Edition.

REFERENCE BOOK:

1. Operating Systems: Internal and Design Principles – Fifth Edition, William Stalling ,PHI Learning Private Limited.
2. Understanding Operating Systems: Ida M. Flynn, Ann McIverMcHoes.

COMPUTER NETWORKS AND DATA COMMUNICATIONS

Unit I

12 Hours

Basic model of Data Communication system – Data Representation – data Transmission – Modes of Data Transmission – Digital Signal Encoding – Unipolar and Polar Line Codes – Bipolar Line Codes – Block Codes – Frequency spectrum - Transmission Channel –Data Compression – Data Communication.

Transmission Line Characteristics – Linear Distortions – Metallic Media – Optical Fibre – Radio Media – Baseband Transmission of Data Signals.

Unit II

12 Hours

Transmission Errors – Coding for Detection and Correction of content Errors – Error Detection Methods – Forward Error Correction Methods – Reverse Error Correction.

Topology of a Computer Network – Elements of Meaningful Communication - Transport-Oriented Functions – Components of a Computer Network – Architecture of a Computer Network – Layered Architecture of a Computer Network – Open System Interconnection – Layered Architecture of the OSI Reference Model – Functionality of the Layered Architecture – OSI Terminology – Service Interface – Data Transfer Modes – Supplementary Functions – Other Layered Architectures.

Unit III

12 Hours

The Physical Layer – Functions within the Physical Layer – Relaying Function in the Physical Layer – Physical Interface – Physical Layer Standards.

Need for Data Link Control –Data Link Layer – Frame Design Considerations – Flow Control Mechanism – Data Link Error Control.

Binary Synchronous Communication Data Link Protocol -Transmission Frame – Protocol Operation.

Unit IV

12 Hours

Need for Local Area Networks –Lan Topologies - Media Access Control – Layered Architecture of LAN – IEEE Standards – LLC Sublayer – MAC Sublayer – Transmission Media for LANs.

Contention Access - Carrier Sense Multiple Access – CSMA/CD – Physical Topology of Ethernet LAN – Ethernet Repeater - Types of Ethernets – 10 Mbps Ethernets – Fast Ethernet – Flow Control –Auto Negotiation – Gigabit Ethernet

Unit V

12 Hours

Security Requirements – Cryptography Algorithms – Algorithms for Confidentiality - Algorithms for Integrity –Basic Authentication Mechanisms – Mechanisms for Ensuring Message Integrity – Digital Signature – Management of Public Keys Through Third Parties – Transport Layer Security –IP Security – Firewalls.

TEXT BOOK:

1. “DATA COMMUNICATIONS AND COMPUTER NETWORKS “ –PRAKASH C. GUPTA – PHI - 2011.
 - UNIT I - Chapters 1&2 [Except 2.10, 2.11, 2.12]
 - UNIT II - Chapters 5 & 6
 - UNIT III - Chapters 7.1 to 7.5, 8.1 to 8.5, 9.1 to 9.3
 - UNIT IV - Chapters 10 & 11
 - UNIT V -Chapter 21

REFERENCE BOOK:

1. Data Communications and Networking, Behrouz A Forouzan, 4th Edition, McGraw Hill.
2. Computers Networks, Andrew S. Tanenbaum, 4th Edition, PHI.
3. Computer Networks, Brijendra Singh, Third Edition, PHI
4. Computer Networks, Bhushan Trivedi, OXFORD University Press

DATA MINING

Unit I

12 Hours

Introduction: What is Data Mining – why Data Mining Now - The Data Mining Process – Data Mining Applications - Data Mining Techniques – Some Data Mining Case Studies – The Feature of Data Mining – Guidelines for Successful Data Mining - Data Mining Software.

Unit II

12 Hours

Association Rule Mining : Introduction – Basics – The Task and Naïve Algorithm – The Apriori Algorithm – Improving the efficiency of the Apriori Algorithm - Mining Frequent Patterns without Candidate Generation – Performance Evaluation of Algorithms – Software for Association Rule Mining.

Unit III

12 Hours

Classification : Introduction – Decision Tree – Building a decision Tree The Tree Induction Algorithm – Split Algorithm Based on the Information Theory – Decision Tree Rules – Decision tree Summary – Naïve Bayes Method – Other Evaluation Criteria for Classification Methods – Classification Software.

Unit IV

12 Hours

Cluster Analysis: What is Cluster Analysis – Desires Features of Cluster Analysis – Types of Data – Computing Distance – Types of Cluster Analysis Methods - Partitional Methods – Hierarchical Methods – Dealing with Large Databases – Cluster Analysis Software

Unit V

12 Hours

Web Data Mining : Introduction – Web Technology and characteristics – Locality and Hierarchy in the Web – Web Content Mining – Web Usage Mining – Web Structure Mining – Web mining Software.

TEXT BOOK :

1. Introduction to Data Mining with Case Studies, G.K. Gupta, PHI Second Edition, 2012.

REFERENCE BOOK:

1. **Data Mining Concepts & Technologies**, Jiawei Han, Micheline Kamber, Morgan Kaufmann, Second Edition, 2005.
2. **Data Mining**, Vikram Pudi, P.Radha Krishna, OxfordUniversity Press, First Edition, 2009.
3. **Data Warehousing** – Reema Thareja Oxford University Press – 2009.
4. **Insight into Data Mining Theory and Practice** – K.P. Soman, Shyam Diwakar, V.Ajay, Prentice Hall of India – 2008.

RELATIONAL DATA BASE MANAGEMENT SYSTEM

UNIT I

12 hours

Introduction:

Database - system applications-Purpose of Database Systems - View of Data- Database languages -Relational Databases - Database Design - Data Storage and Querying - Transaction Management - Database Architecture - Data Mining and Information Retrieval-Specialty Databases - Database Users and Administrators

UNIT II

12 hours

Introduction to the Relational Model and Introduction to SQL

Structure of Relational Databases -Database Schema-Keys-Schema Diagrams-Relational Query Languages-Relational Operations- Overview of the SQL Query Language -SQL Data Definition-Basic Structure of SQL Queries

UNIT III**12 hours**

SQL operations and Intermediate SQL

Additional Basic Operations-Set Operations-Null values-Aggregate functions-
Nested Subqueries-Join Expressions – Views - Transactions-Integrity Constraints -
SQL Data Types and Schemas-Authorization

UNIT IV**12 hours****E-R Model and Relational Database Design:**

E-R Model-Overview of the Design Process-The Entity-Relationship model -
Constraints - Removing Redundant Attributes in Entity Sets-Entity – Relationship
Diagrams-Reduction to Relational Schemas-Entity- Relationship Design Issues-
Extended E-R Features

Features of Good Relational Designs-Atomic Domains and First Normal Form-
Decomposition Using Functional Dependencies-Functional --Decomposition using
Multivalued Dependencies-More Normal Forms

UNIT V**12 hours****Implementation using Oracle:**

Creating Table-Modifying Table-Creating SEQUENCE-creating Views-PL/SQL-
triggers-Stored procedures and Functions-packages-cursors

TEXT BOOK:

- 1.Database System Concepts – Abraham Silberschalz, Henry F.Horth and S.Sudarashan, McGraw-Hill International Sixth Edition.
2. Oracle8i Jose A.Ramalho BPB Publications

REFERENCE BOOK:

1. Database Management Systems, R.Panneerselvam, PHI Learning Private Limited
- 2.Database Management Systems, Ramakrishnan and Gehrke, Mc Graw Hill Publications

RDBMS - ORACLE – PRACTICAL LIST

1. Create an employee database with tables department, employee details, address, pay details and project details. Alter the tables and add constraints relevant to the fields in the tables. Insert records into all the tables.
2. Create queries to retrieve relevant information from a table.
3. Create a table from the existing tables. Create views from the tables.
4. Develop queries to retrieve information from more than one table. Develop summary queries to retrieve relevant information from the tables.

5. Create a partition table and query the records.
6. Create the table with abstract data type and query the records.
7. Write a PL/SQL program to print multiplication table
8. Write a PL/SQL program to check whether given string is palindrome or not
9. Write a PL/SQL program to print student details using Report
10. Create a procedure to calculate Electricity bill (use cursor)
11. Write a PL/SQL program to perform updation using various triggers
12. Write a PL/SQL program to find factorial of numbers using function and procedure.

SOFTWARE DEVELOPMENT LAB

Data Structure

Any two problems

(Example:

1. Comparison and Implementation of Sorting Algorithms
2. Comparison and Implementation of Searching algorithms)

Resource Management Techniques

Any two problems

(Example:

3. Formation of LPP and Solving LPP
4. Application of LPP in Game Theory)

Web Technology

Any two problems

(Example:

5. Develop a web site for your college
6. Develop a Simple Quiz master)

Computer Graphics

Any two problems

(Example:

7. Implementation of basic transformations
8. Implementation of viewing transformation)

Visual Basic

Any two problems

(Example:

9. Pay roll design

10. Library management)

Operating Systems

Any one problem

(Example:

11. Implementation of any three scheduling algorithms)

Computer Networks and Data Communications

Any one problem

(Example:

12. Implementation of routing algorithm)

Oracle

Any one problem

(Example:

13. Office Automation using Oracle as Back End)

14. Any one problem from each other subject in the syllabi.

APPENDIX – AZ49

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI -12

B.Sc SOFTWARE ENGINEERING (CBCS)

REGULATIONS AND SYLLABUS (2012-2013)

The **aims** of the Programme are:

- To impart theoretical and practical knowledge that underpins the various areas of computer science
- To impart basic computing skills & a selected set of skills that is currently in demand in IT field
- To impart the selected set of soft skills that are required for a computer professional in the global era
- To stimulate interest in humanities and thereby encourage an inter-disciplinary interest
- To create an awareness on social, ethical and professional issues related to computers

The **objectives** of the Programme are the following: On completion of the Programme, a student should:

- Manage the hardware and software components in a computer system independently and bloom either as a programmer in software industries
- Have sound skills in designing databases and managing them
- Have sound skills in designing web-based applications
- Have a good command of the English language for professional communication
- Have a variety of soft skills like technical documentation, presentation, quality awareness, team work, global outlook etc
- Be aware of professional, ethical and social issues in the IT field.
- Have experience in successful completion of a medium sized real-life project in a team environment, in a time bound manner

1. **Qualifications for Admission:**

Candidate should have passed the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Government of Tamil Nadu or any other Examinations accepted by the syndicate as equivalent thereto with Mathematics / Computer Science as one of the subjects.

2. **Duration of the Course:**

The students shall undergo the prescribed course of study for a period of not less than three academic years (Six semesters).

3. **Medium of Instruction:** English.

4. Subjects of Study:

The subject offered is given in Appendix A.

5. Scheme of Examination:

a. The passing minimum is 40%. i.e., minimum 30 marks in external
(Internal + External = 40 marks).

b. Practical Examinations at the end of even semester

6. Structure of question paper (Theory):

Every question paper shall consist of three parts.

First part will carry **10 marks**, the question will be of Objective type. Each question carries 1 mark and candidates have to answer all **10 questions**.

Second part will carry **25 marks**, candidates have to answer **5 questions**, each question will be of either (or) type.

Third part will carry **40 marks**, candidates have to answer **5 questions**, each will be of either (or) type.

Total 75 marks with Three hours duration.

7. Computer Facility:

The College should provide with sufficient number of computers to the students as per the requirements of the syllabus

8. Eligibility for the degree:

(i) A candidate shall be eligible for the award of the degree on completion of the prescribed course of study and passing all the prescribed external examinations.

(ii) Attendance, progress and conduct certification from the head of the institution shall be required for taking the external examinations.

(iii) The passing minimum is 40% and a candidate will be declared to have passed

(a) In I class if he / she has obtained 60% and above in the III part

(b) In II class if he / she has secured 50% and above but less than 60%

(c) In III class if he / she has secured 40% and above but less than 50%

(iv) The maximum period for the candidate to complete the UG course is 6 years.

Ranking will be made for the candidates who have successfully completed the course without any arrears in each semester with the candidates scored the maximum total in III part be put in the I Rank and the minimum total in III part be put in the last Rank.

9. Industrial visit:

Industrial visit may be arranged by the department for getting experience in successful completion of a medium sized real-life project in a team environment, in a time bound manner to a maximum of five working days.

10. Software Development Skill:

The objective of the Software development skill is to encourage group discussion and to enable the students, to work in convenient groups of not more than four members in a group, on a software development lab involving some design and fabrication work or theoretical and experimental studies related to computer science subjects studied during their course.

MANONMANIAM SUNDARANAR UNIVERSITY
B.Sc SOFTWARE ENGINEERING (CBCS)

From 2012-2013 onwards

FIRST SEMESTER

<u>SUBJECT TITLE</u>	<u>LECTURE</u> <u>Hours</u>	<u>LAB</u> <u>Hours</u>	<u>Credits</u>
Part I -Language	6 hrs	---	3
Part II- ENGLISH	6 hrs	---	3
Part III Core 1: Theory Introduction to Computers and Programming in C	6 hrs	---	4
Core 2: Practical Programming in C	---	4 hrs	4
Allied I: Theory Discrete Mathematics	4 hrs	---	2
Allied 2 : Practical Office Automation	--	2 hrs	--
Part IV: Environmental Studies	2	--	2
Total (5T+1P Courses)	24	6	18
<u>SECOND SEMESTER</u>			
Part I -Language	6 hrs	---	3
Part II- ENGLISH	6 hrs	---	3
Part III Core 3: Theory Object Oriented programming using C++	6 hrs	---	4
Core 4: Practical OOP using C++	--	4 hrs	4

Allied 3 : Theory Digital Design	4 hrs	---	4
Allied 4 : Practical Office Automation	---	2 hrs	4
Part IV : Value based Education	2	--	2
Total (5T+2P Courses)	24	6	24
<u>THIRD SEMESTER</u>			
Part III : Core 5: Theory Computer Architecture	6 hrs	---	4
Core 6: Theory Java Programming	6 hrs	---	4
Core 7: Practical Java Programming	---	6 hrs	4
Allied 5: Theory Data Structure	4 hrs	---	4
Allied 6: Practical Data Structure Lab	---	2 hrs	--
Part IV: Skilled Based Subjects Internet Fundamentals (OR) Flash	1hr	3 hrs	4
Non Major Elective I Introduction to Computers (OR) Programming in C	2 hrs	---	2
Total (5T+1P Courses)	19	11	22

<u>FOURTH SEMESTER</u>			
Part III: Core 8: Theory Visual Basic	6 hrs	---	4
Core 9: Theory – Elective I Microprocessor (OR) Software Testing (OR) Introduction to Open Source	6 hrs	---	5
Core 10 : Practical Visual Basic	---	6 hrs	4
Allied 7: Theory Resource Management Techniques	4 hrs	---	4
Allied 8 : Practical Data Structure	---	2 hrs	2
Part IV: Skilled Based Subject - Common	4 hrs	--	4
Non Major Elective II Basic Program Design (OR) C++ Programming	2 hrs	---	2
Part V : Extension Activity	---	---	1
Total (5T+2P Courses)	22	8	26
FIFTH SEMESTER			
Part III: Core 11: Theory Software Engineering	4 hrs	---	4
Core 12: Theory Computer Graphics & Multimedia	4 hrs	---	4

Core 13 : Theory Web Technology	4 hrs	---	4
Core 14: Theory – Elective II Software Project Management (OR) Artificial Neural Network (OR) ASP.NET	6 hrs	---	5
Core 15 : Practical Computer Graphics & Multimedia Lab	---	8 hrs	4
Part IV: Skilled Based Subject II PC Troubleshooting (OR) UML	1hr	3 hrs	4
Total (5T+1P Courses)	19	11	25
<u>SIXTH SEMESTER</u>			
Core 16: Theory Operating Systems	4 hrs	---	4
Core 17: Theory Computer Networks and Data Communications	4 hrs	---	4
Core 18: Theory Data Mining	4 hrs	---	4
Core 19: Theory RDBMS	4 hrs	---	4
Core 20: Practical RDBMS	---	8 hrs	4
Core 21: Practical Software Development Lab	---	6 hrs	5
Total (5T+1P Courses)	16	14	25

Total number of courses : 38 (30T+8P)
Total number of hours : 180
Total number of credits : 140

Distribution of marks between External and Internal Assessment in Theory is 75 : 25; in Practical 60 : 40.

Pass Minimum of 40% for External and overall Components.

Software Development Lab: External - 60 marks & Internal (Project Report)-40 marks.

Appropriate Major / Allied related, 'Allied Courses' and 'Skill Based Courses' may be chosen by the major departments, taking into account the total work-load of the department.

COMPUTER ARCHITECTURE

Unit I **18 hours**

Basic Computer Organization:

Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle – Control Memory – Address Sequencing

Unit II **18 hours**

CPU:

General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Program control

Unit III **18 hours**

Computer Arithmetic:

Hardware Implementation and Algorithm for Addition, Subtraction, Multiplication, Division – Booth Multiplication Algorithm – Floating Point Arithmetic

Unit IV **18 hours**

I/O and Memory Organization:

I/O Interface – Asynchronous Data Transfer – Modes of I/O Transfer – Priority Interrupt – Direct Memory Access - Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory

Unit V

18 hours

Advanced Processing:

RISC, CISC Characteristics - Parallel Processing – Pipe Lining – vector processing – array processors – Multi processors – Interconnections structures

TEXT BOOK:

M. Morris Mano, “Computer System Architecture”, Third Edition, Reprint 2003 Pearson Education.

REFERENCE BOOK:

1.Nirmala Sharma, “Computer Architecture”, First Edition,2009, University Science Press

2.Nicholas Carter, “Computer Architecture”, 2006, TMH Publication

JAVA PROGRAMMING

UNIT I

18 hours

Data Types, Variables and Arrays: Primary types – Integers – Floating point types – Characters – Booleans – A Closer Look at Literals – Variables – Type Conversion and Casting – Automatic type Promotion in Expressions - One Dimensional Arrays– Multi Dimensional Arrays.

Operators: Arithmetic Operators – Bitwise operators – Relational Operators – Boolean Logical Operators – Assignment Operator – Conditional Operator – Operator Precedence-Using parentheses.

Unit II

18 hours

Introducing Classes: Class Fundamentals – Declaring Objects – Assigning Object Reference Variables – Introducing Methods – Constructors – Garbage Collection – finalize() Method.

A Closer Look at Methods and Classes: Overloading Methods – Using Objects as Parameters – Argument Passing – Returning Objects – Recursion – Introducing Access Control – Understanding static – Introducing final – Nested and Inner classes – String Class – Using command line arguments.

Inheritance: Inheritance Basics – Using super – Creating Multilevel Hierarchy-Method Overriding-Dynamic Method Dispatch – Using Abstract classes – Using final with Inheritance – The Object class.

Unit III**18 hours**

Packages and Interfaces: Packages – Access Protection – Importing Packages – Interfaces.

Exception Handling: Introduction – Exception Types – Using try and catch – Multiple catch Clauses – Nested try Statements – throw – throws – finally

Multithreaded Programming: Java Thread Model – Main Thread – Creating a Thread – Creating Multiple Threads – Using isAlive () and join() – Thread Priorities.

Unit IV**18 hours**

The Applet Class: Applet Basics – Applet Architecture – Applet Skeleton – Applet Display Methods – Requesting Repainting – HTML APPLET tag – Passing Parameters to Applet.

Event Handling: Event Handling Mechanisms – Delegation Event Model – Event Classes – Sources of Events – Event Listener Interfaces – Handling Mouse Events and Keyboard Events.

Unit V**18 hours**

Introducing the AWT: AWT Classes – Window fundamentals – Working with Frame Windows-Working with Graphics – Working with color – Working with Fonts

Using AWT Controls: Controls Fundamentals – Labels – Using Buttons – Applying Check Boxes – Check Box Group – Choice Controls – Using a TextField –Using a Text Area – Understanding Layout Managers – [Flow Layout Only] – Menu Bars and Menus-Dialog Boxes.

TEXT BOOK:

Java, The Complete Reference 8/e , Herbert Schildt, TMH

REFERENCE BOOK:

1. Java Programming A Practical Approach, C.Xavier, TMH
2. Programming in Java, Sachin Malhotra, Saurabh Choudhary, OXFORD University Press
3. Core Java, Mahesh P. Matha, PHI Learning Private Limited

JAVA - PRACTICAL LIST

1. Define a class called Student with the attributes Name, Reg-Number and Marks Obtained in four subjects(m1,m2,m3,m4).Write a suitable constructor and methods to find the total mark obtained by the student and display the details of the student.
2. Write a Java program to find the area of a square, rectangle and triangle by
 - (i) Overloading Constructor
 - (ii) Overloading Method.
3. Write a java program to add two complex numbers.[Use passing object as argument and return object].
4. Define a class called Student with data members name, roll number and age. Write a suitable constructor and a method output () to display the details.

Derive another class Student1 from Student with data members height and weight.

Write a constructor and a method output () to display the details which overrides the super class method output().[Apply method Overriding concept].
5. Write a java program to create a package “Student” which contains the classes Emp and Memp. The data members of Emp are name, emp_id, category and Bpay. Write suitable constructors and methods to compute net pay of the employee. The class Memp contains the main method.
6. Write a java program to create an interface called Demo, which contains a double type constant, and a method called area () with one double type argument.
Implement the interface to find the area of a circle.
7. Write a java program to create a thread using Thread class.
8. Write a java program to Design a calculator to perform only addition and division. It must contains three Buttons with labels +, / and =, and a TextField to get input and display the result.
9. Create an applet with four Checkboxes with labels MARUTI-800, ZEN, ALTO and ESTEEM and a Text area object. The program must display the details of the car while clicking a particular Checkbox.
10. Write a Java program, which creates a window with a check box group with boxes for the colors, Violet, Indigo, Yellow, Orange, Red, Blue, and Green. When the button is selected the background colour must change accordingly.
11. Write a Java program to throw the following exception,
 - 1) Negative Array Size
 - 2) Array Index out of Bounds
12. Write a java program to create a file menu with options New, Save and Close, Edit menu with option cut, copy and paste.

DATA STRUCTURE

UNIT I

12 hours

Introduction and Overview:

Definitions – Concept of Data Structures – Overview of Data Structures – Implementation of Data Structures – Organization of the Book

Arrays and Tables:

Definition – Terminology – One – Dimensional Array – Multidimensional Arrays
Tables:-Rectangular Tables – Jagged Tables – Inverted Tables – Hash Tables – Problems to Ponder

UNIT II

12 hours

Linked Lists:

Definition – Single Linked List – Circular Linked List – Double Linked Lists – Circular Double Linked List – Applications of Linked Lists – Memory Representation – Boundary Tag System – De allocation Strategy

UNIT III

12 hours

Stacks and Queues:

Introduction – Definition – Representation of a Stack – Operations on Stacks – Applications of Stacks –Queues: Introduction – Definition – Representation of Queues – Various Queue structures

UNIT IV

12 hours

Trees:

Basic Terminologies – Definition and concepts – Representations of Binary Tree – Operations on a Binary Tree – Types of Binary Trees – Expression Tree-Binary Search Tree-Heap Trees

UNIT V

12 hours

Graphs:

Introduction – Graph Terminologies – Representation of Graphs – Operations on Graphs – Application of Graph Structures – Quick Sort-Merge Sort

TEXT BOOK:

Classic Data Structures, Debasis Samantha, PHI Learning Private Limited

REFERENCE BOOK:

1. Data Structures, A pseudo code approach with C++, Richard F. Gilberg and Behrouz A. Forouzon, Thomson Publications.
2. Data Structures Using C++, Varsha H. Patil, OXFORD University Press

DATA STRUCTURES – PRACTICAL LIST

1. Write a C++ program to implement sequential search and binary search in array.
2. Write a C++ program to implement linked list and perform the following operations
 - a. Add a node as first node
 - b. Add a node as last node
3. Write a C++ program to implement linked list and perform the following operations
 - a. Delete the first node
 - b. Delete the last node
4.
 - a. Write a C++ program to implement a stack using linear list perform the push and pop operations
 - b. Write a C++ program to implement a queue using circular list and implement add and delete operations.
5. Write a C++ program to implement binary tree using linked and perform the following traversal.
 - a. In order Traversal
 - b. Pre order Traversal
 - c. Post Order Traversal
6. Write a C++ program to implement graph using Adjacency matrix and perform the following operations.
 - a. Depth First search
 - b. Breadth First search
7. Write a C++ program to implement merge sort
8. Write a C++ program to implement Quick sort.

INTERNET FUNDAMENTALS

1. Finding the IP address of a system using DOS and windows operating systems.
2. E-mail creation.
3. How to configure outlook express.
4. How to stop pop up- pop under Internet Advertisements.
5. How to enable-disable -delete internet cookies.
6. How to determine the speed of My Internet Connection(Transfer rate when downloading a file).
7. Changing the home page of my browser.

8. Creation of Internet favourites/bookmark.
9. How to install internet security.
10. How to ping another node.
11. How to install the following web browsers: Opera, Fire box, Safari.
12. Creation of a simple web page.

FLASH

1. Transformation of objects
2. Create an animation of an Image
3. Create new buttons.
4. Loading an external video file
5. Creating motion of object
6. Drag a movie clip using script.
7. Create scrollbars in a text.

INTRODUCTION TO COMPUTERS

Unit : I

6Hrs

Number System : Number System – Base of System, Types of Number System – Conversion Between Number Bases: Conversion of Decimal to Binary – Binary to Decimal – Decimal to Octal – Octal to Decimal - Binary to Octal – Octal to Binary – Decimal to Hexadecimal – Hexadecimal to Decimal - Binary to Hexadecimal and Hexadecimal to Binary.

Logic Gates : Basic Logic Gates, NAND and NOR gates only.

Unit II

6Hrs

Introduction to Computers: Introduction – Characteristics of Computers – Evolution of Computers - Generation of Computers – Classification of Computers : Based on purpose, Based on type of data handling techniques, and According to Functionality – The Computer System – Application of Computers.

Unit III

6Hrs

Input Devices: Keyboard – Pointing Devices – Webcam – Scanners – Optical Character Recognition – Optical Mark recognition – Magnetic Ink Character Recognition – Bar Code Reader.

Output Devices: Printers – Plotters – Computer Output Microfilm – Monitors – Voice Recognition System – Projectors.

Unit IV**6Hrs**

Primary memory: Memory Representation – Memory Hierarchy – Random Access Memory – Read Only memory – Types of ROM.

Secondary Storage: Classification of Secondary Storage Devices – Storage Organization of Magnetic Disk – Storage Organization of Optical Disk – Magneto-Optical Disk – Universal Serial Bus.

Unit V**6Hrs**

Data Communication: Data Communication Components, Data Transmission Mode, Data Communication Measurement

Computer Network: LAN, WAN and MAN – Network Topologies – Network Devices: Network Interface Card, Hub, Repeater, Switch, Bridge, Router and Gateway.

Internet Basics: Basic Internet Terms – Internet Applications – E-mail.

TEXT BOOK:

Introduction to Computer Science, IITL Education Solutions Limited, 2/e, Pearson

REFERENCE BOOK:

1. Fundamentals of Computers, V.Rajaram, 5th Edition, PHI
2. Introduction to Computers, Peter Norton, 7/e, TMH.

PROGRAMMING IN C**Unit I****6 Hrs**

Introduction to C: The C Character set – Identifiers and keywords – Data types – Constants – Variables – Declaration of variables.

Operators and Expressions: Arithmetic Operators – Relational and Logical Operators – Assignment Operators – Increment and Decrement operators - The Conditional Operator

Unit II**6 Hrs**

Data Input and Output: Formatted Input and Output only [ie., scanf() and printf() only].

Control Statements: The if statement - if-else Statement – nested –if - The for loop Statement (only) –The Switch Statement – The goto Statement.

Unit III**6 Hrs**

Arrays: Declaration of one dimensional array - Processing an Array – two dimensional array.

Pointers: Pointer Declarations – Simple pointer expressions - Pointers and One Dimensional Arrays.

Unit IV

6 Hrs

User-Defined Functions: Defining a Function – Function calls – Return values and their types – Function declaration – Function with argument and return type (only) – Recursion.

Unit V

6 Hrs

Structures : Defining a Structure – Processing a Structure

File Management in C: Defining and Opening a File – Closing a file – Input and Output operations on file.

Text Books

Programming in ANSI C , Fifth Edition, E.Balafurusamy, Tata McGraw Hill Education Private Limited

Reference Books

1. Computer Fundamentals and Programming in C, Reema Thareja, Oxford University Press
2. How to Program C, Sixth Edition, Paul Deitel and Harvey Deitel, PHI Learning Private Limited
3. Programming with ANSI and Turbo C, First Edition, Ashok N. Kamthane, Pearson Education

VISUAL BASIC**Unit I****18 hours**

Getting started with Visual Basic 6.0: Introduction to Visual Basic - Visual Basic 6.0 Programming Environment – Working with Forms – Developing an Application – Variables, Data types and Modules – Procedures and Control Structures – Arrays in Visual Basic – Additional Examples.

Working with Controls: Introduction – Creating and using Controls – Working with Control Arrays – Additional Examples.

Unit II**18 hours**

Menus, Mouse Events and Dialog Boxes: Introduction – Mouse Events – Dialog Boxes - additional Examples.

Graphics, MDI, and Flex Grid: Introduction – Graphics for Applications – Multiple Document Interface(MDI) – Using the Flex Grid Control - Additional Examples.

Unit III**18 hours**

ODBC and Data Access Objects: Evolution of Computer Architectures – Data Access Options - Additional Examples.

ODBC using Data Access Objects and Remote Data Objects: Open Database Connectivity (ODBC) – Remote Data Objects – Additional Examples.

Unit IV

18 hours

Data Environment and Data Report: Introduction – Data Environment Designer – Data Report - Additional Examples.

Object Linking and Embedding: Introduction - OLE Fundamentals – Using OLE Container Controls – Using OLE Automation Objects - OLE Drag and Drop - Additional Examples.

Objects and Classes: Introduction to Objects – Working with Objects – Classes and Class Modules - Additional Examples.

Unit V

18 hours

Built-In ActiveX Controls: Working with Built-In ActiveX Controls - Additional Examples.

Working with ActiveX Data Objects: An Overview of ADO and OLE DB – ADO Object Model - Additional Examples.

Files and File System Controls: Introduction – File System Controls – Accessing Files – Interface with Windows - Additional Examples.

Text Book:

Visual Basic 6.0 Programming – Content Development Group – Tata McGraw-Hill Publishing Company Limited, New Delhi.

Reference Books:

1. VISUAL BASIC 6 in Record Time by Steve Brown, BPB Publications.
2. VISUAL BASIC 6 from the Ground UP – GARY CORNELL – Tata McGraw Hill.

VISUAL BASIC - PRACTICAL LIST

1. Design an Analog Clock.
2. Design a Desktop Calculator.
3. Design Mixing of Colors using basic Colors.
4. Create an application to format the text inside the text box.
5. Create an application using File controls and use two option buttons to show and hide a picture in the Picture box.
6. Create an application to do Matrix Addition using Flex Grid control.
7. Create an Editor with File and Edit Menus using Menu Editor Tool.
8. Create a MDI Application with tile and cascade child forms.
9. Create an application to implement OLE Drag and Drop.
10. Create a mailing address database in access and view the records using Data Control.
11. Create a student database application using ADO.
12. Create a student database in Access and prepare a Report using Data Report Control.

MICROPROCESSOR

UNIT I

18 hours

Microprocessors, Microcomputers and Assembly language

Microprocessors-Microprocessor Instruction set and Computer languages-From large computer to single chip microcontrollers.

Introduction to assembly Language Programming-The 8085 Programming Model

Instruction classification – Instruction, Data format and storage-How to write, assemble and execute simple program. Overview of 8085 instruction set –Writing and hand assembling a program

UNIT II

18 hours

Microprocessor Architecture and micro computer systems

Microprocessor Architecture and its operations-Memory-Input and output (I/O)

Devices-Example of a microcomputer system.

8085 Microprocessor Architecture and Memory Interfacing : The 8085 MPU-Example of an 8085 based microcomputer –memory interfacing –interfacing the 8155 memory segment

UNIT III

18 hours

Introduction to 8085 instructions

Data transfer instruction-Arithmetic operations-Logic operations-Branch operations-Writing an assembly language programs – Debugging a program.

Programming Techniques with additional instructions

Programming Techniques: Looping, Counting and Indexing –Additional Data transfer and 16 bit instructions-arithmetic operations related to memory-Logic operation –Rotate-Compare-Dynamic Debugging.

UNIT IV

18 hours

Counters and Time Delays –Hexadecimal counter-Modulo ten counter-Generating pulse waveforms-Debugging counter and time delay programs.

Stack and Subroutine: Stack-Subroutine-Restart-Conditional call and Return instructions –advanced subroutine concepts.

UNIT V**18 hours**

BCD to Binary Conversion-Binary to BCD Conversion –BCD to seven segment LED Conversion-BCD addition –BCD subtraction-multiplication-subtraction with carry.

TEXT BOOK:

Microprocessor Architecture Programming and Applications with the 8085, Ramesh S Goankar, Fifth edition, Penram International publisher.

REFERENCE BOOK:

- 1.8085 Microprocessor Programming and interfacing, N.K.Srinath, PHI Publication.
2. Microprocessors and Microcontrollers, N. Senthil Kumar, M.Saravanan, S. Jeevananthan, Oxford University Press.

SOFTWARE TESTING**UNIT I****18 hours****Introduction**

Testing as an Engineering Activity – Role of Process in Software Quality – Testing as a Process – Basic Definitions – Software Testing Principles – The Tester’s Role in a Software Development Organization – Origins of Defects – Defect Classes – The Defect Repository and Test Design – Defect Examples – Developer/Tester Support for Developing a Defect Repository.

UNIT II**18 hours****Test Case Design**

Introduction to Testing Design Strategies – The Smarter Tester – Test Case Design Strategies – Using Black Box Approach to Test Case Design Random Testing – Requirements based testing – positive and negative testing – Boundary Value Analysis – decision tables - Equivalence Class Partitioning state-based testing– causeeffect graphing – error guessing - compatibility testing – user documentation testing –domain testing Using White–Box Approach to Test design – Test Adequacy Criteria –static testing vs. structural testing – code functional testing - Coverage and Control Flow Graphs – Covering Code Logic – Paths – Their Role in White–box Based Test Design –code complexity testing – Evaluating Test Adequacy Criteria.

UNIT III

18 hours

Levels Of Testing

The Need for Levels of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests. The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – scenario testing – defect bash elimination -System Testing – types of system testing - Acceptance testing – performance testing - Regression Testing – internationalization testing – ad-hoc testing - Alpha – Beta Tests – testing OO systems – usability and accessibility testing

UNIT IV

18 hours

Test Management

People and organizational issues in testing – organization structures for testing teams – testing services - Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process - Reporting Test Results – The role of three groups in Test Planning and Policy Development – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group.

UNIT V

18 hours

Controlling And Monitoring

Software test automation – skills needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation- Test metrics and measurements – project, progress and productivity metrics – Status Meetings – Reports and Control Issues – Criteria for Test Completion – SCM – Types of reviews – Developing a review program – Components of Review Plans– Reporting Review Results. – evaluating software quality – defect prevention – testing maturity model

TEXT BOOKS:

1. Srinivasan Desikan and Gopalaswamy Ramesh, “ Software Testing – Principles and Practices”, Pearson education, 2006.
2. Aditya P.Mathur, “Foundations of Software Testing”, Pearson Education,2008.

REFERENCES:

1. Boris Beizer, “Software Testing Techniques”, Second Edition,Dreamtech, 2003
2. Elfriede Dustin, “Effective Software Testing”, First Edition, Pearson Education, 2003.
3. Renu Rajani, Pradeep Oak, “Software Testing – Effective Methods, Tools and Techniques”, Tata McGraw Hill, 2004.

INTRODUCTION TO OPEN SOURCE SOFTWARE

Unit I

18 hours

History and Emergence of Open Source Software: The philosophy of OSS, Richard Stallman, The Cathedral and the Bazaar (CatB), commercial software vs OSS, free software vs freeware. Open source development models. Application Programming Interface (API). GNU Project, Free Software Foundation.

Unit II

18 hours

Community Building: Importance of Communities in Open Source Movement. JBoss Community. Developing blog, group, forum, social network for social purpose.

Unit III

18 hours

Open Standards: National Information Standards Organization (NISO), The Digital Library Federation (DLF). The Dublin Core Metadata Initiative. MARC standards, Resource Description and Access (RDA). Open Archives Initiative. OAI-PMH. Search / Retrieval via URL (SRU), SRW/CQL. Java Platform, Enterprise Edition (Java EE).

Unit IV

18 hours

Open Source Licenses: GNU General Public License (GPL) version 2,3, GNU Lesser General Public License (LGPL) version 2.1,3, GNU Affero General Public License (AGPL) version 3, Apache License, Version 2.0, ArtisticLicense2.0,etc.
Operating System: The Linux operating system and its use both for desktops and as server software.

Unit V

18 hours

Webserver: Apache HTTP Server and its flavors. WAMP server (Windows, Apache, MySQL, PHP). Open Source MySQL. Apache, MySQL, PHP, JAVA as development platform.

Open Source Software: Category of Open Source Software. OSS for podcasts, RDBMS, online social networks, etc. open source bibliometric softwares like pajek,ucinet,etc.

REFERENCES:

1)	http://directory.fsf.org/GNU/
2)	http://www.diglib.org
3)	http://www.entirelyopensource.com/
4)	http://www.niso.org/
5)	The Dublin Core Metadata Initiative < http://dublincore.org/ >
6)	MARC standards < http://www.loc.gov/marc/ >
7)	Resource Description and Access (RDA) < http://www.rdaonline.org/ >

8)	WAMP server (Windows, Apache, MySQL, PHP) < http://www.wampserver.com/en/ >
9)	Open Source MySQL < http://www.mysql.com/ >
10)	Search / Retrieval via URL (SRU) < http://www.loc.gov/standards/sru/ >
11)	< http://www.loc.gov/standards/ >
12)	< http://iesr.ac.uk/use/sru/ >
13)	< http://java.sun.com/javaee/ >
14)	< http://www.jboss.org/ >

RESOURCE MANAGEMENT TECHNIQUES

Unit I

12 hours

Linear Programming Problem (LPP) - Mathematical Formulation of L.P.P- Simplex Method - Maximization.

Unit II

12 hours

Game Theory- Mixed strategies- saddle point- Dominance Property- Graphical method- Method of solving 2xn game-Method of solving nx2 game- Application of L.P.P in Game theory.

Replacement Problem- Individual replacement- Groups replacement- model I
Replacement of an item whose maintenance cost increases with time and money value is not changed.

Unit III

12 hours

Queuing Theory- Poisson Process - Model I (M|M|1): (∞ |FIFO) - Generalisation Model.

Unit IV

12 hours

Inventory Control- Various Costs- Deterministic Model- Probabilistic or stochastic- Model I-Model II- No shortage- Model III with shortage- Newspaper boy problem.

Unit V

12 hours

Network Analysis- CPM- Determination of Critical path and Project Duration- PERT- Time estimates- Variance for activities.

TEXT BOOK:

Operations Research, P. R. Vital and V. Malini, Margham Publications.

REFERENCE BOOK:

1. Operations Research Principles and Practice, Pradeep Prabhakar Pai, OXFORD University Press.
2. Operations Research, R.Panneerselvam, PHI.

BASIC PROGRAM DESIGN

Unit I

6Hrs

Computer Program: Introduction – Developing a program – Algorithm – Flowchart – Decision Tables – Pseudocode.

Unit II

Program Testing and Debugging – Program Documentation – Program Paradigms: Unstructured programming, Structured programming and Object Oriented Programming – Characteristics of a Good Programming.

Unit III

6Hrs

Computer Languages: Evolution Programming Languages – Classification of Programming Languages – Generation of Programming Languages – Features of Good Programming language.

Unit IV

6Hrs

Computer Software: Software Definition – Relationship between Software and Hardware - Software Categories : System Software and Application Software – Terminology Software Firmware, Liveware, Freeware, Public Domain Software, Shareware, Commercial Software and Proprietary Software.

Unit V

6Hrs

Operating System: Definition – Evolution of Operating System – Types of Operating System – Functions of Operating System – Modern Operating System: Windows XP and Windows 7.

TEXT BOOK:

Introduction to Computer Science, IITL Education Solutions Limited, 2/e, Pearson

REFERENCE BOOK:

1. Fundamentals of Computers, V.Rajaram, 5th edition, PHI
2. Introduction to Computers, Peter Norton, 7/e, TMH.

C++ PROGRAMMING

Unit I

Classes and Objects:

6 Hrs

classes in C++ - declaring objects – the public keyword – the private keyword – the protected keyword – defining member functions – characteristics of member functions – inline function.

Unit II

Constructors and destructors: 6 Hrs

constructors and destructors – characteristics of constructors and destructors – constructors with arguments – overloading constructors – constructors with default arguments - constructor and destructor with static members.

Unit III

Operator overloading and type conversion: 6 Hrs

The keyword operator – overloading unary operator – operator return type – overloading binary operators - rules for overloading operators.

Inheritance:

Access specifiers and simple inheritance – single inheritance and multiple inheritance only.

Unit IV

Pointers and Arrays: 6 Hrs

Pointer declaration - pointer to object – the this pointer

Polymorphism and Virtual functions: Pointer to derived class objects- Virtual Functions - Rules for Virtual Functions

Unit V

Files: 6 Hrs

File stream classes – steps of file operations – checking for errors – finding end of a file – file opening modes – file pointers and manipulators – manipulators with arguments – sequential read and write operations

Text Book:

Object-Oriented Programming with ANSI & Turbo C++, Ashok N. Kamthane, 2009, Pearson Education

Reference Books:

1. Programming with ANSI C++, Bhushan Trivedi, 2010, OXFORD University Press
2. Object Oriented Programming C++, E. Balagurusamy, 4th Edition, Tata McGraw Hill Education Private Limited
3. C++ and object oriented programming paradigm, Debasish Jana, 2nd Edition, PHI Learning Private Limited

SOFTWARE ENGINEERING

UNIT I

12 hours

Introduction – Software Engineering Discipline – Evolution and Impact – Programs Vs Software Products – Emergence of Software Engineering – Changes in Software Development Practices – Computer Systems Engineering. Software Life Cycle Models: Use of a Life Cycle Models – Classical Waterfall Model – Iterative Waterfall Model – Prototyping Model – Evolutionary Model – Spiral Model. Software Project Management: Responsibilities of a Software Project Manager – Project Planning – Metrics for Project Size Estimation – Project Estimation Techniques –Risk Management – Software Configuration Management.

UNIT II

12 hours

Requirements Analysis and Specification: Requirements Gathering and Analysis –Software Requirements Specification (SRS) – Formal System Development Techniques; Software Design: Characteristics of a Good Software Design – Cohesion and Coupling –Neat Arrangement – Software Design Approaches.

UNIT III

12 hours

Function-Oriented Software Design: Overview of SA/SD Methodology – Structured Analysis – Data Flow Diagrams (DFDs) – Structured Design - Detailed Design – Design Review. Object Modeling Using UML: Overview of Object-Oriented Concepts – UML – UML Diagrams – Use Case Model – Class Diagrams – Interaction Diagrams – Activity Diagrams – State Chart Diagram.

UNIT IV

12 hours

User Interface Design: Characteristics of a Good User Interface – Basic Concepts – Types of User Interfaces – Component-Based GUI Development; Coding and Testing: Coding – Testing – UNIT Testing – Black-Box Testing – White-Box Testing – Debugging –Integration Testing – System Testing.

UNIT V

12 hours

Statistical Testing –Software Quality – Software Quality Management System – ISO 9000. Computer Aided Software Engineering: CASE Environment – CASE support in Software Life Cycle – Characteristics of CASE Tools –Architecture of a CASE Environment. Software Maintenance: Characteristics of Software Maintenance – Software Reverse Engineering – Software Maintenance Process Models – Estimation of Maintenance Cost; Software Reuse: Issues in any Reuse Program – Reuse Approach.

TEXT BOOK:

Fundamentals of Software Engineering - RAJIB MALL, Prentice Hall of India Learning Private Limited, 2008.

REFERENCE BOOK:

1. SOFTWARE ENGINEERING CONCEPTS, Richard Fairley, TMH.
2. OBJECT ORIENTED SOFTWARE ENGINEERING, Yogesh Singh, Ruchika Makhotra, PHI Learning Private Limited
3. Software Engineering, Principles and Practices, Depak Jain, OXFORD University Press

COMPUTER GRAPHICS AND MULTIMEDIA**Unit I****12 hours**

Overview of Graphics System: Video Display Devices – Input Devices - Hard Copy Devices – Graphics Software.

Output Primitives: Points and Lines –Line drawing algorithms – DDA algorithm- Bresenham's line algorithm- Circle drawing algorithms: properties of circles – Midpoint circle algorithm – Filled Area primitives.

Unit II**12 hours**

Attributes of Output Primitives: Line attributes – Curve attributes – Character attributes.

Two-Dimensional Geometric Transformation: Basic Transformations – Matrix Representations and homogenous co-ordinates – Composite and other Transformations.

Unit III**12 hours**

Two-Dimensional Viewing: The viewing pipeline, Viewing co-ordinate reference frame – Window to view port co-ordinate transformation – Two-dimensional viewing function.

Clipping Operations: Point clipping – Line clipping (only Cohen-Sutherland line clipping) – Polygon Clipping (only Sutherland-Hodgeman polygon clipping).

Unit IV**12 hours**

Interactive Input Methods: Input of graphical data – Input functions – Three dimensional display methods.

Three Dimensional Viewing: Projections. Visible surface deduction methods: Back-face deduction – Depth buffer method.

Unit V

12 hours

Multimedia Introduction: What is Multimedia? – Hardware components of a Multimedia system.

Multimedia Elements: Text and Graphics – Sound – Animation – Video – Issues and trends in Multimedia.

TEXT BOOK:

1. Computer Graphics, Second Edition, Donald Hearn, M. Pauline Baker, Pearson Publications. Chapters: 2.1, 2.6, 2.7, 3.1, 3.2, 3.5, 4.1, 4.2, 4.5, 5.1 to 5.4, 6.1 to 6.8, 8.2, 8.3, 9.1, 12.3, 13.2, 13.3.
2. Multimedia in Action, James E. Shumman, Vikas Publishing House, Chapters 1 to 4 and 12.

REFERENCE BOOK:

1. Computer Graphics, Apurva Desai, Prentice Hall of India, 2012
2. Principles of Interactive Graphics, William M. Newman, Robert F. Sproull 1979, McGraw Hill.
3. Desk top Multimedia Bible, Burger 1993, Addison Wesley.
4. Prabhat Andleigh, Kiran Thakrar, Multimedia System and Design, Prentice Hall of India, 2000.

WEB TECHNOLOGY

Unit I

12 Hours

Introduction: What is the Internet-History of Internet-Internet Services and Accessibility-Uses of the Internet-Protocols-Web concepts-The client/server model at the web-Retrieving data from the web. Internet Protocols: Introduction – Internet protocols-transmission control protocols-User Datagram protocols - Host Names - Internet applications and application protocols.

Unit II**12 Hours**

HTML: Introduction-SGML-DTD-DTD Elements- attributes-outline of an HTML document-Head section-Body section-HTML forms-Dynamic HTML: Introduction-cascading style sheets-DHTML Document object model and collections-Event handling - filters and transitions.

Unit III**12 Hours**

Javascript: Introduction-language elements-objects of Javascript-other objects-Arrays. VBScript: Introduction-embedding VBScript code in an HTML document-comments-variables-operators-procedures-conditional statements-looping constructs-objects & VBScripts-Cookies.

Unit IV**12 Hours**

Introducing PHP & MYSQL: Features of PHP & MYSQL- Architecture- sample application-using valuables, statements & operators: Embedding PHP in HTML-statement & comments-storing values in variables-simple data types-various operators to manipulate & compare variables-operator precedence.

Unit V**12 Hours**

Conditional statement & loops: conditional statements-merging forms-Repeating actions with loops: while(), do(), for() loop-break & continue.

Arrays & custom functions: Create Array-modify array element-processing array with loops-Grouping form selections with arrays-using array functions.

TEXT BOOK:

1. **Web Technology**, N.P Gopalan, J.Akilandeswari, PHI,2009

Unit I: chapters 1, 2

Unit II: chapters 4, 7

Unit III: chapters 5, 6.

2. **How to do Everything with PHP & MYSQL**, Vikram Vaswans, Tata MCGraw-Hill 2005.

Unit IV: chapters 1, 3.

Unit V: chapters 4, 5.

REFERENCE BOOK:

Web Technology, S. Padma Priya, SCITECH Publications (India) Pvt. Ltd.

COMPUTER GRAPHICS AND MULTIMEDIA LAB

- 1 Write a program to translate an image
- 2 Write a program to rotate an image
- 3 Write a program to scale an image
- 4 Write a program to draw a line using DDA Algorithm
- 5 Write a program to draw a line using Bresenham's Algorithm
- 6 Write a program to draw a circle using Bresenham's Algorithm
- 7 Write a program to tiled or cascade a image according user option
- 8 Write a program to display an image as size of screen ,then reduces its size until disappears
- 9 Write a program to drop a word by word of a sentence from top
- 10 Write a program to display a news headlines letter by letter
- 11 Write a program to display as many as balls at random positions
- 12 Write a program to display a bouncing ball and moving with sound effect

SOFTWARE PROJECT MANAGEMENT

UNIT I

18 hours

Introduction – Importance of Software Project Management – Project – Software Project Vs Other types of Project – Contract Management and Technical Project Management – Activities covered by Software Project Management – Plans, Methods and Methodologies – Categorizing Software Projects –Setting Objectives – Stake holders – Business Case – Requirement specification – Management control. Step wise: An overview of Project Planning: Introduction – Ten steps. Programme management and project evaluation: Introduction – Programme management – Managing the allocation of resources within programmes – Strategic Programme management – Creating a Programme – Aids to Programme management – Benefits Management – Evaluation of Individual Projects – Technical Assessment – Cost Benefit Analysis – Cash Flow forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation.

UNIT II

18 hours

Selection of an appropriate project approach: Introduction – Choosing Technologies – Technical plan contents list – Choice of process models – Structure Vs Speed of delivery – The Waterfall model – The V-Process Model – The Spiral Model – Software Prototyping – Other ways of categorizing prototypes – Incremental Delivery – Dynamic Systems Development method – Extreme Programming – Managing iterative processes – Selecting the most appropriate process model.

Software Cost Estimation: Introduction – Where are estimates done? – Problems with over and under estimates – Basis for software estimating – Software effort estimation techniques – Expert Judgement – Estimating by analogy – Albrecht function point analysis – Function points Mark II – COSMIC Full function points – A Procedure code oriented approach – COCOMO: a Parametric model

UNIT III

18 hours

Activity Planning: An Introduction – Objectives of Activity Planning – When to plan – Project Schedules – Projects & Activities – Sequencing and scheduling activities – Network planning models – Formulating a network model – Adding the time dimension – The forward pass – The backward pass – Identifying the critical path – Activity float – Shortening the project duration – Identifying critical activities – Activity on arrow networks.

Risk Management: Introduction – Risk – Categories of Risk – A framework for dealing with this – Risk Identification – Risk Assessment – Risk Planning – Risk Management – Evaluating risks to the schedule – Applying the PERT Technique – Monte Carlo simulation – Critical Chain concepts.

Resource Allocation: Introduction – The Nature of Resources – Identifying resource requirements – Scheduling resources – Creating Critical paths – Counting the cost – Being specific – Publishing the resource schedule – Cost Schedule – The Scheduling Sequence.

UNIT IV

18 hours

Monitoring and Control: Introduction – Creating the framework – Collecting the data – Visualizing Progress – Cost Monitoring – Earned Value Analysis – Prioritizing monitoring – Getting the project back to target – Change control.

Managing Contracts: Introduction – ISO 12207 approach to the acquisition and supply of software – The supply process – Type of contract – Stages in Contract placement – Typical terms of a contract – Contract Management – Acceptance.

UNIT V

18 hours

Managing people and Organizing terms: Introduction – Understanding Behavior – Organizational Behavior: a background – Selecting the right person for the job – Instruction in the best methods – Motivation – The Oldham-Hackman job characteristics model – Working in groups – Working in groups – Becoming a team – Decision making – Leadership – Organizational Structures – Dispersed and Virtual team – The influence of culture – Stress – Health & Safety.

Software Quality: Introduction – The place of Software quality in project planning – The importance of software quality – Defining Software quality – ISO 9126 – Practical Software Quality Measures – Product Vs Process Software quality management – External Standards – Techniques to help enhance software quality – Quality Plans.

TEXT BOOK:

Software Project Management, Bob Hughes and Mike Cotterell, Tata Mc Grawhill, Fourth edition, 2006.

REFERENCE BOOK:

1. Software Project Management, A Concise Study, S.A.Kelkar, PHI, 2007

ARTIFICIAL NEURAL NETWORKS

Unit I

18 hours

Introduction to Neural networks: Neural processing- Neural networks- an overview – the raise of neuro computing – introduction to artificial neural networks : introduction-artificial neural networks – historical development of neural networks – biological neural networks – comparison between the brain and the computer – artificial and biological neural networks – basic building blocks of artificial neural networks – artificial neural network terminologies.

Unit II

18 hours

Fundamental models of artificial neural networks: McCulloch-Pits neuron Model-Learning rules.
Perceptron networks: Introduction –single layer perceptron –brief introduction to multi layer perceptron networks.

Unit III

18 hours

Feed back networks: Introduction- discrete Hopfield net-continuous Hopfield net-relation between BAM and Hopfield nets.

Feed forward networks: introduction-back propagation networks.

Unit IV

18 hours

Kohonen self - organizing feature maps - counter propagation network: introduction-Full counter propagation network-Forward only propagation network.

Unit V

18 hours

Applications of Neural Networks: Applications of neural networks in Arts-Bioinformatics - Knowledge Extraction – Forecasting - Bankruptcy forecasting-Healthcare-Intrusion - Detection.

TEXT BOOK:

Introduction to Neural Networks using MATLAB 6.0., S N Sivanandam S Sumathi S N Deepa Tata McGraw Hill, 2006

REFERENCE BOOK:

- 1.Artificial neural Networks B.Yegnanarayana, Prentice Hall India, 2005
- 2.Neural Networks Alogorithms, Applications and programming Techniques, James A Freeman David M Skapura, Pearson Education.
- 3.Neural Networks for Pattern Recognition, Christopher M. Bishop, Indian Edition, OXFORD University Press

ASP.NET

UNIT I

18 Hours

The .NET Framework and .NET Languages

The .NET Programming Framework - VB.NET , C# and the .NET languages - VB.NET versus VBScript and Visual Basic 6 - The Common Language Runtime - The .NET Class Library-ASP.NET - Visual Studio. NET

The .NET Languages - Data Types - Declaring Variables - Scope and Accessibility - Variable Operations –Object - Based Manipulation - Functions and Subroutines

UNIT II

18 Hours

Types, Objects and Namespaces

The Basics about Classes - Value Types and Reference Types - Advanced Class Programming - Understanding Namespaces and Assemblies

Setting up ASP.NET and IIS

Web Servers and You-IIS Manager-Installing ASP.NET- Migrating from

ASP

UNIT III

18 Hours

ASP.NET Applications

ASP.NET Applications - Code-Behind - The Global.asax Application File - Understanding ASP.NET Classes - ASP.NET Configuration

Web Form Fundamentals

A Simple Page Applet-Improving the Currency Converter - A Deeper Look at HTML Control Classes-The Page Class - Assessing HTML Server Controls

UNIT IV

18 Hours

Web Controls

Stepping up to web controls - Web Control Classes - AutoPostBack and Web Control Events - A Simple Web Page Applet-Assessing Web Controls

Using Visual Studio .NET

The Promise of Visual Studio.NET - Starting a Visual Studio .NET Project - The Web Form Designer-Writing code - Visual Studio.NET Debugging - Working Without Visual Studio.NET

UNITV**18Hours****Validation and Rich controls**

Validation - A Simple Validation Example-Understanding Regular Expressions

State Management

The Problem of state – View state - Transferring Information - Custom Cookies - Session state - Session state Configuration - Application state

Overview of ADO.NET

Introducing ADO.NET and Data Management-Characteristics of ADO.NET-The ADO.NET Object Model

TEXT BOOK:

The complete reference ASP.NET, Matthew MacDonald, Tata McGraw-Hill Edition 2002

REFERENCE BOOK:

Microsoft ASP.NET 4, George Shepherd, PHI Publications

PC TROUBLE SHOOTING –PRACTICAL LIST

1. Assembling a Computer.
2. Partitioning and Formatting Hard Disk.
3. Configuring a PC.
 - a) CMOS Setup.
 - b) Jumper Settings.
 - c) Switch Settings.
4. Memory Upgrading.
5. Testing Monitor and Keyboard (Types of Monitors and Monitor Signals)
6. Fault Finding on Mother Board Slots.
7. Testing Serial Port and Parallel Port.
8. Fault Finding on Driver Installation, Booting Problem
9. Testing of Computer SMPS (AC Supply, DC Supply, Proper earth to Neutral Voltage)
10. FDD Fault Finding.
11. HDD, CD ROM Fault Finding.
12. Installing Antivirus Software.
13. Identifying PC Problem by Applying Layman Checkup Procedure.

UML LAB
(Use UML Tools)

- 1) Draw the Use Cases and define all the classes for Automatic Teller Machine
- 1) Draw the Use Cases and define all the classes for Employee Management System.
- 3) Draw the Use Cases and define all the classes for Library Management System.
- 4) Draw the Use Cases and define all the classes for Bus Reservation System.
- 5) Draw the Sequence and Collaboration diagrams for Automatic Teller Machine.
- 6) Draw the Sequence and Collaboration diagrams for Employee Management System.
- 7) Draw the Sequence and Collaboration diagrams for Library Management System.
- 8) Draw the Sequence and Collaboration diagrams for Bus Reservation System.
- 9) Draw the state Transition Diagrams and Class Diagrams for Automatic Teller Machine.
- 10) Draw the state Transition Diagrams and Class Diagrams for Employee Management System.
- 11) Draw the state Transition Diagrams and Class Diagrams for Library Management System.
- 12) Draw the state Transition Diagrams and Class Diagrams for Bus Reservation System.
- 13) Draw the Component Deployment Model for Automatic Teller Machine.
- 14) Draw the Component Deployment Model for Employee Management System.
- 15) Draw the Component Deployment Model for Library Management System.
- 16) Draw the Component Deployment Model for Bus Reservation System.

OPERATING SYSTEM

Unit I

12 Hours

Introduction: Operating System – Mainframe Systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real-time Systems.

Operating System Structures: System Components – Operating-System Services – System Calls – System Programs – Virtual Machines.

Unit II

12 Hours

Processes : Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter Process Communication.

CPU Scheduling: Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple Processor Scheduling – Real time Scheduling – Algorithm Evaluation.

Unit III

12 Hours

Process Synchronization: Background – Critical Section Problem – Semaphores – Classical Problems of Synchronization - Critical Regions – Atomic Transactions.

Deadlocks: System Model – Deadlock Characterization - Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection - Recovery from Deadlock.

Unit IV

12 Hours

Memory Management: Background – Swapping – Contiguous Memory Allocation – Paging – Segmentation – Segmentation with Paging.

Virtual Memory: Background – Demand Paging – Page Replacement – Allocation of Frames.

Unit V

12 Hours

File-System Interface: File Concept – Access Methods – Directory Structure

File System Implementation: File System Structure – Directory Implementation – Allocation Methods.

Mass Storage Structure: Disk Structure - Disk Scheduling.

TEXT BOOK:

Operating System Concepts – Abraham Silberschartz , Peter Baer Galvin , and Greg Gange.

Addison Wesley Publishing Company – Sixth Edition.

REFERENCE BOOK:

1. Operating Systems: Internal and Design Principles – Fifth Edition, William Stalling ,PHI Learning Private Limited.
2. Understanding Operating Systems: Ida M. Flynn, Ann McIverMcHoes.

COMPUTER NETWORKS AND DATA COMMUNICATIONS

Unit I

12 Hours

Basic model of Data Communication system – Data Representation – data Transmission – Modes of Data Transmission – Digital Signal Encoding – Unipolar and Polar Line Codes – Bipolar Line Codes – Block Codes – Frequency spectrum - Transmission Channel –Data Compression – Data Communication.

Transmission Line Characteristics – Linear Distortions – Metallic Media – Optical Fibre – Radio Media – Baseband Transmission of Data Signals.

Unit II

12 Hours

Transmission Errors – Coding for Detection and Correction of content Errors – Error Detection Methods – Forward Error Correction Methods – Reverse Error Correction.

Topology of a Computer Network – Elements of Meaningful Communication - Transport-Oriented Functions – Components of a Computer Network – Architecture of a Computer Network – Layered Architecture of a Computer Network – Open System Interconnection – Layered Architecture of the OSI Reference Model – Functionality of the Layered Architecture – OSI Terminology – Service Interface – Data Transfer Modes – Supplementary Functions – Other Layered Architectures.

Unit III

12 Hours

The Physical Layer – Functions within the Physical Layer – Relaying Function in the Physical Layer – Physical Interface – Physical Layer Standards.

Need for Data Link Control –Data Link Layer – Frame Design Considerations – Flow Control Mechanism – Data Link Error Control.

Binary Synchronous Communication Data Link Protocol -Transmission Frame – Protocol Operation.

Unit IV

12 Hours

Need for Local Area Networks –Lan Topologies - Media Access Control – Layered Architecture of LAN – IEEE Standards – LLC Sublayer – MAC Sublayer – Transmission Media for LANs.

Contention Access - Carrier Sense Multiple Access – CSMA/CD – Physical Topology of Ethernet LAN – Ethernet Repeater - Types of Ethernets – 10 Mbps Ethernets – Fast Ethernet – Flow Control –Auto Negotiation – Gigabit Ethernet

Unit V**12 Hours**

Security Requirements – Cryptography Algorithms – Algorithms for Confidentiality - Algorithms for Integrity –Basic Authentication Mechanisms – Mechanisms for Ensuring Message Integrity – Digital Signature – Management of Public Keys Through Third Parties – Transport Layer Security –IP Security – Firewalls.

TEXT BOOK:

1. “DATA COMMUNICATIONS AND COMPUTER NETWORKS “–PRAKASH C. GUPTA – PHI - 2011.
 - UNIT I - Chapters 1&2 [Except 2.10, 2.11, 2.12]
 - UNIT II - Chapters 5 & 6
 - UNIT III - Chapters 7.1 to 7.5, 8.1 to 8.5, 9.1 to 9.3
 - UNIT IV - Chapters 10 & 11
 - UNIT V -Chapter 21

Reference Books:

1. Data Communications and Networking, Behrouz A Forouzan, 4th Edition, McGraw Hill.
2. Computers Networks, Andrew S. Tanenbaum, 4th Edition, PHI.
3. Computer Networks, Brijendra Singh, Third Edition, PHI
4. Computer Networks, Bhushan Trivedi, OXFORD University Press

DATA MINING**Unit I****12 Hours**

Introduction: What is Data Mining – why Data Mining Now - The Data Mining Process – Data Mining Applications - Data Mining Techniques – Some Data Mining Case Studies – The Feature of Data Mining – Guidelines for Successful Data Mining - Data Mining Software.

Unit II**12 Hours**

Association Rule Mining : Introduction – Basics – The Task and Naïve Algorithm – The Apriori Algorithm – Improving the efficiency of the Apriori Algorithm - Mining Frequent Patterns without Candidate Generation – Performance Evaluation of Algorithms – Software for Association Rule Mining.

Unit III**12 Hours**

Classification : Introduction – Decision Tree – Building a decision Tree The Tree Induction Algorithm – Split Algorithm Based on the Information Theory – Decision Tree Rules – Decision tree Summary – Naïve Bayes Method – Other Evaluation Criteria for Classification Methods – Classification Software.

Unit IV**12 Hours**

Cluster Analysis: What is Cluster Analysis – Desires Features of Cluster Analysis – Types of Data – Computing Distance – Types of Cluster Analysis Methods - Partitional Methods – Hierarchical Methods – Dealing with Large Databases – Cluster Analysis Software

Unit V**12 Hours**

Web Data Mining : Introduction – Web Technology and characteristics – Locality and Hierarchy in the Web – Web Content Mining – Web Usage Mining – Web Structure Mining – Web mining Software.

TEXT BOOK :

1. Introduction to Data Mining with Case Studies, G.K. Gupta, PHI Second Edition, 2012.

REFERENCE BOOK:

1. **Data Mining Concepts & Technologies**, Jiawei Han, Micheline Kamber, Morgan Kaufmann, Second Edition, 2005.
2. **Data Mining**, Vikram Pudi, P.Radha Krishna, OxfordUniversity Press, First Edition, 2009.
3. **Data Warehousing** – Reema Thareja Oxford University Press – 2009.
4. **Insight into Data Mining Theory and Practice** – K.P. Soman, Shyam Diwakar, V.Ajay, Prentice Hall of India – 2008.

RELATIONAL DATA BASE MANAGEMENT SYSTEM**UNIT I****12 hours****Introduction:**

Database - system applications-Purpose of Database Systems - View of Data- Database languages -Relational Databases - Database Design - Data Storage and Querying - Transaction Management - Database Architecture - Data Mining and Information Retrieval-Specialty Databases - Database Users and Administrators

UNIT II**12 hours****Introduction to the Relational Model and Introduction to SQL**

Structure of Relational Databases -Database Schema-Keys-Schema Diagrams-Relational Query Languages-Relational Operations- Overview of the SQL Query Language -SQL Data Definition-Basic Structure of SQL Queries

UNIT III**12 hours**

SQL operations and Intermediate SQL

Additional Basic Operations-Set Operations-Null values-Aggregate functions-Nested Subqueries-Join Expressions – Views - Transactions-Integrity Constraints - SQL Data Types and Schemas-Authorization

UNIT IV**12 hours****E-R Model and Relational Database Design:**

E-R Model-Overview of the Design Process-The Entity-Relationship model - Constraints - Removing Redundant Attributes in Entity Sets-Entity – Relationship Diagrams-Reduction to Relational Schemas-Entity- Relationship Design Issues-Extended E-R Features

Features of Good Relational Designs-Atomic Domains and First Normal Form-Decomposition Using Functional Dependencies-Functional --Decomposition using Multivalued Dependencies-More Normal Forms

UNIT V**12 hours****Implementation using Oracle:**

Creating Table-Modifying Table-Creating SEQUENCE-creating Views-PL/SQL-triggers-Stored procedures and Functions-packages-cursors

TEXT BOOK:

- 1.Database System Concepts – Abraham Silberschalz, Henry F.Horth and S.Sudarashan, McGraw-Hill International Sixth Edition.
2. Oracle8i Jose A.Ramalho BPB Publications

REFERENCE BOOK:

1. Database Management Systems, R.Panneerselvam, PHI Learning Private Limited
- 2.Database Management Systems, Ramakrishnan and Gehrke, Mc Graw Hill Publications

RDBMS - ORACLE – PRACTICAL LIST

1. Create an employee database with tables department, employee details, address, pay details and project details. Alter the tables and add constraints relevant to the fields in the tables. Insert records into all the tables.
2. Create queries to retrieve relevant information from a table.
3. Create a table from the existing tables. Create views from the tables.
4. Develop queries to retrieve information from more than one table. Develop summary queries to retrieve relevant information from the tables.
5. Create a partition table and query the records.
6. Create the table with abstract data type and query the records.
7. Write a PL/SQL program to print multiplication table
8. Write a PL/SQL program to check whether given string is palindrome or not
9. Write a PL/SQL program to print student details using Report
10. Create a procedure to calculate Electricity bill (use cursor)
11. Write a PL/SQL program to perform updation using various triggers
12. Write a PL/SQL program to find factorial of numbers using function and procedure.

SOFTWARE DEVELOPMENT LAB

Data Structure

Any two problems

(Example:

1. Comparison and Implementation of Sorting Algorithms
2. Comparison and Implementation of Searching algorithms)

Resource Management Techniques

Any two problems

(Example:

3. Formation of LPP and Solving LPP
4. Application of LPP in Game Theory)

Web Technology

Any two problems

(Example:

5. Develop a web site for your college

6. Develop a Simple Quiz master)

Computer Graphics

Any two problems

(Example:

7. Implementation of basic transformations

8. Implementation of viewing transformation)

Visual Basic

Any two problems

(Example:

9. Pay roll design

10. Library management)

Operating Systems

Any one problem

(Example:

11. Implementation of any three scheduling algorithms)

Computer Networks and Data Communications

Any one problem

(Example:

12. Implementation of routing algorithm)

Oracle

Any one problem

(Example:

13. Office Automation using Oracle as Back End)

14. Any one problem from each other subject in the syllabi.

APPENDIX – AZ50

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI -12

B.Sc. Degree Course in Information Technology (CBCS).

Full-Time - 6 Semesters

Syllabus for III & VI Semester.

With Effect From academic year (2012-2013).

Title Of The Subject		Teaching Hours.	Credits
III SEMESTER			
Part III Core	Major - III Principles of Information Technology	6	4
	Major - IV Advanced Java Programming.	6	4
	Major Practical - III Advanced Java Programming-Lab	6	4
Part IV	Skill Based Subject – I (DTP)	4(1T & 3P)	4
	Non - Major Elective - I	2	2
	Allied Subject - II Theory - Data Structure	4	2
	Allied Practical - Data Structure	2	2
	Total	30	22
IV SEMESTER			
Part III Core	Major - V Relational Database Management System	6	4
	Major Practical - IV Relational Database Management System Lab	6	4
Part IV	Common Skill Based Subject	4	4
	Non - Major Elective - II	6	2
	Major Elective - I (Group - A)	6	5
	Allied Subject - II Operations Research & Numerical Analysis	4	4
	Allied Practical - Data Structure	2	2
Part V	Extension Activity		1
	Total	30	26

V SEMESTER			
Part III Core	Major - VI .Net Programming	4	4
	Major - VII Software Engineering	4	4
	Major - VIII Operating System	4	4
	Major Practical - V .Net Programming Lab	8	4
	Major Elective - II (Group - B)	6	5
Part IV	Skill Based Subject – II (Animation Application)	4(1T & 3P)	4
	Total	30	25
VI SEMESTER			
Part III Core	Major - IX Data Communications And Networking	4	4
	Major - X Multimedia Technology	4	4
	Major - XI Wireless Application Protocol	4	4
	Major - XII Web Programming	4	4
	Major Practical - VI Web Programming Lab	8	4
	Major Practical- VII Software Developing	6	5
	Total	30	25

Major Elective	
Major Elective - I (Group - A)	Management Information System.
	E-Commerce.
	Enterprise Resource Planning.
Major Elective - II (Group - B)	Artificial Intelligence.
	System Programming.
	Embedded System.

Major Theory : Principles Of Information Technology

UNIT – I:

Introduction – Data – Information – Technology – Information Technology – Evolving Wireless Application – Communication Basics – Powers of 10 – Frequency – Frequency Spectrum – Wavelength – Bandwidth – Bandwidth – Power Measurements – Transmission Rate Constraints – Radiofrequency Spectrum Allocation.

UNIT – II:

AMPS – Evolution – Components – Network Access – Frequency Utilization – Signalling – Data Over Amps – Case Study – DAMPS – Overview – TDMA – Digital Radio – Voice Coding Methods – TDM Operation – The IS – 136 Digital Control Signal.

UNIT – III:

PCS – Overview – Layered Model – Messaging – Modem Operations – GSM – Evolution – Frequency Allocation – Services – Frequency Allocation – TDMA Operations – Speech Coding – Framing and Channel Organisation – Data over GSM – Information Transfer Modes – Inbound Data/Fax – Data Compression – SMS.

UNIT – IV:

CDMA – Evolution – Overview – Channel Structure – Data Services – 3G CDMA – The WAP Protocol Suite – Overview – WDP – WTLS – WAE – WML – LMDS – Overview – Frequency Allocation – Architecture – System Capacity – Advantages – Disadvantages.

UNIT – V:

MMDS – Overview – Frequency Assignments – Transmission Methods – Bluetooth – Rationale – Evolution – Comparison with IR – System Architecture – Communication Channels – Wireless LAN's – Characteristics – Applications – The IEEE 802.11 Wireless LAN standard.

Text Books :

1. Gil Held, "*Data Over Wireless Networks*", Tata McGraw – Hill Edition 2001.

Reference :

1. Jennifer Bray, Charles F. Sturman, "Bluetooth 1.1 Connect with cables" Low Price Edition, Pearson Education
2. Vijay K. Garg, "*IS – 95 CDMA and CDMA2000: Cellular/PCS System Implementation*", Low Price Edition, Pearson Education
3. Vijay K. Garg, Joseph E. Wilkes, "*Principles and Applications of GSM*", Low Price Edition, Pearson Education

Major Theory : Advanced Java Programming.

UNIT – I:

The Genesis of Java – Overview of Java – Development of Java – JDE – Data Types – Variables – Arrays – Type Conversion and Casting – Operators –Precedence – Control Statements.

UNIT – II:

Introducing Classes – Objects – OOP,s Concepts – Declaring Objects – Introducing Methods – Constructors – Overloading – this keyword – Garbage collection – finalize() method – More Examples.

Objects as parameter – returning objects – recursion – Access Control – static – final – Nested and Inner classes – Command line arguments – Sample Programs.

UNIT – III:

String and String Buffer Class Inheritance – Types of Inheritance – Method Overriding – Dynamic method Dispatch – Abstract Class – Final with Inheritance – More Examples.

Packages – Access Protection – Importing Packages – Interfaces – Implement and Applying Interfaces – Sample Programs.

UNIT – IV:

Exception Handling – Exception Types – Our Own Exception – Handling Exception – Java’s Built in Exception – Thread Class and Runnable Interface – Extending Thread – Creating Multiple Threads – isAlive() and join() methods – Synchronization – suspend(),resume() and stop() threads – Example Programs

I/O packages – Input Stream – Output Stream – File Input and Output Stream – Applet Class – An Applet Skeleton – Simple Applet Display Methods – Example Programs

UNIT – V:

Event Handling – Delegation Event Model – Event classes – Sources of Events – Event Listener Interface – AWT controls – Labels – Buttons – Check Boxes – Check Box Group – Lists – Scroll Bar – Text Area – Menu Bars and Menu – Lay out Managers – Examples

Text Book :

1. Herbert Schildt, “*Java 2*”, Fourth Edition, Tata McGraw – Hill Publishing Company Ltd New Delhi .

Reference :

1. Peter Norton and William Stanek, “*Guide To Java Programming*”, Techmedia,New Delhi
2. Martin RineHart, ”Java Database Development”,ed – 1998, Tata McGraw – Hill Publishing Company Ltd New Delhi .

Major Practical : Advanced Java Programming – Lab list.

1. Create a Simple program with your own detail.
2. Use Overload(i) Method (ii) Constructor
3. Create a Program for object as parameters and returning objects.
4. Create a program with abstract class.
5. Create a program Using Multilevel Inheritance.
6. Develop a Program using Interface
7. Create and Import package(Minimum Three classes)
8. Create Our Own Exception for Employees.(Constraints 1.Age>18 and<58) 2. Dept No 10||20||30||40)
9. Suspend,Resume and Stop Threads(Minimum 3 Threads)
10. Read and write the content of a file using I/O package
11. Display a Simple Banner Applet
12. Event Handling Mechanism for Key board and Mouse
13. Create a Login form.
14. Simple Web Presentation using HTML tag(Use 3 Pages)
15. Create a Program for Movig Ball(Start and Stop)
16. Create a simple Java database with 4 fields.

Allied Theory : Data Structures.

Unit – I:

Introduction and Overview – Definitions – Concept of Data Structures – Overview of Data Structures – Implementation of Data Structures. Arrays – One – dimensional Array – Memory allocation of an Array – Operation on Arrays – Application of Arrays – Multidimensional Arrays – Two – dimensional Array – Sparse Matrices – Three – dimensional and n – dimensional Arrays – Pointer Arrays.

Unit – II :

Linked Lists – Definition – Single Linked List – Representation of a Linked List in memory – Operations on a Single Linked List – Circular Linked List – Double Linked List – Operations on a Double Linked List – Circular Double Linked List – Operations on Circular Double Linked List – Applications of Linked List – Sparse Matrix Manipulation –Polynomial Representation – Dynamic Storage Management – Memory Representation – Fixed Block Storage – Variable Block Storage.

Unit – III:

Stacks – Definition – Representation of a Stack – Array Representation of Stacks – Linked List Representation of Stacks – Operation on Stacks – Application of Stacks – Evolution of Arithmetic Expressions – Implementation of Recursion – Factorial Calculation – Quick Sort.

Queues – Definition – Representation of Queues – Representation of Queues using an Array – Representation of a Queue using a Linked List – Various Queue Structures – Circular Queue – Deque – Priority Queue.

Unit – IV

Tables – Hash Tables – Hashing Techniques – Collision Resolution Techniques – Closed Hashing – Open Hashing – Comparison of Collision Resolution Techniques.

Representation of Binary Tree – Linear Representation of Binary Tree – Linked Representation of Binary Tree – Physical Implementation of a Binary Tree in Memory – Operation on a Binary Tree – Insertion – Deletion – Traversals – Merging together Two Binary Trees – Types of Binary Trees – Expression Tree – Binary Search Tree – Heap Tree – Threaded Binary Tree.

Unit – V:

Sorting – Sorting Techniques – Straight Insertion sort – Straight Selection Sort – Heap Sort – Bubble Sort – Shell Sort – Quick Sort – Merge sort. Searching – Linear Search Techniques – Linear Search with Array – Linear search with Linked List – Linear search with Ordered List – Binary Search.

Text Book:

1. “Classic Data Structures” Debasis Samanta, PHI Learning Private Limited, New Delhi, 2009 Second Edition.

Allied Practical : Data Structures – Lab List.

1. Search an element in an array using Binary Search.
2. Stack implementation using array
3. Queue implementation using array
4. To manipulate a linked list
5. Infix to postfix conversion.
6. Evaluation of Postfix expression.
7. Tree traversal.
8. Merge sort
9. Selection sort
10. Quick sort.

Major Theory : Relational Data Base Management System.

Unit – I:

Introduction: Purpose of Database Systems – Data Models – Database Languages – Transaction Management – Storage Management – DBA – Database Users – System Structure. E – R Model – Entities and Entity sets – Relationship Sets – Mapping Constraints – E – R Diagram.

Unit – II:

Structure of Relational Databases – Relational Algebra – Tuple Relational Calculus – Domain Relational Calculus – Integrity Constraints – Normalization – Boyce – Codd Normal Form – Third Normal Form – Fourth Normal Form – Domain – Key Normal Form.

Unit – III:

Basic SQL Operations – Creating a table – Insert – Rollback – Commit – Auto commit – Delete – Update – Select, From, Where and Order by – single value tests – LIKE – simple tests against a list of values – Combining logic – Combining tables – Dropping tables – Dropping a column – Creating a table from a table – Data functions – Conversation functions – Translate – Decode – Creating a view – Advanced subqueries – Outer joins – Natural and Inner joins – Union, Intersect & Minus – Synonyms – Indexes – Tables spaces – Clusters – Sequences .

Unit – IV:

Basics of Object – Relational Databases: Objects – Abstract Data types – Nested tables – Varying arrays – Large Objects – References Object views – Naming conventions for objects – structure of an object.

Users, Roles and Privilege: Creating a user – Password management – Three Standard roles – Format for grant command – Revoking privileges – What users can Grant: Moving to another user – Create synonym – Create a role – Granting privileges to a role – Granting a role to another role – Adding Password to a role – Removing password from a role – Enabling & Disabling roles – Revoking privilege from a role – Drop role.

Unit – V:

An introduction to PL/ SQL: PL/SQL Overview – Declarations section – Executable commands section – Exception handling section – Triggers : Syntax – Types of Triggers : Row – Level – Statement – level – before & after – Instead of Schema – Database – Level Triggers – Enabling & Disabling triggers – Replacing & Dropping triggers – Procedures, Functions & Packages: Syntax – Compile – Replace – Drop Procedure , Functions & Packages – Cursor Management.

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan “*Database System Concepts*” McGraw – Hill Education, 2010
2. Kevin Loney, George Koch And the Experts at TUSC, “*ORACLE 9i The Complete Reference*”, Tata McGraw – Hill Publishing company Ltd., New Delhi,

Reference:

1. Rajesh Narang “*Database Management Systems*”, PHI Learning Pvt. Ltd., 2006.
2. Raghu Ramakrishnan, Johannes Gehrke, “*Database Management Systems*”, McGraw – Hill Education, 2002
3. Michael Abbay, Mike Corey, Ian Abramson, “*ORACLE 9i A Beginner’s Guide*”, Tata McGraw – Hill Publishing company Ltd., New Delhi, 2002.

Major Practical : Relational Data Base Management System – Lab List.

1. Create a simple table and write three queries to process a table.
2. Demonstrate query processing using aggregate operators.
3. Write oracle code for demonstrating the correlated sub queries.
4. Write oracle code to create employee records and delete the retired employees and store it on to another table with same structure.
5. Create a course table and create a procedure that displays the instructor details, class details and student details of a particular table which the user inputs.
6. Write a database trigger before insert for each row on the course table not allowing transactions on Sundays and Saturdays.
7. Create a package that contains overloaded functions for
 - i. Adding five integers
 - ii. Subtracting two integers.
 - iii. Multiplying three integers.
8. Write PL/SQL block to increase the salary by 10% if the salary is >2500 and < 3000.
9. Write PL/SQL block to display the names of those employee getting salary >3000. Create and insert records into the following tables. (Insert minimum 10 records in each table).
10. Create Student information table.
11. Create Department information table
12. Create Instructor's information table
13. Create Course information table
14. Create Schedule type details.
15. Create Student grade information table in PL/SQL.

Allied Theory : Operation Research and Numerical Analysis.

UNIT – I:

Transportation Problem: Introduction – General Transportation Problem – The Transportation Table – Formulation of the Transportation Problem – Triangular Basis in a Transportation Problem – Finding an initial basic feasible solution: North West corner rule – Least – Cost Method or Matrix Minima Method – Vogel's Approximation Method.

UNIT – II:

Assignment Problem: Introduction – Mathematical formulation of the problem – The Assignment method – The Travelling Salesman Problem.

UNIT – III:

Sequencing Problem: Introduction – Problem of Sequencing – Basic terms used in sequencing – Processing n jobs through two machines – Processing n jobs through k machines – Processing 2 jobs through k machines.

UNIT – IV:

Simultaneous equations – Back substitutions – Gauss Jordan elimination method – Calculation of inverse of a matrix – Gauss – Seidel iteration method.

UNIT – V:

Difference Operators – Newton’s interpolation formula – Lagrange’s interpolation formula – Divided difference interpolation – Inverse interpolation.

Text Books :

1. Kanti Swarup, P.K. Gupta and Man Mohan, “*Operations Research*”, Sultan Chand & Sons, New Delhi – Unit : I, II & III
2. S. Arumugam, A. Thangapandi Isaac and A. Somasundaram, “*Numerical Analysis*”, New Gamma Publishing House, Palayamkottai – Unit : IV & V

Reference :

1. T. Sankaranarayanan, Joseph A. Mangaladoss, “*Operations Research*”, Suja Publishing House, Tirunelveli
2. R. Panneerselvam, “*Operations Research*”, 2nd Edition, PHI Learning (2011), New Delhi.
3. Vasishtha, “*Numerical Analysis*”, Krishna Prakashan Media (P) Ltd. (2010), Meerut.

Major Theory : .Net Programming.

UNIT – I:

The .NET Frame Work – Learning the .NET languages – Introduction To ASP.NET and IIS – Types, Objects and Name Spaces – ASP.NET Application – Building ASP.NET Website.

UNIT – II:

Web Form Fundamentals – HTML controls – Web Controls – Validation Controls – Navigation Controls – Data Controls – Login Controls – CSS – Working with CSS in Web Developer – More Programs.

UNIT – III:

State Management – Session – View – Query String – Cookies – Tracing – Logging – Error Handling – User Controls – ASP.NET Ajax – Example Programs.

UNIT – IV:

ADO.NET – Over View of ADO.NET – ADO.NET Access – Data Binding – Data List – DATA Grid and Repeaters – Working with Database – Sample Programs.

UNIT – V:

XML – Using XML – XSD – XSLT – Web Services – Creating Web Services – Using Web Services – Caching – ASP.NET Security

Text Book :

1. Mathew Mac.Donald, “*ASP.NET The Complete Reference*”, Tata McGraw – Hill Publishing Company Ltd New Delhi .
2. Imar Spanjaars, “ASP.NET 3.5 in c# and V.B “, Wiley India Pvt Ltd.

Reference :

1. O'REILLY ,Jesse Liberty, Dan Hurwitz and Brian Mac Donald, "*Learning ASP.NET 3.5*", II Edition.

Major Practical: .Net Programming – Lab List

1. Arithmetic Operations Using Text Box and Button
2. Adding and Removing Items in runtime using Drop down list and List Box
3. Upload and display Image using File Up Load Control.
4. Display Date, Day, Month, Year, Day of Week, Day of the Year using Calendar Control.
5. Create an Advertisement using Ad rotator Control.
6. Create a Registration form and apply ASP.NET validation Controls.
7. Binding data in Grid View using source.
8. Create small pay roll
9. Create user control with Source.
10. Create a Login page using session variable
11. Create Student Mark list using SQL Provider.
12. Gridview Edit, Update, Cancel and Delete using source.
13. Create a Crystal Report
14. Create a Simple Web Page Using CSS
15. Create a Master Page.

Major Theory: Software Engineering.**Unit – I:**

Software Engineering: Definition – Software Engineering Activities, Skills and Challenges –Components of Software Engineering: SSAD and OOSAD – Software Life Cycle Model – Software Development Model – CMM for Process Improvement – Software Process Model – Software Estimation: Size Effort and Cost: Software Metrics: Introduction – Estimation of Effort and Schedule – COCOMO – Software Cost Estimation.

Unit – II:

Software Quality Assurance – Testing Technique for SQA – Software Testing Strategies – Software Engineering Tools – Introduction – Analysis Tools – Requirements Engineering – Work Breakdown Structure – Prototyping – System Analysis – System Modeling – Structured System Analysis – Software Requirement Specification.

Unit – III:

System Design: Introduction – Data Structure and Database Design – Design Development Process – System Design Architecture – Systems Behavior design – Architecture and Choices – Architecture and Non – functional Requirements – Design Specification Documentation – User Interface Design – User Interface Analysis and Design – Guidelines for Designing UI Components – Procedural Design.

Unit – IV:

Object Oriented Approach and Technology – Basis of Objects – Object Properties – Object Oriented System Development Cycle – UML – Static Class Diagrams – Use Case Diagrams – Behavior Diagrams.

Unit – V:

Software Project Management: Introduction – Basic Concepts – Project Management – Software Development Process Management – Management of Software Workflows – Evaluation of Workflow Process – Integration of Software Engineering Management and Project Life Cycle – Testing for Quality – Functional Testing – System Testing – User Satisfaction Testing – Test Cases and Test Plans – Software System Maintenance.

Text Book:

1. Waman S Jawadekar, “*Software Engineering Principles and Practice*”, Tata McGraw – Hill Education Private Limited, New Delhi.

Reference :

1. Roger S. Pressman, “*Software Engineering, A Practitioner’s Approach*”, McGraw – Hill Higher Education.
2. Timothy C. Lethbridge and Robert Laganier, “*Object – Oriented Software Engineering*”, Tata McGraw – Hill Publishing Company Limited, New Delhi.
3. Ian Sommerville, “*Software Engineering*”, Pearson Education Pte. Ltd., Delhi.

Major Theory: Operating System.**Unit – I:**

Operating system – What is an Operating System? – Computing System Architecture: Desktop Systems – Multiprocessor Systems – Distributed processing – Clustered Systems – Hand held systems – functions and Structure: Different services of the operating system – users of system calls – issue of portability – users view of the operating system – Graphical user interface – operating system structure – virtual machine – booting.

Unit – II:

Information Management: File System – Device Driver – Terminal I/O – CD – ROM. Process management: Introduction – what is process? Evolution of multiprogramming – Context switching – process states – process state transitions – process control block – process hierarchy – operation on a process – create a process – kill a process – dispatch a process – change the priority of a process – block a process – dispatch a process – time up a process – wake up a process – Suspend / resume operation – Process scheduling – Multithreading.

Unit – III:

Inter Process communication: the producer / Consumer problems – solutions to the producer consumer problems – Classical IPC Problems.

Deadlocks: Introduction – Graphical representation of deadlock – deadlock prerequisites – deadlock strategies.

Unit – IV:

Memory Management: Introduction – Single Contiguous memory management – fixed partition memory management – variable partitions – non contiguous allocation – paging – segmentation – combined system – virtual memory management system.

Unit – V:

Information Management: File System – Device Driver – Terminal I/O – CD – ROM.
Case Study: LINUX – Introduction – UNIX and LINUX: A Comparison – Process Management – Process Scheduling – Memory Management – File Management – Device Drivers – Security;

Text Book:

1. Operating Systems – Achyut S Godbole, *Tata McGraw – Hill Publishing Company, New Delhi, 2nd Edition, 2005.*

References:

1. Operating Systems, Internals and Design Principles, *William Stallings, PHI, 2008.*
2. Operating System Concepts – *Silberschatz and Galvin, 6th Edition, John Wiley & Sons, Inc., 2004*
3. An Introduction to Operating Systems – Concepts and Practice, *Pramod Chandra P.Bhatt, Prentice Hall Of India, 2007.*

Major Theory : Data Communications And Networking.**Unit – I:**

Data Communication: Standards Organizations – Line Configuration – Topology – Transmission Mode – Categories of Networks– Internet works – The Model – Functions of the Layers. Transmission of Digital Data: Interfaces and Modems – Digital Data Transmission – DTE – DCE Interface – Other Interface Standards.

Unit – II:

Transmission Media – Guided Media – Unguided Media – Multiplexing – Many to one / One to Many, Frequency – Division Multiplexing (FDM), Wave – Division Multiplexing (WDM), Time – Division Multiplexing (TDM).

Unit – III:

Error Detection and Correction: Types of Errors – Detection – Redundancy – Vertical Redundancy Check (VRC) – Longitudinal Redundancy Check (LRC) – Cycle Redundancy Check (CRC) – Checksum – Error Correction. Data Link Control – Line Discipline – Flow Control – Error Control.

Unit – IV:

Switching: Circuit Switching – Packet Switching – Message Switching – Integrated Services Digital Network (ISDN) – Services – History – Subscriber Access to The ISDN – The ISDN Layers – Broadband ISDN – Future of ISDN

Unit – V:

Frame Relay: Introduction – Frame Relay Operation – Frame Relay Layers – Congestion Control Leaky Bucket Algorithm – Traffic Control. Networking and Internetworking devices – Repeaters – Gateways – Other Devices – Routing Algorithms, Distance Vector Routing – Link State Routing.

Text Book:

1. Data Communications and Networking – “Behrouz A Forouzan.”, Tata McGraw Hill Publishing Company Limited, New Delhi. 2nd Edition 2006.

Reference Book:

1. Computer Networks – “Andrew S. Tanenbaum.” – Prentice Hall of India, 4th Edition, 2006
2. Data and Computer Communications “William Stallings Prentice Hall of India 2007

Major Theory : Multimedia Technology.

UNIT – I:

Introduction: Multimedia Presentation and Production – Characteristics of Multimedia. Presentation – Multiple Media – Utilities of Multi – sensory Perception – Hardware and Software. Requirements. Digital Representation: Analog Representation – Waves – Digital. Representation – Need for Digital Representation – Analog to Digital Conversion – Digital to Analog Conversion. Text: Types of Text – Unicode Standard – Font – Insertion of Text – Text compression – File formats.

UNIT – II:

Image: Image Types – Seeing Color – Color Models – Basic Steps for Image Processing – Scanner – Digital Camera – Interface Standards – Specification of Digital Images –

CMS – Device Independent Color Models – Image Processing software – File Formats – Image Output on Monitor and Printer.

UNIT – III:

Audio: Introduction – Acoustics – Nature of Sound Waves – Fundamental. Characteristics of Sound – Microphone – Amplifier – Loudspeaker – Audio Mixer – Digital Audio – Synthesizers – MIDI – Basics of Staff Notation – Sound Card – Audio Transmission – Audio File formats and CODECs – Audio Recording Systems – Audio and Multimedia – Voice Recognition and Response – Audio Processing Software.

UNIT – IV:

Video: Analog Video Camera – Transmission of Video Signals – Video Signal Formats – Television Broadcasting Standards – Digital Video – Digital Video Standards – PC Video – Video Recording Formats and Systems – Video File Formats and CODECs – Video Editing – Video Editing Software.

UNIT – V:

Animation: Types of Animation – Computer Assisted Animation – Creating Movement – Principles of Animation – Some Techniques of Animation – Animation on the Web – Special Effects – Rendering Algorithms. **Compression:** MPEG – 1 Audio – MPEG – 1 Video – MPEG – 2 Audio – MPEG – 2 Video.

Text Books:

1. Principles Of Multimedia – Ranjan Parekh, 2007, TMH.

Reference Books:

1. Multimedia: Making it Work – Tay Vaughan, 7th edition, TMH.
2. Comdex Multimedia And Web Design – Vikas Gupta, DreamTech press.2007.

Major Theory : Wireless Application Protocol.

Unit – I:

A Brief History of WAP: Origins – The WAP Forum – Forum Members – Why WAP?: The Great Convergence – WAP Device Characteristics – The Need For WAP – An Overview of WAP: WAP in Action – Web Transaction Model – WAP Transaction Model – WAP Architecture – A Closer Look at WAE.

Unit – II:

The WAP Application Environment: The Microbrowser – WML – WML Features – WMLScript – WAP Client Software, Hardware, and Web Sites: OEM Microbrowsers – Consumer Microbrowsers – WAP Devices – Consumer WAP Sites.

Unit – III:

WAP Gateways: A Note on Terminology – WAP Gateway Services – Security – WAP's Security – Some WAP Profiles: exo – net – MainFreight – Sky City Hotels – A Consumer Profile – What WAP Does Well – Implementing an Enterprise WAP Strategy – The Future of WAP: Problems with WAP – Solving These Problems – The Next Generation.

Unit – IV:

Document Status – References – Definitions and Abbreviations – WML and URLs – WML Character Set – WML Syntax – Core WML Data Types – Events and Navigation – The State Model.

Unit – V:

The Structure of WML Decks – User Agent Semantics – WML Reference Information – A Compact Binary Representation of WML – Static Conformance Statement.

Text Book:

1. Steve Mann, Scott Sbihli, *“The Wireless Application Protocol”*, Wiley India Pvt. Ltd., New Delhi.

Reference :

1. Dale Bulbrook, *“WAP: A Beginner’s Guide”*, Tata McGraw – Hill Publishing Company Limited, New Delhi.
2. Sandeep Singhal, Thomas Bridgman, Lalitha Suryanarayana, Daniel Mauney, Jari Alvinen, David Bevis, Jim Chan, Stefan Hild, *“WAP– The Wireless Application Protocol, Writing Applications for the Mobile Internet”*, Pearson Education Pte. Ltd., Delhi.

Major Theory : Web Programming.**UNIT – I:**

Introduction to Internet and World Wide Web – Components to Enable Internet Access – Features of Internet Explorer and Firefox – Browser Settings – Web 2.0 – Search Engines – Content Networks – User Generated Content – Blogging – Social Networking and Media – Tagging – RIA – Web Services, Mashups, Widgets and Gadgets – Location Based Services – Web 2.0 Models.

UNIT – II:

Introduction to XHTML – Structure of XHTML Document – Headings – Links – Images – Lists – Tables – Forms – Frames – Internal Linking – Web Page Design – Introduction to CSS – Inline Styles – Embedded Style Sheets – Conflicting Styles – Linking External Style Sheets – Positioning Elements – Backgrounds – Element Dimensions – Box Model and Text Flow – Media Types – Drop Down Menu – User Style Sheets – Sample Web Applications.

UNIT – III:

Introduction to JavaScript – Structure of JavaScript – Sample Programs – Memory Concepts – Operators – I/O Structures – Control Structures: Selection and Multiple Selection Structures – Repetition Structures – break and continue Structures – Functions: Programmer Defined Functions – Function Definition – Scope Rules – Global Functions – Recursion – Example Programs.

UNIT – IV:

Arrays: Declaring and Allocating Arrays – Passing Arrays to Functions – Multidimensional Arrays – Objects: Object Technology Concepts – Various JavaScript Objects – DOM Nodes and Trees – DOM Collections – Events and Event Models – XML Basics – XML Namespaces – DTD – XML Schema Documents – XML Vocabularies – XSL – RSS – ActiveX Controls – Sample Web Applications.

UNIT – V:

Server Side Programming – Web Servers: HTTP Transactions – IIS and Apache Servers – Databases: MySQL – ADO.NET Object Model – JDBC – PHP: PHP Basics – Form Processing – Dynamic Content – ASP.NET 2.0: Introduction – Developing Sample Web Application – Web Controls – Session Tracking – Case Studies.

Text Books:

1. Deitel, Deitel, “Internet & World Wide Web–How to Program”, 4 th Edition, Pearson Education, 2009.

Major Practical : Web Programming – Lab List.

- 1) Creating simple HTML page using CSS.
- 2) Develop a text formatting application using HTML and in line CSS.
- 3) Develop a JavaScript application using conditional statements.
- 4) Develop a JavaScript application using looping statements.
- 5) Develop a JavaScript array manipulation application.
- 6) Develop a HTML table formatting application.
- 7) Develop a JavaScript application to generate day of a date entered using switch statement.
- 8) Develop a sorting application for array of names using JavaScript.
- 9) Develop a JavaScript application to generate factorial of a number using recursive function.
- 10) Display a XML data in table format using CSS.
- 11) Display a XSL formatted XML application.
- 12) Develop a auto refreshing digital clock using JavaScript.
- 13) write a drop down list application using JavaScript.
- 14) Develop a JavaScript user login application which authenticate a user.
- 15) Develop a JavaScript application to display the visitors page count.

Major Practical : Software Developing.

Rules and Regulations:

1. Software developing is a Major part of course.
2. Software developing has Internal Examination of 40 marks and External 60 marks.
3. Each student should maintained a separate observation for the Software Development.
4. Students must develop a Software from the given topic.
5. The software must be developed with in the college computer lab, Other S/W is not allowed for execution during the University Examination.
6. Students can choose any S/W language studied under this course.
7. After developing a S/W students must submit a report.
8. Staff Incharge (guide) have the right to choose a topic from the given list with the consultants of students.
9. A class is divided into several batches; Batch can have a maximum of 5 students.
10. A topic can have any number of modules; Modules should given to each batch.
11. The topic is given below.

Software Developing Topic.

1. College Administration System.
2. Hospital Administration System.
3. E_Ticket Booking System.
4. Online shopping.
5. Online Examinations
6. Human resource management System.
7. Travel Management System.
8. Transport Management System.
9. Budget maintaining system.
10. Online Voting System.

Group A (Major Elective – I)

Major Elective Theory : Management Information Systems.

Unit – I:

Definition of MIS – Systems approach – meaning and objectives of MIS – MIS and use of computer – limitations of MIS.

Unit – II:

Computer Software for information systems – introduction – system software – Application software – Software Trends.

Unit – III:

Information system in Business – introduction – Functional areas of Business – marketing information system – Human Resource Information system

Unit – IV :

Application of Information Technology in Business – Introduction of E – Commerce, Mobile Commerce, E – Governance, E – enterprises, From PC to the Web.

Unit – V:

Information security, Ethics and Society – Challenges of Securing computer systems – Types of Security Breaches, Cyber Laws and IT Act 2000 – Ethical and social Dimensions of Information Technology

Text Books:

1. Management, Information system A.K. Gupta – S. Chand and Company
2. Management Information system Dr. S.P. Rajagopalan – Margham Publications

Reference:

1. Management Information system P. Mohan – Himalaya Publishing House
2. Management Information System, Managerial perspectives – D.P. Goyal – Macmillan

Major Elective Theory : E-Commerce

Unit – I:

Introduction to E – Commerce – Networks – Transactions – Commercial Transactions – Why use E – Commerce – Internet and other Novelties – Advantages of E – Commerce – Electronic Transactions Today – World Wide Web

Unit – II:

Security Technologies – Why Internet Is Unsecure – Internet Security Holes – Cryptography: Objectives – Codes and Ciphers – Breaking Encryption Schemes – DES – Cryptographic Applications – Digital Signature – Nonrepudiation and Message Integrity

Unit – III:

Traditional Transactions : Updating – Offline and Online Transaction – Secure Web Servers – Required Facilities – Digital Currencies and Payment Schemes – Protocol for the Public Transport – Security Protocols – Credit Card Business Basics.

Unit – IV:

Online Commerce Options – Functions and Features – Payment Systems: Electronic, Digital and Virtual Internet Payment Systems – Account Setup and Costs – Virtual Transaction Process – InfoHaus – Security Considerations.

Unit – V:

CyperCash: Model – Security – Customer Protection – Client Applicationp – Selling through CyperCash – Servers and Commercial Environments – Payment Methods – Server Market Orientation – Netscape Commerce Server – Microsoft Internet – Servers – Smart Cards.

Text Book:

1. Pete Loshin, “Electronic Commerce”, 4th edition, An imprint ofd laxmi publications pvt .ltd, New Delhi 2004.

Reference Books

1. Jeffrey F. Rayport and Bernard J. Jaworski , “Introduction To E – Commerce”, 2nd ed, Tata Mc – Graww Hill pvt Ltd, 2003
2. Greenstein, “ E – Commerce”, Tata Mc – Graww Hill pvt Ltd, 2000.

Major Elective Theory : Enterprise Resource Planning.**UNIT – I:**

Business function and Business process: Functional areas and Business Process – functional area of operations – Business process – Marketing Sales – supply chain management – Accounting and finance – Human Resource – Functional areas of information system – The development of ERP system SAP R/3 – New directions in ERP – significance and benefits of ERP software and systems.

UNIT – II:

Marketing information system and sales order process in ERP: sales and Distribution in ERP – Pre sales activities – sales order processing – inventory Sourcing – Delivery – Billing – payment – Customer relationship Management – benefits of CRM.

UNIT – III:

Production and supply chain management information system: Production overview – The production planning process – The SAP ERP Approach to production planning – Sales forecasting – sales and operation Planning – Demand management – Material requirement planning in SAP ERP – ERP and supplier – supply chain.

UNIT – IV:

Accounting in ERP : Accounting activities – using ERP for accounting Information – operational decision making problem – credit management –Industrial credit management in SAP ERP – product profitability analysis – Management reporting with ERP system – Document flow for customer Service.

UNIT – V:

Human resource process in ERP: HR with ERP – Advance HR features – Time management – Payroll – Travel management – Training and Development – Management by objectives – ERP process modeling

Text Book:

1. Enterprise Resource Planning – Ellen Monk And Bret Wagner – 3rd edition – MGH.

Group B (Major Elective – II)**Major Elective Theory : Artificial Intelligence.****Unit – I:**

What is Artificial Intelligence? – The AI Problems – What is an AI Technique? – Tic – Tac – Toe – Defining the Problem as a State Space Search – A Water Jug Problem – Control Strategies – Breadth – First Search – Depth – First Search – Heuristic Search – Problem Characteristics.

Unit – II:

Generate – and – Test – Hill Climbing – Best – First Search – The A* Algorithm – Problem Reduction – AND – OR Graphs – The AO* Algorithm – Means – Ends Analysis.

Unit – III:

Knowledge Representation Issues: Representations and Mappings – Approaches to Knowledge Representation – Using Predicate Logic – Representing Simple Facts in Logic – Representing Instance and Isa Relationships – Computable Functions and Predicates.

Unit – IV:

Game Playing: The Minimax Search Procedure – Adding Alpha – Beta Cutoffs – Planning: An Example Domain: The Blocks World – Components of a Planning System – Goal Stack Planning – Understanding: What is Understanding? – What Makes Understanding Hard?

Unit – V:

Expert Systems: Representing and Using Domain Knowledge – Expert System Shells – Explanation – Knowledge Acquisition – Perception and Action: Real – Time Search – Perception – Action – Robot Architectures.

Text Book:

1. Elaine Rich, Kevin Knight, “*Artificial Intelligence*”, Tata McGraw – Hill Publishing Company Limited, New Delhi.

Reference:

1. Stuart Russell, Peter Norving, “*Artificial Intelligence, A Modern Approach*”, PHI Learning Private Limited
2. Dan W. Patterson “*Introduction to Artificial Intelligence And Expert Systems*”, PHI Learning Private Limited

Major Elective Theory : Systems Programming.**Unit – I:**

Evolution of the Components of a Programming System – Assemblers – Loaders – Macros – Compilers – Formal Systems. MACHINE STRUCTURE, MACHINE LANGUAGE, AND ASSEMBLY LANGUAGE : General Machine Structure – Machine Language – An Assembly Language.

Unit – II:

ASSEMBLERS: General Design Procedure – Design of Assembler –Table Processing: Searching and Sorting –Linear search – Binary search – Sorting – Interchange sort – shell sort – Bucket sort – Radix Exchange sort – address calculation sort – Comparison of sorts – hash or random entry searching.

Unit –III:

MACRO LANGUAGE AND THE MACRO PROCESSOR : Macro Instructions – Features of a Macro facility – Macro Instructions Arguments – Conditional Macro Expansion – Macro calls within Macros – Macro Instructions Defining Macros – Implementation – Implementation of a Restricted Facility: A two Pass Algorithm – A single –Pass Algorithm – Implementation of Macro Calls within Macros –Implementation within a Assembler.

Unit –IV:

LOADERS : Loader schemes – Compile and –go – Loaders – General Loader scheme – Absolute loaders – Subroutine Linkages – Relocating Loaders – Direct – Linking Loaders – Other Loader Schemes – Binders, Linking Loaders, Overlays, Dynamic Binders – Design of an Absolute Loader – Design of a Direct – Linking Loader – Specification of problem – Specification of Data Structure – format of data bases – Algorithm.

COMPILERS : PART 1

Statement of Problem – Recognizing Basic Elements – Recognizing Syntactic Units and Interpreting meaning – Intermediate Form – Storage Allocation – Code generation – Optimization(Machine – independent) – Optimization(Machine – dependent) – Assembly Phase – General Model of Compiler

Unit – V:

PART 2: Phases of the Compiler – Lexical Phase – Syntax phase – Interpretation Phase – Optimization – Storage assignment – Code Generation – Assembly Phase – Phase of a Compiler.

PART – 3 – Data structures – Recursion, call, and return Statements – Storage Classes – use – Implementation – Block structure – Nonlocal go to’s – Interrupts – Pointers.

Text Book:

1. “Systems Programming”, John J. Donovan, McGraw – Hill International Editions.

Major Elective Theory : Embedded Systems.

Unit – I:

Introduction: Embedded Systems and general purpose computer systems, history, classifications, applications and purpose of embedded systems Core of embedded systems: microprocessors and microcontrollers, RISC and CISC controllers, Big endian and Little endian processors, Application specific ICs, Programmable logic devices, COTS, sensors and actuators, communication interface, embedded firmware, other system components, PCB and passive components.

Unit – II:

Characteristics and quality attributes of embedded systems: characteristics, operational and non – operational quality attributes, application specific embedded system – washing machine, domain specific – automotive.

Unit – III:

Programming embedded systems: structure of embedded program, infinite loop, compiling, linking and locating, downloading and debugging

Unit – IV:

Embedded Hardware: Memory map, i/o map, interrupt map, processor family, external peripherals, memory – RAM , ROM, types of RAM and ROM, memory testing, CRC, Flash memory.

Peripherals: Control and Status Registers, Device Driver, Timer Driver – Watchdog Timers, Embedded Operating System, Real – Time Characteristics, Selection Process

Unit – V:

Design and Development: embedded system development environment – IDE, types of file generated on cross compilation, disassembler / decompile, simulator, emulator and debugging, embedded product development life – cycle, trends in embedded industry.

Text Books:

1. Programming Embedded Systems in C and C++, First Edition January, Michael Barr, O'Reilly
2. Introduction to embedded systems, Shibu K V, TATAMCGRAW – HILL.

References:

1. Embedded Systems, Rajkamal, TMH.
2. The 8051 Microcontroller and Embedded Systems Using Assembly and C, Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay, Pearson Education.

Skilled Based Subject Syllabus

Semester III

Skilled based subjects are practical oriented. One hour should be assigned for tutorial class and three hours of practical to do the given practical list.

Sample should be provided to the students for designing the given list.

Subject : DTP

Page Maker

1. Design of ID card (3''*2'')
2. Design visiting card(3.5''*2'').
3. Design of an attractive invitation card(5.5''*8'')
4. Design letter pad(7.5''*9'').
5. Preparation of a small booklet with 6 pages(3.5''*4.5'').
6. Design a hand bill(5.5''*8.5'')
7. Create a advertisement for your college.
8. Design your college progress card.
9. Create a receipt bill with counter foil.
10. Create a graph/pie chart.

Photoshop

1. Design of a brochure for an institution.
2. Seasonal greeting card.
3. Transporting an image from one background to another.
4. Design a web page poster(1004*750)/textbook cover page.
5. Crop an image/rotate an image.

CoreIDRAW

1. Create an object and fill with multiple colours.
2. Design a book cover.
3. Create a frame and enter a paragraph with different formats of text.
4. Export any five image in a single applications.
5. Design page frame by inserting image and objects.

Skilled Based Subject Syllabus

Semester V

Skilled based subjects are practical oriented. One hour should be assigned for tutorial class and three hours of practical to do the given practical list.

Sample should be provided to the students for designing the given list.

Subject : Animation Applications.

FLASH

1. Create a simple Presentation.
2. End a movie clip using Script.
3. Start a graphic animation at a specific frame.
4. Text animation using motion tweening.
5. Activate a new window/page using buttons.
6. Bouncing ball with sound effect.
7. Create a scrolling gallery in a page.

DREAMWEAVER

1. Creating a New Dreamweaver Site
2. Adding Images, Text and Links
3. Flash Buttons and Flash Text
4. Create a Rollover Images
5. Creating Tables – FAQs
6. Designing Web Pages with Frames
7. Inserting and Formatting a Table in Standard View
8. Design navigation Bar with Images

NON – MAJOR ELECTIVE PAPERS – I :

Other than B.Sc (IT), B.Sc(CIT) &B.Sc (ISM).

INTRODUCTION TO INFORMATION TECHNOLOGY.

Unit – I:

Information Technology Basics: Introduction , Information, Technology, Information technology, Present Scenario, Role of Information Technology, Information technology and internet, Careers in IT industry. Computer organization and Architecture: Central Processing Unit, Inside a computer, Data representation in Computer, Coding Schemes.

Unit – II:

Computer Memory and Storage Introduction, memory hierarchy, Random Access Memory (RAM) , Read only memory (ROM), RAM, ROM and CPU Interaction, Types of Secondary storage devices, Magnetic tape, magnetic disk, types of magnetic disk, optical disk, type of optical disks.

Unit – III:

Input Output Media: Introduction, types of input devices, types of output devices. Multimedia Essentials: Introduction, Multimedia: Definition, Building blocks of multimedia, multimedia system, multimedia applications, Virtual reality.

Unit – IV:

The Internet : Introduction, Evolution of Internet – Basic Internet terms – Getting connected to Internet – Internet Applications – Data over Internet. Internet tools: Introduction – Web Browser – Browsing Internet using Internet Explorer – E – Mail – Search engines – Instant messaging.

Unit – V:

Emerging trends in IT: Introduction, E – Commerce –Electronic Data Interchange – Mobile Communication – Bluetooth – Global Positioning System – Infrared Communication – Smart Card – Imminent Technologies.

Text Book:

Introduction to Computers and Information Technology, D. Glory Ratna Mary, S. Selvanayahi, V. Joseph Peter, Shekina Publications.

Reference Books:

3. Introduction to Information Technology ITL Education Solutions Limited, Pearson Education.
4. Fundamentals of Information Technology By Alexis Leon & Mathews Leon Vikas publication – New Delhi.

NON – MAJOR ELECTIVE PAPERS – II .

Other than B.Sc (IT), B.Sc(CIT) &B.Sc (ISM).

BASIC PROGRAMMING DESIGN**Unit – I :**

Introduction – Algorithms, Flowcharts, Types of Programming languages, Selection of Programming languages, Program writing Debugging.

Unit – II :

Flow Charts – Elementary Concepts. – Introduction, Kinds of flow charts, symbols used in flow charts, Advantages of flow charts, examples, constants and variables.

Unit – III :

Flow Charting Simple Computations. – Introduction, illustrating examples, conclusions.

Unit – IV :

Subscripted Variables – Introduction, basic concepts of subscripted variables, one dimensional array, illustrating examples, conclusions.

Unit – V :

Multidimensional Arrays. – Introductions, definitions, matrix operations, illustrating examples, beyond two dimensions, conclusions. – Introduction To File Structure.

Introduction, Concept of data files, Types of data files, File Organization methods, File processing activities, Conclusions.

Text Book:

1. Basic Programming Design. D.S. Arul Selvan & A. A. Regieson Sylum Shalom Publications, Green St, Nagercoil.

Reference:

1. Insight into Flowcharting. Raj K. Jain. By S. Chand & Company ltd.

APPENDIX - AZ51

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI -12

B.Sc. Degree Course in Computer and Information Technology (CBCS).

Full-Time - 6 Semesters

Syllabus for III & VI Semester.

With Effect From academic year (2012-2013).

Title Of The Subject		Teaching Hours.	Credits
III SEMESTER			
Part III Core	Major - III Management Information System	6	4
	Major - IV Advanced Java Programming	6	4
	Major Practical- III Advanced Java Programming Lab	6	4
Part IV	Skill Based Subject – I (DTP)	4(1T & 3P)	4
	Non - Major Elective - I	2	2
	Allied Subject - II Theory - Data Structure	4	2
	Allied Practical - Data Structure	2	2
	Total	30	22
IV SEMESTER			
Part III Core	Major - V Relational Database Management System	6	4
	Major Practical - IV Relational Database Management System Lab	6	4
Part IV	Common Skill Based Subject	4	4
	Non - Major Elective - II	6	2
	Major Elective - I (Group - A)	6	5
	Allied Subject - II Operations Research & Numerical Analysis	4	4
	Allied Practical - Data Structure	2	2
Part V	Extension Activity		1
	Total	30	26

V SEMESTER			
Part III Core	Major - VI .Net Programming	4	4
	Major - VII Software Engineering	4	4
	Major - VIII Operating System	4	4
	Major Practical - V .Net Programming Lab	8	4
	Major Elective - II (Group - B)	6	5
Part IV	Skill Based Subject – II (Animation Applications)	4(1T & 3P)	4
	Total	30	25
VI SEMESTER			
Part III Core	Major - IX Data Communications And Networking	4	4
	Major - X Multimedia Technology	4	4
	Major - XI Artificial Intelligence	4	4
	Major - XII Web Programming	4	4
	Major Practical - VI Web Programming Lab	8	4
	Major Practical- VII Software Developing	6	5
	Total	30	25

Major Elective	
Major Elective - I (Group - A)	E-Commerce.
	Data Mining & Warehousing.
	Internet Security.
Major Elective - II (Group - B)	Open Source Software.
	System Programming.
	Parallel Computing

Major Theory : Management Information Systems.

Unit – I:

Definition of MIS – Systems approach – meaning and objectives of MIS – MIS and use of computer – limitations of MIS.

Unit – II:

Computer Software for information systems – introduction – system software – Application software – Software Trends.

Unit – III:

Information system in Business – introduction – Functional areas of Business – marketing information system – Human Resource Information system

Unit – IV :

Application of Information Technology in Business – Introduction of E – Commerce, Mobile Commerce, E – Governance, E – enterprises, From PC to the Web.

Unit – V:

Information security, Ethics and Society – Challenges of Securing computer systems – Types of Security Breaches, Cyber Laws and IT Act 2000 – Ethical and social Dimensions of Information Technology

Text Books:

1. Management, Information system A.K. Gupta – S. Chand and Company
2. Management Information system Dr. S.P. Rajagopalan – Margham Publications

Reference:

1. Management Information system P. Mohan – Himalaya Publishing House
2. Management Information System, Managerial perspectives – D.P. Goyal – Macmillan

Major Theory : Advanced Java Programming.

UNIT – I:

The Genesis of Java – Overview of Java – Development of Java – JDE – Data Types – Variables – Arrays – Type Conversion and Casting – Operators –Precedence – Control Statements.

UNIT – II:

Introducing Classes – Objects – OOP,s Concepts – Declaring Objects – Introducing Methods – Constructors – Overloading – this keyword – Garbage collection – finalize() method – More Examples.

Objects as parameter – returning objects – recursion – Access Control – static – final – Nested and Inner classes – Command line arguments – Sample Programs.

UNIT – III:

String and String Buffer Class Inheritance – Types of Inheritance – Method Overriding – Dynamic method Dispatch – Abstract Class – Final with Inheritance – More Examples.

Packages – Access Protection – Importing Packages – Interfaces – Implement and Applying Interfaces – Sample Programs.

UNIT – IV:

Exception Handling – Exception Types – Our Own Exception – Handling Exception – Java’s Built in Exception – Thread Class and Runnable Interface – Extending Thread – Creating Multiple Threads – isAlive() and join() methods – Synchronization – suspend(),resume() and stop() threads – Example Programs

I/O packages – Input Stream – Output Stream – File Input and Output Stream – Applet Class – An Applet Skeleton – Simple Applet Display Methods – Example Programs

UNIT – V:

Event Handling – Delegation Event Model – Event classes – Sources of Events – Event Listener Interface – AWT controls – Labels – Buttons – Check Boxes – Check Box Group – Lists – Scroll Bar – Text Area – Menu Bars and Menu – Lay out Managers – Examples

Text Book :

1. Herbert Schildt, “*Java 2*”, Fourth Edition, Tata McGraw – Hill Publishing Company Ltd New Delhi .

Reference :

1. Peter Norton and William Stanek, “*Guide To Java Programming*”, Techmedia,New Delhi
2. Martin Rinehart, ”Java Database Development”,ed – 1998, Tata McGraw – Hill Publishing Company Ltd New Delhi .

Major Practical : Advanced Java Programming – Lab list.

1. Create a Simple program with your own detail.
2. Use Overload(i) Method (ii) Constructor
3. Create a Program for object as parameters and returning objects.
4. Create a program with abstract class.
5. Create a program Using Multilevel Inheritance.
6. Develop a Program using Interface
7. Create and Import package(Minimum Three classes)
8. Create Our Own Exception for Employees.(Constraints 1.Age>18 and<58) 2. Dept No 10||20||30||40)
9. Suspend, Resume and Stop Threads(Minimum 3 Threads)
10. Read and write the content of a file using I/O package
11. Display a Simple Banner Applet
12. Event Handling Mechanism for Key board and Mouse
13. Create a Login form.
14. Simple Web Presentation using HTML tag(Use 3 Pages)
15. Create a Program for Movig Ball(Start and Stop)
16. Create a simple Java database with 4 fields.

Allied Theory : Data Structures.

Unit – I:

Introduction and Overview – Definitions – Concept of Data Structures – Overview of Data Structures – Implementation of Data Structures. Arrays – One – dimensional Array – Memory allocation of an Array – Operation on Arrays – Application of Arrays – Multidimensional Arrays – Two – dimensional Array – Sparse Matrices – Three – dimensional and n – dimensional Arrays – Pointer Arrays.

Unit – II :

Linked Lists – Definition – Single Linked List – Representation of a Linked List in memory – Operations on a Single Linked List – Circular Linked List – Double Linked List – Operations on a Double Linked List – Circular Double Linked List – Operations on Circular Double Linked List – Applications of Linked List – Sparse Matrix Manipulation – Polynomial Representation – Dynamic Storage Management – Memory Representation – Fixed Block Storage – Variable Block Storage.

Unit – III:

Stacks – Definition – Representation of a Stack – Array Representation of Stacks – Linked List Representation of Stacks – Operation on Stacks – Application of Stacks – Evolution of Arithmetic Expressions – Implementation of Recursion – Factorial Calculation – Quick Sort.

Queues – Definition – Representation of Queues – Representation of Queues using an Array – Representation of a Queue using a Linked List – Various Queue Structures – Circular Queue – Deque – Priority Queue.

Unit – IV

Tables – Hash Tables – Hashing Techniques – Collision Resolution Techniques – Closed Hashing – Open Hashing – Comparison of Collision Resolution Techniques.

Representation of Binary Tree – Linear Representation of Binary Tree – Linked Representation of Binary Tree – Physical Implementation of a Binary Tree in Memory – Operation on a Binary Tree – Insertion – Deletion – Traversals – Merging together Two Binary Trees – Types of Binary Trees – Expression Tree – Binary Search Tree – Heap Tree – Threaded Binary Tree.

Unit – V:

Sorting – Sorting Techniques – Straight Insertion sort – Straight Selection Sort – Heap Sort – Bubble Sort – Shell Sort – Quick Sort – Merge sort. Searching – Linear Search Techniques – Linear Search with Array – Linear search with Linked List – Linear search with Ordered List – Binary Search.

Text Book:

1. “Classic Data Structures” Debasis Samanta, PHI Learning Private Limited, New Delhi, 2009 Second Edition.

Allied Practical : Data Structures – Lab List.

1. Search an element in an array using Binary Search.
2. Stack implementation using array
3. Queue implementation using array
4. To manipulate a linked list
5. Infix to postfix conversion.
6. Evaluation of Postfix expression.
7. Tree traversal.
8. Merge sort
9. Selection sort
10. Quick sort.

Major Theory : Relational Data Base Management System.

Unit – I:

Introduction: Purpose of Database Systems – Data Models – Database Languages – Transaction Management – Storage Management – DBA – Database Users – System Structure. E – R Model – Entities and Entity sets – Relationship Sets – Mapping Constraints – E – R Diagram.

Unit – II:

Structure of Relational Databases – Relational Algebra – Tuple Relational Calculus – Domain Relational Calculus – Integrity Constraints – Normalization – Boyce – Codd Normal Form – Third Normal Form – Fourth Normal Form – Domain – Key Normal Form.

Unit – III:

Basic SQL Operations – Creating a table – Insert – Rollback – Commit – Auto commit – Delete – Update – Select, From, Where and Order by – single value tests – LIKE – simple tests against a list of values – Combining logic – Combining tables – Dropping tables – Dropping a column – Creating a table from a table – Data functions – Conversation functions – Translate – Decode – Creating a view – Advanced subqueries – Outer joins – Natural and Inner joins – Union, Intersect & Minus – Synonyms – Indexes – Tables spaces – Clusters – Sequences .

Unit – IV:

Basics of Object – Relational Databases: Objects – Abstract Data types – Nested tables – Varying arrays – Large Objects – References Object views – Naming conventions for objects – structure of an object. – Users, Roles and Privilege: Creating a user – Password management – Three Standard roles – Format for grant command – Revoking privileges – What users can Grant: Moving to another user – Create synonym – Create a role – Granting privileges to a role – Granting a role to another role – Adding Password to a role – Removing password from a role – Enabling & Disabling roles – Revoking privilege from a role – Drop role.

Unit – V:

An introduction to PL/ SQL: PL/SQL Overview – Declarations section – Executable commands section – Exception handling section – Triggers : Syntax – Types of Triggers : Row – Level – Statement – level – before &after – Instead of Schema – Database – Level Triggers – Enabling & Disabling triggers – Replacing & Dropping triggers – Procedures, Functions & Packages: Syntax – Compile – Replace – Drop Procedure , Functions & Packages – Cursor Management.

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan “*Database System Concepts*” McGraw – Hill Education, 2010
2. Kevin Loney, George Koch And the Experts at TUSC, “*ORACLE 9i The Complete Reference*”, Tata McGraw – Hill Publishing company Ltd., New Delhi,

Reference:

1. Rajesh Narang_ “*Database Management Systems*”, PHI Learning Pvt. Ltd., 2006.
2. Raghu Ramakrishnan, Johannes Gehrke, “*Database Management Systems*”, McGraw – Hill Education, 2002
3. Michael Abbay, Mike Corey, Ian Abramson, “*ORACLE 9i A Beginner’s Guide*”, Tata McGraw – Hill Publishing company Ltd., New Delhi, 2002.

Major Practical : Relational Data Base Management System – Lab List.

1. Create a simple table and write three queries to process a table.
2. Demonstrate query processing using aggregate operators.
3. Write oracle code for demonstrating the correlated sub queries.
4. Write oracle code to create employee records and delete the retired employees and store it on to another table with same structure.
5. Create a course table and create a procedure that displays the instructor details, class details and student details of a particular table which the user inputs.
6. Write a database trigger before insert for each row on the course table not allowing transactions on Sundays and Saturdays.
7. Create a package that contains overloaded functions for
 - i. Adding five integers
 - ii. Subtracting two integers.
 - iii. Multiplying three integers.
8. Write PL/SQL block to increase the salary by 10% if the salary is >2500 and < 3000.
9. Write PL/SQL block to display the names of those employee getting salary >3000. Create and insert records into the following tables. (Insert minimum 10 records in each table).
10. Create Student information table.
11. Create Department information table
12. Create Instructor's information table
13. Create Course information table
14. Create Schedule type details.
15. Create Student grade information table in PL/SQL.

Allied Theory : Operation Research and Numerical Analysis.

UNIT – I:

Transportation Problem: Introduction – General Transportation Problem – The Transportation Table – Formulation of the Transportation Problem – Triangular Basis in a Transportation Problem – Finding an initial basic feasible solution: North West corner rule – Least – Cost Method or Matrix Minima Method – Vogel's Approximation Method.

UNIT – II:

Assignment Problem: Introduction – Mathematical formulation of the problem – The Assignment method – The Travelling Salesman Problem.

UNIT – III:

Sequencing Problem: Introduction – Problem of Sequencing – Basic terms used in sequencing – Processing n jobs through two machines – Processing n jobs through k machines – Processing 2 jobs through k machines.

UNIT – IV:

Simultaneous equations – Back substitutions – Gauss Jordan elimination method – Calculation of inverse of a matrix – Gauss – Seidel iteration method.

UNIT – V:

Difference Operators – Newton's interpolation formula – Lagrange's interpolation formula – Divided difference interpolation – Inverse interpolation.

Text Books :

1. Kanti Swarup, P.K. Gupta and Man Mohan, “*Operations Research*”, Sultan Chand & Sons, New Delhi – Unit : I, II & III
2. S. Arumugam, A. Thangapandi Isaac and A. Somasundaram, “*Numerical Analysis*”, New Gamma Publishing House, Palayamkottai – Unit : IV & V

Reference :

1. T. Sankaranarayanan, Joseph A. Mangaladoss, “*Operations Research*”, Suja Publishing House, Tirunelveli
2. R. Panneerselvam, “*Operations Research*”, 2nd Edition, PHI Learning (2011), New Delhi.
3. Vasishtha, “*Numerical Analysis*”, Krishna Prakashan Media (P) Ltd. (2010), Meerut.

Major Theory : .Net Programming.**UNIT – I:**

The .NET Frame Work – Learning the .NET languages – Introduction To ASP.NET and IIS – Types, Objects and Name Spaces – ASP.NET Application – Building ASP.NET Website.

UNIT – II:

Web Form Fundamentals – HTML controls – Web Controls – Validation Controls – Navigation Controls – Data Controls – Login Controls – CSS – Working with CSS in Web Developer – More Programs.

UNIT – III:

State Management – Session – View – Query String – Cookies – Tracing – Logging – Error Handling – User Controls – ASP.NET Ajax – Example Programs.

UNIT – IV:

ADO.NET – Over View of ADO.NET – ADO.NET Access – Data Binding – Data List – DATA Grid and Repeaters – Working with Database – Sample Programs.

UNIT – V:

XML – Using XML – XSD – XSLT – Web Services – Creating Web Services – Using Web Services – Caching – ASP.NET Security

Text Book :

1. Mathew Mac.Donald, “*ASP.NET The Complete Reference*”, Tata McGraw – Hill Publishing Company Ltd New Delhi .
2. Imar Spanjaars, “*ASP.NET 3.5 in c# and V.B* “, Wiley India Pvt Ltd.

Reference :

1. O'REILLY ,Jesse Liberty, Dan Hurwitz and Brian Mac Donald, “*Learning ASP.NET 3.5*”, II Edition.

Major Practical: .Net Programming – Lab List

1. Arithmetic Operations Using Text Box and Button
2. Adding and Removing Items in runtime using Drop down list and List Box
3. Upload and display Image using File Up Load Control.
4. Display Date, Day, Month, Year, Day of Week, Day of the Year using Calendar Control.

5. Create an Advertisement using Ad rotator Control.
6. Create a Registration form and apply ASP.NET validation Controls.
7. Binding data in Grid View using source.
8. Create small pay roll
9. Create user control with Source.
10. Create a Login page using session variable
11. Create Student Mark list using SQL Provider.
12. Gridview Edit, Update, Cancel and Delete using source.
13. Create a Crystal Report
14. Create a Simple Web Page Using CSS
15. Create a Master Page.

Major Theory: Software Engineering.

Unit – I:

Software Engineering: Definition – Software Engineering Activities, Skills and Challenges – Components of Software Engineering: SSAD and OOSAD – Software Life Cycle Model – Software Development Model – CMM for Process Improvement – Software Process Model – Software Estimation: Size Effort and Cost: Software Metrics: Introduction – Estimation of Effort and Schedule – COCOMO – Software Cost Estimation.

Unit – II:

Software Quality Assurance – Testing Technique for SQA – Software Testing Strategies – Software Engineering Tools – Introduction – Analysis Tools – Requirements Engineering – Work Breakdown Structure – Prototyping – System Analysis – System Modeling – Structured System Analysis – Software Requirement Specification.

Unit – III:

System Design: Introduction – Data Structure and Database Design – Design Development Process – System Design Architecture – Systems Behavior design – Architecture and Choices – Architecture and Non – functional Requirements – Design Specification Documentation – User Interface Design – User Interface Analysis and Design – Guidelines for Designing UI Components – Procedural Design.

Unit – IV:

Object Oriented Approach and Technology – Basis of Objects – Object Properties – Object Oriented System Development Cycle – UML – Static Class Diagrams – Use Case Diagrams – Behavior Diagrams.

Unit – V:

Software Project Management: Introduction – Basic Concepts – Project Management – Software Development Process Management – Management of Software Workflows – Evaluation of Workflow Process – Integration of Software Engineering Management and Project Life Cycle – Testing for Quality – Functional Testing – System Testing – User Satisfaction Testing – Test Cases and Test Plans – Software System Maintenance.

Text Book:

1. Waman S Jawadekar, “*Software Engineering Principles and Practice*”, Tata McGraw – Hill Education Private Limited, New Delhi.

Reference :

1. Roger S. Pressman, “*Software Engineering, A Practitioner’s Approach*”, McGraw – Hill Higher Education.
2. Timothy C. Lethbridge and Robert Laganieri, “*Object – Oriented Software Engineering*”, Tata McGraw – Hill Publishing Company Limited, New Delhi.
3. Ian Sommerville, “*Software Engineering*”, Pearson Education Pte. Ltd., Delhi.

Major Theory : Operating System.**Unit – I:**

Operating system – What is an Operating System? – Computing System Architecture: Desktop Systems – Multiprocessor Systems – Distributed processing – Clustered Systems – Hand held systems – functions and Structure: Different services of the operating system – users of system calls – issue of portability – users view of the operating system – Graphical user interface – operating system structure – virtual machine – booting.

Unit – II:

Information Management: File System – Device Driver – Terminal I/O – CD – ROM. Process management: Introduction – what is process? Evolution of multiprogramming – Context switching – process states – process state transitions – process control block – process hierarchy – operation on a process – create a process – kill a process – dispatch a process – change the priority of a process – block a process – dispatch a process – time up a process – wake up a process – Suspend / resume operation – Process scheduling – Multithreading.

Unit – III:

Inter Process communication: the producer / Consumer problems – solutions to the producer consumer problems – Classical IPC Problems.

Deadlocks: Introduction – Graphical representation of deadlock – deadlock prerequisites – deadlock strategies.

Unit – IV:

Memory Management: Introduction – Single Contiguous memory management – fixed partition memory management – variable partitions – non contiguous allocation – paging – segmentation – combined system – virtual memory management system.

Unit – V:

Information Management: File System – Device Driver – Terminal I/O – CD – ROM. Case Study: LINUX – Introduction – UNIX and LINUX: A Comparison – Process Management – Process Scheduling – Memory Management – File Management – Device Drivers – Security;

Text Book:

1. Operating Systems – Achyut S Godbole, *Tata McGraw – Hill Publishing Company, New Delhi, 2nd Edition, 2005.*

References:

1. Operating Systems, Internals and Design Principles, *William Stallings, PHI, 2008.*
2. Operating System Concepts – *Silberschatz and Galvin, 6th Edition, John Wiley & Sons, Inc., 2004*
3. An Introduction to Operating Systems – Concepts and Practice, *Pramod Chandra P.Bhatt, Prentice Hall Of India, 2007.*

Major Theory : Data Communications And Networking.**Unit – I:**

Data Communication: Standards Organizations – Line Configuration – Topology – Transmission Mode – Categories of Networks– Internet works – The Model – Functions of the Layers. Transmission of Digital Data: Interfaces and Modems – Digital Data Transmission – DTE – DCE Interface – Other Interface Standards.

Unit – II:

Transmission Media – Guided Media – Unguided Media – Multiplexing – Many to one / One to Many, Frequency –Division Multiplexing (FDM), Wave – Division Multiplexing (WDM), Time – Division Multiplexing (TDM).

Unit – III:

Error Detection and Correction: Types of Errors – Detection – Redundancy – Vertical Redundancy Check (VRC) – Longitudinal Redundancy Check (LRC) – Cycle Redundancy Check (CRC) – Checksum – Error Correction. Data Link Control – Line Discipline – Flow Control – Error Control.

Unit – IV:

Switching: Circuit Switching – Packet Switching – Message Switching – Integrated Services Digital Network (ISDN) – Services – History – Subscriber Access to The ISDN – The ISDN Layers – Broadband ISDN – Future of ISDN

Unit – V:

Frame Relay: Introduction – Frame Relay Operation – Frame Relay Layers – Congestion Control Leaky Bucket Algorithm – Traffic Control. Networking and Internetworking devices – Repeaters – Gateways – Other Devices – Routing Algorithms, Distance Vector Routing – Link State Routing.

Text Book:

1. Data Communications and Networking – “*Behrouz A Forouzan.*”, Tata McGraw Hill Publishing Company Limited, New Delhi. 2nd Edition 2006.

Reference Book:

1. Computer Networks – “*Andrew S. Tanenbaum.*” – Prentice Hall of India, 4th Edition, 2006
2. Data and Computer Communications “*William Stallings* Prentice Hall of India 2007

Major Theory : Multimedia Technology

UNIT – I:

Introduction: Multimedia Presentation and Production – Characteristics of Multimedia. Presentation – Multiple Media – Utilities of Multi – sensory Perception – Hardware and Software. Requirements. Digital Representation: Analog Representation – Waves – Digital. Representation – Need for Digital Representation – Analog to Digital Conversion – Digital to Analog Conversion. Text: Types of Text – Unicode Standard – Font – Insertion of Text – Text compression – File formats.

UNIT – II:

Image: Image Types – Seeing Color – Color Models – Basic Steps for Image Processing – Scanner – Digital Camera – Interface Standards – Specification of Digital Images – CMS – Device Independent Color Models – Image Processing software – File Formats – Image Output on Monitor and Printer.

UNIT – III:

Audio: Introduction – Acoustics – Nature of Sound Waves – Fundamental. Characteristics of Sound – Microphone – Amplifier – Loudspeaker – Audio Mixer – Digital Audio – Synthesizers – MIDI – Basics of Staff Notation – Sound Card – Audio Transmission – Audio File formats and CODECs – Audio Recording Systems – Audio and Multimedia – Voice Recognition and Response – Audio Processing Software.

UNIT – IV:

Video: Analog Video Camera – Transmission of Video Signals – Video Signal Formats – Television Broadcasting Standards – Digital Video – Digital Video Standards – PC Video – Video Recording Formats and Systems – Video File Formats and CODECs – Video Editing – Video Editing Software.

UNIT – V:

Animation: Types of Animation – Computer Assisted Animation – Creating Movement – Principles of Animation – Some Techniques of Animation – Animation on the Web – Special Effects – Rendering Algorithms. **Compression:** MPEG – 1 Audio – MPEG – 1 Video – MPEG – 2 Audio – MPEG – 2 Video.

Text Books:

1. Principles Of Multimedia – Ranjan Parekh, 2007, TMH.

Reference Books:

1. Multimedia: Making it Work – Tay Vaughan, 7th edition, TMH.
2. Comdex Multimedia And Web Design – Vikas Gupta, DreamTech press.2007.

Major Theory : Artificial Intelligence.

Unit – I:

What is Artificial Intelligence? – The AI Problems – What is an AI Technique? – Tic – Tac – Toe – Defining the Problem as a State Space Search – A Water Jug Problem – Control Strategies – Breadth – First Search – Depth – First Search – Heuristic Search – Problem Characteristics.

Unit – II:

Generate – and – Test – Hill Climbing – Best – First Search – The A* Algorithm – Problem Reduction – AND – OR Graphs – The AO* Algorithm – Means – Ends Analysis.

Unit – III:

Knowledge Representation Issues: Representations and Mappings – Approaches to Knowledge Representation – Using Predicate Logic – Representing Simple Facts in Logic – Representing Instance and Isa Relationships – Computable Functions and Predicates.

Unit – IV:

Game Playing: The Minimax Search Procedure – Adding Alpha – Beta Cutoffs – Planning: An Example Domain: The Blocks World – Components of a Planning System – Goal Stack Planning – Understanding: What is Understanding? – What Makes Understanding Hard?

Unit – V:

Expert Systems: Representing and Using Domain Knowledge – Expert System Shells – Explanation – Knowledge Acquisition – Perception and Action: Real – Time Search – Perception – Action – Robot Architectures.

Text Book:

1. Elaine Rich, Kevin Knight, “*Artificial Intelligence*”, Tata McGraw – Hill Publishing Company Limited, New Delhi.

Reference:

1. Stuart Russell, Peter Norving, “*Artificial Intelligence, A Modern Approach*”, PHI Learning Private Limited
2. Dan W. Patterson “*Introduction to Artificial Intelligence And Expert Systems*”, PHI Learning Private Limited

Major Theory : Web Programming.

UNIT – I:

Introduction to Internet and World Wide Web – Components to Enable Internet Access – Features of Internet Explorer and Firefox – Browser Settings – Web 2.0 – Search Engines – Content Networks – User Generated Content – Blogging – Social Networking and Media – Tagging – RIA – Web Services, Mashups, Widgets and Gadgets – Location Based Services – Web 2.0 Models.

UNIT – II:

Introduction to XHTML – Structure of XHTML Document – Headings – Links – Images – Lists – Tables – Forms – Frames – Internal Linking – Web Page Design – Introduction to CSS – Inline Styles – Embedded Style Sheets – Conflicting Styles – Linking External Style Sheets – Positioning Elements – Backgrounds – Element Dimensions – Box Model and Text Flow – Media Types – Drop Down Menu – User Style Sheets – Sample Web Applications.

UNIT – III:

Introduction to JavaScript – Structure of JavaScript – Sample Programs – Memory Concepts – Operators – I/O Structures – Control Structures: Selection and Multiple Selection Structures – Repetition Structures – break and continue Structures – Functions: Programmer Defined Functions – Function Definition – Scope Rules – Global Functions – Recursion – Example Programs.

UNIT – IV:

Arrays: Declaring and Allocating Arrays – Passing Arrays to Functions – Multidimensional Arrays – Objects: Object Technology Concepts – Various JavaScript Objects – DOM Nodes and Trees – DOM Collections – Events and Event Models – XML Basics – XML Namespaces – DTD – XML Schema Documents – XML Vocabularies – XSL – RSS – ActiveX Controls – Sample Web Applications.

UNIT – V:

Server Side Programming – Web Servers: HTTP Transactions – IIS and Apache Servers – Databases: MySQL – ADO.NET Object Model – JDBC – PHP: PHP Basics – Form Processing – Dynamic Content – ASP.NET 2.0: Introduction – Developing Sample Web Application – Web Controls – Session Tracking – Case Studies.

Text Books:

1. Deitel, Deitel, “Internet & World Wide Web–How to Program”, 4 th Edition, Pearson Education, 2009.

Major Practical : Web Programming –Lab List.

- 1) Creating simple HTML page using CSS.
- 2) Develop a text formatting application using HTML and in line CSS.
- 3) Develop a JavaScript application using conditional statements.
- 4) Develop a JavaScript application using looping statements.
- 5) Develop a JavaScript array manipulation application.
- 6) Develop a HTML table formatting application.
- 7) Develop a JavaScript application to generate day of a date entered using switch statement.
- 8) Develop a sorting application for array of names using JavaScript.
- 9) Develop a JavaScript application to generate factorial of a number using recursive function.
- 10) Display a XML data in table format using CSS.
- 11) Display a XSL formatted XML application.
- 12) Develop a auto refreshing digital clock using JavaScript.
- 13) write a drop down list application using JavaScript.
- 14) Develop a JavaScript user login application which authenticate a user.
- 15) Develop a JavaScript application to display the visitors page count.

Major Practical : Software Developing.

Rules and Regulations:

1. Software developing is a Major part of course.
2. Software developing has Internal Examination of 40 marks and External 60 marks.
3. Each student should maintained a separate observation for the Software Development.
4. Students must develop a Software from the given topic.
5. The software must be developed with in the college computer lab, Other S/W is not allowed for execution during the University Examination.
6. Students can choose any S/W language studied under this course.
7. After developing a S/W students must summit a report.
8. Staff Incharge (guide) have the right to choose a topic from the given list with the consultants of students.
9. A class is divided into several batches; Batch can have a maximum of 5 students.
10. A topic can have any number of modules; Modules should given to each batch.
11. The topic is given below.

Software Developing Topic.

1. College Administration System.
2. Hospital Administration System.
3. e_ticket Booking System.
4. Online shopping.
5. Online Examinations
6. Human resource management System.
7. Travel Management System.
8. Transport Management System.
9. Budget maintaining system.
10. Online Voting System.

Group A (Major Elective – I)

Major Elective Theory : E – Commerce

Unit – I:

Introduction to E – Commerce – Networks – Transactions – Commercial Transactions – Why use E – Commerce – Internet and other Novelties – Advantages of E – Commerce – Electronic Transactions Today – World Wide Web

Unit – II:

Security Technologies – Why Internet Is Unsecure – Internet Security Holes – Cryptography: Objectives – Codes and Ciphers – Breaking Encryption Schemes – DES – Cryptographic Applications – Digital Signature – Nonrepudiation an Message Integrity

Unit – III:

Traditional Transactions : Updating – Offline and Online Transaction – Secure Web Servers – Required Facilities – Digital Currencies and Payment Schemes – Protocol for the Public Transport – Security Protocols – Credit Card Business Basics.

Unit – IV:

Online Commerce Options – Functions and Features – Payment Systems: Electronic, Digital and Virtual Internet Payment Systems – Account Setup and Costs – Virtual Transaction Process – InfoHaus – Security Considerations.

Unit – V:

CyperCash: Model – Security – Customer Protection – Client Application – Selling through CyperCash – Servers and Commercial Environments – Payment Methods – Server Market Orientation – Netscape Commerce Server – Microsoft Internet – Servers – Smart Cards.

Text Book:

1. Pete Loshin, “Electronic Commerce”, 4th edition, An imprint ofd laxmi publications pvt .ltd, New Delhi 2004.

Reference Books

1. Jeffrey F. Rayport and Bernard J. Jaworski , “Introduction To E – Commerce”, 2nd ed, Tata Mc – Graww Hill pvt Ltd, 2003
2. Greenstein, “ E – Commerce”, Tata Mc – Graww Hill pvt Ltd, 2000.

Major Elective Theory : Data Mining and Data Warehousing.

UNIT – I:

Introduction – Data Mining Tasks – Data Mining Vs Knowledge Discovery in Databases – Data Mining Issues – Data Mining Metrics – Social Implications of Data Mining – Data Mining from a Database Perspective.

Related Concepts – Database/OLTP Systems – Fuzzy Sets and Fuzzy Logic – Information Retrieval – DSS – Dimensional Modeling – OLAP – Web Search Engines – Statistics – Machine Learning – Pattern Matching.

UNIT – II:

Data Mining Techniques – Introduction – A Statistical Perspective on Data Mining – Similarity Measures – Decision Trees – Neural Networks – Genetic Algorithms.

Classification – Introduction – Statistical Based Algorithms – Distance Based Algorithms – Decision Tree – Based Algorithms – Neural Network – Based Algorithms – Rule Based Algorithms – Combining Techniques

UNIT – III:

Clustering – Introduction – Similarity and Distance Measures – Hierarchical Algorithms – Partitional Algorithms – Clustering Large Database – Clustering With Categorical Attributes – Comparison.

Association Rules – Introduction – Large Item sets – Basic Algorithms – Parallel and Distributed Algorithms – Incremental Mining – Advanced Association Rule Techniques – Measuring the Quality of Rules.

UNIT – IV:

Data Warehousing – Definition – Delivery Process – System Process – Process Architecture – Database Schema – Partitioning Strategy – Aggregation – Data Mining – Meta Data.

UNIT – V:

System and Data Warehousing – Process Managers – Hardware Architecture – Physical Layout – Security – Back Up and Recovery – Service Level agreement – Operating Data Warehousing – Planning – Tuning – Testing the Data Warehousing.

Text Books :

1. Margaret H. Dunham and S. Sridhar, “*Data Mining Introductory and Advanced Topics*”, Pearson Education – Unit : I, II & III
2. Sam Anahory and Dennis Murray, “*Data Warehousing in the Real World, A Practical guide for Building Decision Support Systems*”, Pearson Education – Unit : IV & V

Reference :

1. Jiawei and Micheline Kamber, University Of Illinois at Urbana “*Data Mining: Concepts and Techniques 2 – ed*”, Morgan Kaufmann Publishers.

Major Elective Theory : Internet Security.

Unit – I:

Introduction: Why require a security? – Picking a Security Policy – Strategies for a Secure Network – The Ethics of Computer Security – Security Threats and levels – Security Plan (RFC 2196).

Unit – II:

Classes of Attack: Stealing Passwords – Social Engineering – Bugs and Backdoors – Authentication Failures – Protocol Failures: Information Leakage – Exponential Attacks – Viruses and Worms – Denial – of – Service Attacks – Botnets – Active Attacks.

Unit –III:

Computer Security – What are Viruse, Trojan Horse, Worms? – How to protect the computer against virus – What is the Structure of Viruse?

Unit – IV:

Firewalls and Proxy Servers – Kinds of Firewalls: Packet Filters – Application – level Filtering – Circuit – level Gateways – Dynamic Packet Filters – Distributed Firewalls – What Firewalls Cannot Do – Filtering Services: Reasonable Services to Filter – Digging for Worms – Packet Filtering – Implementing policies (Default allow, Default Deny) on proxy.

Unit – V:

Cryptography – Introduction to Basic encryption and Decryption, Diffie – Hellman Key Exchange – Concept of Public key and Private key – Digital Signatures.

Text Book:

1. William R. Cheswick, Steven M. Bellovin and Aviel D. Rubin, “*Firewalls and Internet Security: Repelling the Wily Hacker*”, Second Edition, Pearson Education.

Reference :

1. Speed , “*Internet Security :A Jumpstart For Systems Administrators And IT Managers*”, Elsevier India.
2. Behrouz Forouzan , “*Cryptography And Network Security E/2*”, Tata McGraw Hill Education.

Group B (Major Elective – II)

Major Elective Theory : Open Source Software

Unit – I:

The concept of software *freedom* – Motivations – consequences of the freedom of software – Free software before free software – The beginning: BSD, GNU – Everything in its way – A time of maturation.

Unit – II:

Brief introduction to intellectual property – Free software licences – Who are developers – What do developers do – Geographical distribution.

Unit – III:

Funding free software projects – Business models based on free software – model classifications – Impact on monopoly situations.

Unit – IV:

Impact on the public administrations – Actions of the public administrations in the world of free – cathedral and the bazaar – Leadership and decision – making in the bazaar – Free software processes – Criticism of – "The cathedral and the bazaar" – Description of environments, tools and systems – Associated languages and tools – Integrated development environments – Basic collaboration mechanisms – Source management .

Unit – V:

Linux – FreeBSD – KDE – GNOME – Apache – Mozilla – OpenOffice.org – Red Hat Linux – Debian GNU/Linux – Eclipse.

Text Book:

1. "Introduction to free software" – Third edition: September 2009 – Fundació per a la Universitat Oberta de Catalunya. – Av. Tibidabo, 39 – 43, 08035 Barcelona – Material prepared by Eureka Media, SL – © Jesús M. González Barahona, Joaquín Seoane Pascual, Gregorio Robles – Copyright © 2010, FUOC. Permission is granted to copy, distribute and modify this document either under the terms of the GNU
2. Free Documentation Licence, PDF file available in web sites.

Major Elective Theory : Systems Programming.

Unit – I:

Evolution of the Components of a Programming System – Assemblers – Loaders – Macros – Compilers – Formal Systems. MACHINE STRUCTURE, MACHINE LANGUAGE, AND ASSEMBLY LANGUAGE : General Machine Structure – Machine Language – An Assembly Language.

Unit – II:

ASSEMBLERS: General Design Procedure – Design of Assembler –Table Processing: Searching and Sorting –Linear search – Binary search – Sorting – Interchange sort – shell sort – Bucket sort – Radix Exchange sort – address calculation sort – Comparison of sorts – hash or random entry searching.

Unit –III:

MACRO LANGUAGE AND THE MACRO PROCESSOR : Macro Instructions – Features of a Macro facility – Macro Instructions Arguments – Conditional Macro Expansion – Macro calls within Macros – Macro Instructions Defining Macros – Implementation – Implementation of a Restricted Facility: A two Pass Algorithm – A single –Pass Algorithm – Implementation of Macro Calls within Macros –Implementation within a Assembler.

Unit –IV:

LOADERS : Loader schemes – Compile and –go – Loaders – General Loader scheme – Absolute loaders – Subroutine Linkages – Relocating Loaders – Direct – Linking Loaders – Other Loader Schemes – Binders, Linking Loaders, Overlays, Dynamic Binders – Design of an Absolute Loader – Design of a Direct – Linking Loader – Specification of problem – Specification of Data Structure – format of data bases – Algorithm.

COMPILERS : PART 1

Statement of Problem – Recognizing Basic Elements – Recognizing Syntactic Units and Interpreting meaning – Intermediate Form – Storage Allocation – Code generation – Optimization(Machine – independent) – Optimization(Machine – dependent) – Assembly Phase – General Model of Compiler

Unit – V:

PART 2: Phases of the Compiler – Lexical Phase – Syntax phase – Interpretation Phase – Optimization – Storage assignment – Code Generation – Assembly Phase – Phase of a Compiler.

PART – 3 – Data structures – Recursion, call, and return Statements – Storage Classes – use – Implementation – Block structure – Nonlocal go to's – Interrupts – Pointers.

Text Book:

1. “Systems Programming”, John J. Donovan, McGraw – Hill International Editions.

Major Elective Theory : Parallel Computing.

Unit – I:

Introduction to Parallel Processing – Definition – Serial Vs Parallel Communication – Data Transfer Modes – Why use Parallel Processing – Parallel Processing Architecture – Types of Parallelism – Multi Processing – SISD – SIMD.

Unit – II:

Introduction To Distributed Environment – Introduction – Client – Server Paradigm – Threads in Distributed Systems – Remote Procedure Call – Remote Object Invocation – Message Oriented Communication – Unicasting – Group Communication – Reliable and Unreliable Multicasting

Unit – III:

Designing Parallel Algorithms – Methodological design – Partitioning – Communication – Agglomeration – Mapping – Design and Development of Parallel Processing Systems – Unix Work station clusters.

Unit – IV:

Master Slave Programming – Threads and Multi Threaded Programming – Scheduling – Concurrency – MISD – MIMD – Semaphore – DeadLock – LiveLock – Designing Parallel Programs.

Unit – V:

Introduction to Fault Tolerance – Distributed Commit Protocol – Distributed File System Architecture – Issues in Distributed File Systems – Distributed Object – Based System – CORBA – COM.

Text Book:

1. An Introduction to Parallel Computing, Design and Analysis of Algorithms, 2nd edition, A.Grama, V. kumar, A. Gupta, Addison Wesley, 2003
4. Parallel computing: Theory and Practice, M J Quinn, McGraw Hill,1996. Parallel Processing Architecture – Introduction to Computers and Information Technology, D. Glory Ratna Mary, S. Selvanayahi, V. Joseph Peter, Shekina Publications.

Reference Books:

1. Mukesh Singhal, “Advanced Concepts In Operating Systems”, McGraw Hill Series in computer science, 1994.
2. George Coulouris, Jean Dollimore, Tim Kindberg, “Distributed Systems Concepts and Design”, Third Edition, Pearson Education Asia,2002.

Skilled Based Subject Syllabus

Semester III

Skilled based subjects are practical oriented. One hour should be assigned for tutorial class and three hours of practical to do the given practical list.

Sample should be provided to the students for designing the given list.

Subject : DTP

Page Maker

1. Design of ID card (3''*2'')
2. Design visiting card(3.5''*2'').
3. Design of an attractive invitation card(5.5''*8'')
4. Design letter pad(7.5''*9'').
5. Preparation of a small booklet with 6 pages(3.5''*4.5'').
6. Design a hand bill(5.5''*8.5'')
7. Create a advertisement for your college.
8. Design your college progress card.
9. Create a receipt bill with counter foil.
10. Create a graph/pie chart.

Photoshop

1. Design of a brochure for an institution.
2. Seasonal greeting card.
3. Transporting an image from one background to another.
4. Design a web page poster(1004*750)/textbook cover page.
5. Crop an image/rotate an image.

CorelDRAW

1. Create an object and fill with multiple colours.
2. Design a book cover.
3. Create a frame and enter a paragraph with different formats of text.
4. Export any five image in a single applications.
5. Design page frame by inserting image and objects.

Skilled Based Subject Syllabus

Semester V

Skilled based subjects are practical oriented. One hour should be assigned for tutorial class and three hours of practical to do the given practical list.

Sample should be provided to the students for designing the given list.

Subject : Animation Applications.

FLASH

1. Create a simple Presentation.
2. End a movie clip using Script.
3. Start a graphic animation at a specific frame.
4. Text animation using motion tweening.
5. Activate a new window/page using buttons.
6. Bouncing ball with sound effect.
7. Create a scrolling gallery in a page.

DREAMWEAVER

1. Creating a New Dreamweaver Site
2. Adding Images, Text and Links
3. Flash Buttons and Flash Text
4. Create a Rollover Images
5. Creating Tables – FAQs
6. Designing Web Pages with Frames
7. Inserting and Formatting a Table in Standard View
8. Design navigation Bar with Images

NON – MAJOR ELECTIVE PAPERS – I :

Other than B.Sc (IT), B.Sc(CIT) &B.Sc (ISM).

INTRODUCTION TO INFORMATION TECHNOLOGY.

Unit – I:

Information Technology Basics: Introduction , Information, Technology, Information technology, Present Scenario, Role of Information Technology, Information technology and internet, Careers in IT industry. Computer organization and Architecture: Central Processing Unit, Inside a computer, Data representation in Computer, Coding Schemes.

Unit – II:

Computer Memory and Storage Introduction, memory hierarchy, Random Access Memory (RAM) , Read only memory (ROM), RAM, ROM and CPU Interaction, Types of Secondary storage devices, Magnetic tape, magnetic disk, types of magnetic disk, optical disk, type of optical disks.

Unit – III:

Input Output Media: Introduction, types of input devices, types of output devices. Multimedia Essentials: Introduction, Multimedia: Definition, Building blocks of multimedia, multimedia system, multimedia applications, Virtual reality.

Unit – IV:

The Internet : Introduction, Evolution of Internet – Basic Internet terms – Getting connected to Internet – Internet Applications – Data over Internet. Internet tools: Introduction – Web Browser – Browsing Internet using Internet Explorer – E – Mail – Search engines – Instant messaging.

Unit – V:

Emerging trends in IT: Introduction, E – Commerce –Electronic Data Interchange – Mobile Communication – Bluetooth – Global Positioning System – Infrared Communication – Smart Card – Imminent Technologies.

Text Book:

1. Introduction to Computers and Information Technology, D. Glory Ratna Mary, S. Selvanayahi, V. Joseph Peter, Shekina Publications.

Reference Books:

1. Introduction to Information Technology ITL Education Solutions Limited, Pearson Education.
2. Fundamentals of Information Technology By Alexis Leon & Mathews Leon Vikas publication – New Delhi.

NON – MAJOR ELECTIVE PAPERS – II .
Other than B.Sc (IT), B.Sc(CIT) &B.Sc (ISM).
BASIC PROGRAMMING DESIGN

Unit – I :

Introduction – Algorithms, Flowcharts, Types of Programming languages, Selection of Programming languages, Program writing Debugging.

Unit – II :

Flow Charts – Elementary Concepts. – Introduction, Kinds of flow charts, symbols used in flow charts, Advantages of flow charts, examples, constants and variables.

Unit – III :

Flow Charting Simple Computations. – Introduction, illustrating examples, conclusions.

Unit – IV :

Subscripted Variables – Introduction, basic concepts of subscripted variables, one dimensional array, illustrating examples, conclusions.

Unit – V :

Multidimensional Arrays. – Introductions, definitions, matrix operations, illustrating examples,

beyond two dimensions, conclusions. – Introduction To File Structure.

Introduction, Concept of data files, Types of data files, File Organization methods, File processing activities, Conclusions.

Text Book:

1. Basic Programming Design. D.S. Arul Selvan & A. A. Regieson Sylum Shalom Publications, Green St, Nagercoil.

Reference:

1. Insight into Flowcharting. Raj K. Jain. By S. Chand & Company ltd.

APPENDIX – AZ52

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI - 12

B.Sc. Degree Course in Information Science and Management (CBCS).

Full-Time - 6 Semesters.

Syllabus for III & VI Semester.

With Effect From academic year (2012-2013).

Title Of The Subject		Teaching Hours.	Credits
III SEMESTER			
Part III Core	Major - III Principles of Management	6	4
	Major - IV Advanced Java Programming	6	4
	Major Practical - III Advanced Java Programming Lab	6	4
Part IV	Skill Based Subject – I (DTP)	4(1T & 3P)	4
	Non - Major Elective - I	2	2
	Allied Subject - II Theory - Accountancy	4	2
	Allied Practical - Accountancy (Tally)	2	2
	Total	30	22
IV SEMESTER			
Part III Core	Major - V Relational Database Management System	6	4
	Major Practical - IV Relational Database Management System Lab	6	4
Part IV	Common Skill Based Subject	4	4
	Non - Major Elective - II	6	2
	Major Elective - I (Group - A)	6	5
	Allied Subject - II Operations Research & Numerical Analysis	4	4
	Allied Practical - Accountancy (Tally Lab)	2	2
Part V	Extension Activity		1
	Total	30	26

V SEMESTER			
Part III Core	Major - VI .Net Programming	4	4
	Major - VII Software Engineering	4	4
	Major - VIII Operating System	4	4
	Major Practical - V .Net Programming Lab	8	4
	Major Elective - II (Group - B)	6	5
Part IV	Skill Based Subject – II (Animation Applications)	4(1T & 3P)	4
	Total	30	25
VI SEMESTER			
Part III Core	Major - IX Data Communications And Networking	4	4
	Major - X Marketing Management	4	4
	Major - XI Enterprise resource planning	4	4
	Major - XII Web Programming	4	4
	Major Practical - VI Web Programming Lab	8	4
	Major Practical- VII Software Developing	6	5
	Total	30	25

Major Elective	
Major Elective - I (Group - A)	Mobile Computing.
	Internet Security.
	Wireless Application Protocol.
Major Elective - II (Group - B)	Human Resource Management.
	Financial Management.
	E_Commerce.

Major Theory: Principles of Management.

UNIT – I:

INTRODUCTION – PRINCIPLES & THINKERS – Definition – Features of Management – Administration Vs Management – Management a Science or Art? – Management a Profession – Management Principles & their nature – Universality of Management Principles – The functional approach to Management – Management function and Management levels – Pioneers of Modern Management – F.W.Taylor – Elton Mayo – M.P.Follet .

UNIT – II:

PLANNING AND DECISION MAKING – Meaning – Characteristics – Planning Process – Types of Plans Objectives – M.B.O – Policies – Procedures – Methods – Rules – Programmes – Budgets – Forecasting – Elements – Techniques – Decision making – Definition – Nature & Types of Decisions – Process.

UNIT – III:

ORGANISING – Meaning – Principles of Organization – Departmentation – It's Methods – Span of Management – Forms of Organization structure – Concepts of Authority and responsibility – Delegation & Decentralisation of Authority – Centralisation Vs Decentralisation – Advantages & Drawbacks – Line & Staff relation .

UNIT – IV:

STAFFING – Meaning – Manpower Planning – Aim and Objectives – Steps in Manpower Planning – Recruitment – Selection – Training – Performance Evaluation – Executive Development.

UNIT – V:

DIRECTING & CONTROLLING – Definition – Principles & Elements of Direction – Importance of Controlling – Steps in Controlling – Essentials of Control – Techniques.

Text Book:

1. L.M.Prasad – Principles & Practices of Management – Sixth Edition – 2001 – Sultan Chand And Sons.

Reference Books:

1. Herold Koontz,Weihrich – Management – Ninth Edition – 1988 – McGraw Hill Book co
2. James A.F.Stoners – R.Edward Freeman – Management – Fifth Edition – 1992 – Prentic Hall India (P)Ltd.
3. Govindarajan & Natarajan – Principles of Management – Prentic Hall India (P)Ltd.

Major Theory : Advanced Java Programming

UNIT – I:

The Genesis of Java – Overview of Java – Development of Java – JDE – Data Types – Variables – Arrays – Type Conversion and Casting – Operators –Precedence – Control Statements.

UNIT – II:

Introducing Classes – Objects – OOP,s Concepts – Declaring Objects – Introducing Methods – Constructors – Overloading – this keyword – Garbage collection – finalize() method – More Examples. – Objects as parameter – returning objects – recursion – Access Control – static – final – Nested and Inner classes – Command line arguments – Sample Programs.

UNIT – III:

String and String Buffer Class Inheritance – Types of Inheritance – Method Overriding – Dynamic method Dispatch – Abstract Class – Final with Inheritance – More Examples. – Packages – Access Protection – Importing Packages – Interfaces – Implement and Applying Interfaces – Sample Programs.

UNIT – IV:

Exception Handling – Exception Types – Our Own Exception – Handling Exception – Java's Built in Exception – Thread Class and Runnable Interface – Extending Thread – Creating Multiple Threads – `isAlive()` and `join()` methods – Synchronization – `suspend()`, `resume()` and `stop()` threads – Example Programs

I/O packages – Input Stream – Output Stream – File Input and Output Stream – Applet Class – An Applet Skeleton – Simple Applet Display Methods – Example Programs

UNIT – V:

Event Handling – Delegation Event Model – Event classes – Sources of Events – Event Listener Interface – AWT controls – Labels – Buttons – Check Boxes – Check Box Group – Lists – Scroll Bar – Text Area – Menu Bars and Menu – Lay out Managers – Examples

Text Book :

1. Herbert Schildt, "*Java 2*", Fourth Edition, Tata McGraw – Hill Publishing Company Ltd New Delhi .

Reference :

1. Peter Norton and William Stanek, "*Guide To Java Programming*", Techmedia, New Delhi
2. Martin Rinehart, "Java Database Development", ed – 1998, Tata McGraw – Hill Publishing Company Ltd New Delhi .

Major Practical : Advanced Java Programming –Lab list.

1. Create a Simple program with your own detail.
2. Use Overload(i) Method (ii) Constructor
3. Create a Program for object as parameters and returning objects.
4. Create a program with abstract class.
5. Create a program Using Multilevel Inheritance.
6. Develop a Program using Interface
7. Create and Import package(Minimum Three classes)
8. Create Our Own Exception for Employees.(Constraints 1.Age>18 and<58) 2. Dept No 10||20||30||40)
9. Suspend, Resume and Stop Threads(Minimum 3 Threads)
10. Read and write the content of a file using I/O package
11. Display a Simple Banner Applet
12. Event Handling Mechanism for Key board and Mouse
13. Create a Login form.
14. Simple Web Presentation using HTML tag(Use 3 Pages)
15. Create a Program for Movig Ball(Start and Stop)
16. Create a simple Java database with 4 fields.

Allied Theory : Accountancy.

Unit – I:

Accounting – Definition and functions – Accounting Conventions Concepts – System of Accounting – Rules for Double Entry System of Book Keeping – Preparation of Journal and Ledger Accounting.

Unit – II :

Subsidiary Books – Purchase Book – Sales Book – Purchase Returns Book – Sales Return Book – Cash Book – Bank Reconciliation Statement (BRS).

Unit – III:

Preparation of Trial Balance – Final Accounts – Manufacturing, Trading, Profit and Loss Accounts and Balance Sheet with Simple Adjustments.

Unit – IV:

Depreciation – Methods of Depreciation – Straight Line Method and Diminishing Balance Method. Cost Accounting – Elements of Costing – Type of Costing – Preparation of Simple Cost Sheets – Labor Cost Accounting.

Unit – V:

Nature and Objectives of Business – Internal organizational structure of Business – Unit Marketing Management and its Functions – Production Management – Objectives and Functions – Quality control, inventory control – Personnel Management, Objectives and Functions.

Text Book:

1. T.S.Grewal, Introduction To Accountancy, S.Chand & company. New Delhi.
2. Jain & Narang, Cost Accountancy, Kalyani publishers, Ludhiana.
3. Y.K.Bhusan, Business Organization And Management,

Reference Book:

1. Khan and Jain “ Financial Management” Tata McGraw Hill

Allied Practical: Accountancy Tally Lab List.

1. Specimen journal entries of Bills of exchange
2. Model journal entries of joint venture and books of accounts
3. Bank reconciliation statements
4. Comparison of Pass Book and Cash Book
5. Prepare an average due date
6. Creation of Sales day book
7. How to create a Balance sheet
8. Create a Sales invoice
9. Create a Company as “Sagar Industries Ltd.” in Tally with inventory management.
10. Create the Trial Balance and Balance Sheet of “Sugar Industries Ltd.”
11. Show the Cash Book & Bank Book for the company.

Major Theory : Relational Data Base Management System.

Unit – I:

Introduction: Purpose of Database Systems – Data Models – Database Languages – Transaction Management – Storage Management – DBA – Database Users – System Structure. E – R Model – Entities and Entity sets – Relationship Sets – Mapping Constraints – E – R Diagram.

Unit – II:

Structure of Relational Databases – Relational Algebra – Tuple Relational Calculus – Domain Relational Calculus – Integrity Constraints – Normalization – Boyce – Codd Normal Form – Third Normal Form – Fourth Normal Form – Domain – Key Normal Form.

Unit – III:

Basic SQL Operations – Creating a table – Insert – Rollback – Commit – Auto commit – Delete – Update – Select, From, Where and Order by – single value tests – LIKE – simple tests against a list of values – Combining logic – Combining tables – Dropping tables – Dropping a column – Creating a table from a table – Data functions – Conversation functions – Translate – Decode – Creating a view – Advanced subqueries – Outer joins – Natural and Inner joins – Union, Intersect & Minus – Synonyms – Indexes – Tables spaces – Clusters – Sequences .

Unit – IV:

Basics of Object – Relational Databases: Objects – Abstract Data types – Nested tables – Varying arrays – Large Objects – References Object views – Naming conventions for objects – structure of an object.

Users, Roles and Privilege: Creating a user – Password management – Three Standard roles – Format for grant command – Revoking privileges – What users can Grant: Moving to another user – Create synonym – Create a role – Granting privileges to a role – Granting a role to another role – Adding Password to a role – Removing password from a role – Enabling & Disabling roles – Revoking privilege from a role – Drop role.

Unit – V:

An introduction to PL/ SQL: PL/SQL Overview – Declarations section – Executable commands section – Exception handling section – Triggers : Syntax – Types of Triggers : Row – Level – Statement – level – before &after – Instead of Schema – Database – Level Triggers – Enabling & Disabling triggers – Replacing & Dropping triggers – Procedures, Functions & Packages: Syntax – Compile – Replace – Drop Procedure , Functions & Packages – Cursor Management.

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan “*Database System Concepts*” McGraw – Hill Education, 2010
2. Kevin Loney, George Koch And the Experts at TUSC, “*ORACLE 9i The Complete Reference*”, Tata McGraw – Hill Publishing company Ltd., New Delhi,

Reference:

1. Rajesh Narang_ “*Database Management Systems*”, PHI Learning Pvt. Ltd., 2006.
2. Raghu Ramakrishnan, Johannes Gehrke, “*Database Management Systems*”, McGraw – Hill Education, 2002.
3. Michael Abbay, Mike Corey, Ian Abramson, “*ORACLE 9i A Beginner’s Guide*”, Tata McGraw – Hill Publishing company Ltd., New Delhi, 2002.

Major Practical : Relational Data Base Management System – Lab List.

1. Create a simple table and write three queries to process a table.
2. Demonstrate query processing using aggregate operators.
3. Write oracle code for demonstrating the correlated sub queries.
4. Write oracle code to create employee records and delete the retired employees and store it on to another table with same structure.
5. Create a course table and create a procedure that displays the instructor details, class details and student details of a particular table which the user inputs.
6. Write a database trigger before insert for each row on the course table not allowing transactions on Sundays and Saturdays.
7. Create a package that contains overloaded functions for
 - i. Adding five integers
 - ii. Subtracting two integers.
 - iii. Multiplying three integers.
8. Write PL/SQL block to increase the salary by 10% if the salary is >2500 and < 3000.
9. Write PL/SQL block to display the names of those employee getting salary >3000. Create and insert records into the following tables. (Insert minimum 10 records in each table).
10. Create Student information table.
11. Create Department information table
12. Create Instructor’s information table
13. Create Course information table
14. Create Schedule type details.
15. Create Student grade information table in PL/SQL.

Allied Theory : Operation Research and Numerical Analysis.**UNIT – I:**

Transportation Problem: Introduction – General Transportation Problem – The Transportation Table – Formulation of the Transportation Problem – Triangular Basis in a Transportation Problem – Finding an initial basic feasible solution: North West corner rule – Least – Cost Method or Matrix Minima Method – Vogel’s Approximation Method.

UNIT – II:

Assignment Problem: Introduction – Mathematical formulation of the problem – The Assignment method – The Travelling Salesman Problem.

UNIT – III:

Sequencing Problem: Introduction – Problem of Sequencing – Basic terms used in sequencing – Processing n jobs through two machines – Processing n jobs through k machines – Processing 2 jobs through k machines.

UNIT – IV:

Simultaneous equations – Back substitutions – Gauss Jordan elimination method – Calculation of inverse of a matrix – Gauss – Seidel iteration method.

UNIT – V:

Difference Operators – Newton’s interpolation formula – Lagrange’s interpolation formula – Divided difference interpolation – Inverse interpolation.

Text Books :

1. Kanti Swarup, P.K. Gupta and Man Mohan, “*Operations Research*”, Sultan Chand & Sons, New Delhi – Unit : I, II & III
2. S. Arumugam, A. Thangapandi Isaac and A. Somasundaram, “*Numerical Analysis*”, New Gamma Publishing House, Palayamkottai – Unit : IV & V

Reference :

1. T. Sankaranarayanan, Joseph A. Mangaladoss, “*Operations Research*”, Suja Publishing House, Tirunelveli
2. R. Panneerselvam, “*Operations Research*”, 2nd Edition, PHI Learning (2011), New Delhi.
3. Vasishtha, “*Numerical Analysis*”, Krishna Prakashan Media (P) Ltd. (2010), Meerut.

Major Theory : .Net Programming.**UNIT – I:**

The .NET Frame Work – Learning the .NET languages – Introduction To ASP.NET and IIS – Types, Objects and Name Spaces – ASP.NET Application – Building ASP.NET Website.

UNIT – II:

Web Form Fundamentals – HTML controls – Web Controls – Validation Controls – Navigation Controls – Data Controls – Login Controls – CSS – Working with CSS in Web Developer – More Programs.

UNIT – III:

State Management – Session – View – Query String – Cookies – Tracing – Logging – Error Handling – User Controls – ASP.NET Ajax – Example Programs.

UNIT – IV:

ADO.NET – Over View of ADO.NET – ADO.NET Access – Data Binding – Data List – DATA Grid and Repeaters – Working with Database – Sample Programs.

UNIT – V:

XML – Using XML – XSD – XSLT – Web Services – Creating Web Services – Using Web Services – Caching – ASP.NET Security

Text Book :

1. Mathew Mac.Donald, “*ASP.NET The Complete Reference*”, Tata McGraw – Hill Publishing Company Ltd New Delhi .
2. Imar Spanjaars, “ASP.NET 3.5 in c# and V.B “, Wiley India Pvt Ltd.

Reference :

1. O'REILLY ,Jesse Liberty, Dan Hurwitz and Brian Mac Donald, “*Learning ASP.NET 3.5*”, II Edition.

Major Practical: .Net Programming – Lab List

1. Arithmetic Operations Using Text Box and Button
2. Adding and Removing Items in runtime using Drop down list and List Box
3. Upload and display Image using File Up Load Control.
4. Display Date, Day, Month, Year, Day of Week, Day of the Year using Calendar Control.
5. Create an Advertisement using Ad rotator Control.
6. Create a Registration form and apply ASP.NET validation Controls.
7. Binding data in Grid View using source.
8. Create small pay roll
9. Create user control with Source.
10. Create a Login page using session variable
11. Create Student Mark list using SQL Provider.
12. Gridview Edit, Update, Cancel and Delete using source.
13. Create a Crystal Report
14. Create a Simple Web Page Using CSS
15. Create a Master Page.

Major Theory : Software Engineering**Unit – I:**

Software Engineering: Definition – Software Engineering Activities, Skills and Challenges –Components of Software Engineering: SSAD and OOSAD – Software Life Cycle Model – Software Development Model – CMM for Process Improvement – Software Process Model – Software Estimation: Size Effort and Cost: Software Metrics: Introduction – Estimation of Effort and Schedule – COCOMO – Software Cost Estimation.

Unit – II:

Software Quality Assurance – Testing Technique for SQA – Software Testing Strategies – Software Engineering Tools – Introduction – Analysis Tools – Requirements Engineering – Work Breakdown Structure – Prototyping – System Analysis – System Modeling – Structured System Analysis – Software Requirement Specification.

Unit – III:

System Design: Introduction – Data Structure and Database Design – Design Development Process – System Design Architecture – Systems Behavior design – Architecture and Choices – Architecture and Non – functional Requirements – Design Specification Documentation – User Interface Design – User Interface Analysis and Design – Guidelines for Designing UI Components – Procedural Design.

Unit – IV:

Object Oriented Approach and Technology – Basis of Objects – Object Properties – Object Oriented System Development Cycle – UML – Static Class Diagrams – Use Case Diagrams – Behavior Diagrams.

Unit – V:

Software Project Management: Introduction – Basic Concepts – Project Management – Software Development Process Management – Management of Software Workflows – Evaluation of Workflow Process – Integration of Software Engineering Management and Project Life Cycle – Testing for Quality – Functional Testing – System Testing – User Satisfaction Testing – Test Cases and Test Plans – Software System Maintenance.

Text Book:

1. Waman S Jawadekar, “*Software Engineering Principles and Practice*”, Tata McGraw – Hill Education Private Limited, New Delhi.

Reference :

1. Roger S. Pressman, “*Software Engineering, A Practitioner’s Approach*”, McGraw – Hill Higher Education.
2. Timothy C. Lethbridge and Robert Laganieri, “*Object – Oriented Software Engineering*”, Tata McGraw – Hill Publishing Company Limited, New Delhi.
3. Ian Sommerville, “*Software Engineering*”, Pearson Education Pte. Ltd., Delhi.

Major Theory : Operating System**Unit – I:**

Operating system – What is an Operating System? – Computing System Architecture: Desktop Systems – Multiprocessor Systems – Distributed processing – Clustered Systems – Hand held systems – functions and Structure: Different services of the operating system – users of system calls – issue of portability – users view of the operating system – Graphical user interface – operating system structure – virtual machine – booting.

Unit – II:

Information Management: File System – Device Driver – Terminal I/O – CD – ROM.
Process management: Introduction – what is process? Evolution of multiprogramming – Context switching – process states – process state transitions – process control block – process hierarchy – operation on a process – create a process – kill a process – dispatch a process – change the priority of a process – block a process – dispatch a process – time up a process – wake up a process – Suspend / resume operation – Process scheduling – Multithreading.

Unit – III:

Inter Process communication: the producer / Consumer problems – solutions to the producer consumer problems – Classical IPC Problems.

Deadlocks: Introduction – Graphical representation of deadlock – deadlock prerequisites – deadlock strategies.

Unit – IV:

Memory Management: Introduction – Single Contiguous memory management – fixed partition memory management – variable partitions – non contiguous allocation – paging – segmentation – combined system – virtual memory management system.

Unit – V:

Information Management: File System – Device Driver – Terminal I/O – CD – ROM.
Case Study: LINUX – Introduction – UNIX and LINUX: A Comparison – Process Management – Process Scheduling – Memory Management – File Management – Device Drivers – Security;

Text Book:

1. Operating Systems – Achyut S Godbole, *Tata McGraw – Hill Publishing Company, New Delhi, 2nd Edition, 2005.*

References:

1. Operating Systems, Internals and Design Principles, *William Stallings, PHI, 2008.*
2. Operating System Concepts – *Silberschatz and Galvin, 6th Edition, John Wiley & Sons, Inc., 2004*
3. An Introduction to Operating Systems – Concepts and Practice, *Pramod Chandra P.Bhatt, Prentice Hall Of India, 2007.*

Major Theory : Data Communications And Networking.**Unit – I:**

Data Communication: Standards Organizations – Line Configuration – Topology – Transmission Mode – Categories of Networks– Internet works – The Model – Functions of the Layers. Transmission of Digital Data: Interfaces and Modems – Digital Data Transmission – DTE – DCE Interface – Other Interface Standards.

Unit – II:

Transmission Media – Guided Media – Unguided Media – Multiplexing – Many to one / One to Many, Frequency – Division Multiplexing (FDM), Wave – Division Multiplexing (WDM), Time – Division Multiplexing (TDM).

Unit – III:

Error Detection and Correction: Types of Errors – Detection – Redundancy – Vertical Redundancy Check (VRC) – Longitudinal Redundancy Check (LRC) – Cycle Redundancy Check (CRC) – Checksum – Error Correction. Data Link Control – Line Discipline – Flow Control – Error Control.

Unit – IV:

Switching: Circuit Switching – Packet Switching – Message Switching – Integrated Services Digital Network (ISDN) – Services – History – Subscriber Access to The ISDN – The ISDN Layers – Broadband ISDN – Future of ISDN

Unit – V:

Frame Relay: Introduction – Frame Relay Operation – Frame Relay Layers – Congestion Control Leaky Bucket Algorithm – Traffic Control. Networking and Internetworking devices – Repeaters – Gateways – Other Devices – Routing Algorithms, Distance Vector Routing – Link State Routing.

Text Book:

1. Data Communications and Networking – “Behrouz A Forouzan.”, Tata McGraw Hill Publishing Company Limited, New Delhi. 2nd Edition 2006.

Reference Book:

1. Computer Networks – “Andrew S. Tanenbaum.” – Prentice Hall of India, 4th Edition, 2006
2. Data and Computer Communications “William Stallings Prentice Hall of India 2007

Major Theory : Marketing Management.**Unit – I:**

Definition and meaning of marketing – Modern concept of Marketing – Marketing and selling – Marketing functions – buying transportation – warehousing – standardization – Grading – Packaging.

Unit – II:

Buyer’s behaviour – Buying motive – Market segmentation – Marketing strategies – product development – , introduction of new product – branding – packaging brand loyalty – product life cycle.

Unit – III:

Pricing methods and strategies – physical Distribution – wholesaler and retailer – Services rendered by them.

Unit – IV:

Promotional methods – Advertising – Publicity – Personal selling – Sales Promotion

Unit – V:

Marketing Research – importance in Marketing decisions – Interactive marketing – Use of Internet – Online auction – Recent.

Text Book:

1. Marketing by Rajan Nair – Sultan Chand Company (or)
2. Marketing management by Sherleka

Major Theory : Enterprise Resource Planning.**UNIT – I:**

Business function and Business process: Functional areas and Business Process – functional area of operations – Business process – Marketing Sales – supply chain management – Accounting and finance – Human Resource – Functional areas of information system – The development of ERP system SAP R/3 – New directions in ERP – significance and benefits of ERP software and systems.

UNIT – II:

Marketing information system and sales order process in ERP: sales and Distribution in ERP – Pre sales activities – sales order processing – inventory Sourcing – Delivery – Billing – payment – Customer relationship Management – benefits of CRM.

UNIT – III:

Production and supply chain management information system: Production overview – The production planning process – The SAP ERP Approach to production planning – Sales forecasting – sales and operation Planning – Demand management – Material requirement planning in SAP ERP – ERP and supplier – supply chain.

UNIT – IV:

Accounting in ERP : Accounting activities – using ERP for accounting Information – operational decision making problem – credit management –Industrial credit management in SAP ERP – product profitability analysis – Management reporting with ERP system – Document flow for customer Service.

UNIT – V:

Human resource process in ERP: HR with ERP – Advance HR features – Time management – Payroll – Travel management – Training and Development – Management by objectives – ERP process modeling

Text Book:

1. Enterprise Resource Planning – Ellen Monk And Bret Wagner – 3rd edition – MGH.

Major Theory : Web Programming

UNIT – I:

Introduction to Internet and World Wide Web – Components to Enable Internet Access – Features of Internet Explorer and Firefox – Browser Settings – Web 2.0 – Search Engines – Content Networks – User Generated Content – Blogging – Social Networking and Media – Tagging – RIA – Web Services, Mashups, Widgets and Gadgets – Location Based Services – Web 2.0 Models.

UNIT – II:

Introduction to XHTML – Structure of XHTML Document – Headings – Links – Images – Lists – Tables – Forms – Frames – Internal Linking – Web Page Design – Introduction to CSS – Inline Styles – Embedded Style Sheets – Conflicting Styles – Linking External Style Sheets – Positioning Elements – Backgrounds – Element Dimensions – Box Model and Text Flow – Media Types – Drop Down Menu – User Style Sheets – Sample Web Applications.

UNIT – III:

Introduction to JavaScript – Structure of JavaScript – Sample Programs – Memory Concepts – Operators – I/O Structures – Control Structures: Selection and Multiple Selection Structures – Repetition Structures – break and continue Structures – Functions: Programmer Defined Functions – Function Definition – Scope Rules – Global Functions – Recursion – Example Programs.

UNIT – IV:

Arrays: Declaring and Allocating Arrays – Passing Arrays to Functions – Multidimensional Arrays – Objects: Object Technology Concepts – Various JavaScript Objects – DOM Nodes and Trees – DOM Collections – Events and Event Models – XML Basics – XML Namespaces – DTD – XML Schema Documents – XML Vocabularies – XSL – RSS – ActiveX Controls – Sample Web Applications.

UNIT – V:

Server Side Programming – Web Servers: HTTP Transactions – IIS and Apache Servers – Databases: MySQL – ADO.NET Object Model – JDBC – PHP: PHP Basics – Form Processing – Dynamic Content – ASP.NET 2.0: Introduction – Developing Sample Web Application – Web Controls – Session Tracking – Case Studies.

Text Books:

1. Deitel, Deitel, “Internet & World Wide Web–How to Program”, 4 th Edition, Pearson Education, 2009.

Major Practical : Web Programming – Lab List.

- 1) Creating simple HTML page using CSS.
- 2) Develop a text formatting application using HTML and in line CSS.
- 3) Develop a JavaScript application using conditional statements.
- 4) Develop a JavaScript application using looping statements.
- 5) Develop a JavaScript array manipulation application.
- 6) Develop a HTML table formatting application.
- 7) Develop a JavaScript application to generate day of a date entered using switch statement.
- 8) Develop a sorting application for array of names using JavaScript.
- 9) Develop a JavaScript application to generate factorial of a number using recursive function.
- 10) Display a XML data in table format using CSS.
- 11) Display a XSL formatted XML application.
- 12) Develop a auto refreshing digital clock using JavaScript.
- 13) Write a drop down list application using JavaScript.
- 14) Develop a JavaScript user login application which authenticate a user.
- 15) Develop a JavaScript application to display the visitors page count.

Major Practical : Software Developing.

Rules and Regulations:

1. Software developing is a Major part of course.
2. Software developing has Internal Examination of 40 marks and External 60 marks.
3. Each student should maintain a separate observation for the Software Development.
4. Students must develop Software from the given topic.
5. The software must be developed with in the college computer lab, Other S/W is not allowed for execution during the University Examination.
6. Students can choose any S/W language studied under this course.
7. After developing a S/W students must submit a report.
8. Staff Incharge (guide) have the right to choose a topic from the given list with the consultants of students.
9. A class is divided into several batches; Batch can have a maximum of 5 students.
10. A topic can have any number of modules; Modules should given to each batch.
11. The topic is given below.

Software Developing Topic.

1. College Administration System.
2. Hospital Administration System.
3. E_Ticket Booking System.
4. Online shopping.
5. Online Examinations
6. Human resource management System.
7. Travel Management System.
8. Transport Management System.
9. Budget maintaining system.
10. Online Voting System.

Group A (Major Elective – I)
Major Elective Theory : Mobile Computing

UNIT – I :

Introduction: Mobility of Bits and Bytes –Wireless The Beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and services – Developing Mobile computer Applications – security in mobile computing – Standards _ Why is it necessary – Standard bodies. MOBILE COMPUTING ARCHITECTURE: History of computers and Internet – Architecture for mobile computing – Three – tier architecture – Design considerations for mobile computing – Mobile computing through Internet – Making exiting applications mobile enabled.

UNIT – II:

MOBILE COMPUTING THROUGH TELEPHONY: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application – Voice XML – TAPI.

UNIT – III:

EMERGING TECHNOLOGIES: Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 –Java Card. GSM : Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency allocations – Authentications and Security – SMS.

UNIT – IV

GPRS – GPRS and packet data network – GPRS network architecture – GPRS network operations – Data services in GPRS – Application for GPRS – Limitations – Billing and Charging. WAP : MMS – GPRS Applications.

UNIT – V :

CDMA and 3G: Spread spectrum technology – Is 95 – CDMA vs GSM – Wireless Data – Third generation networks – Applications on 3G WIRELESS LAN: Wireless LAN advantages – IEEE 802.11 standards – Architecture – Mobile in Wireless LAN – Deploying wireless LAN – Mobile adhoc networks and sensor networks – Wireless LAN Security – WiFi vs 3G .

Text Book:

1. Mobile Computing, Asoke K Talukder , Roopa R Yavagal, TMH, 2005.

Major Elective Theory : Internet Security.

Unit – I:

Introduction: Why require a security? – Picking a Security Policy – Strategies for a Secure Network – The Ethics of Computer Security – Security Threats and levels – Security Plan (RFC 2196).

Unit – II:

Classes of Attack: Stealing Passwords – Social Engineering – Bugs and Backdoors – Authentication Failures – Protocol Failures: Information Leakage – Exponential Attacks – Viruses and Worms – Denial – of – Service Attacks – Botnets – Active Attacks.

Unit – III:

Computer Security – What are Viruse, Trojan Horse, Worms? – How to protect the computer against virus – What is the Structure of Viruse?

Unit – IV:

Firewalls and Proxy Servers – Kinds of Firewalls: Packet Filters – Application – level Filtering – Circuit – level Gateways – Dynamic Packet Filters – Distributed Firewalls – What Firewalls Cannot Do – Filtering Services: Reasonable Services to Filter – Digging for Worms – Packet Filtering – Implementing policies (Default allow, Default Deny) on proxy.

Unit – V:

Cryptography – Introduction to Basic encryption and Decryption, Diffie – Hellman Key Exchange – Concept of Public key and Private key – Digital Signatures.

Text Book:

1. William R. Cheswick, Steven M. Bellovin and Aviel D. Rubin, “*Firewalls and Internet Security: Repelling the Wily Hacker*”, Second Edition, Pearson Education.

Reference :

1. Speed , “*Internet Security :A Jumpstart For Systems Administrators And IT Managers*”, Elsevier India.
2. Behrouz Forouzan , “*Cryptography And Network Security E/2*”, Tata McGraw Hill Education.

Major Elective Theory : Wireless Application Protocol**Unit – I:**

A Brief History of WAP: Origins – The WAP Forum – Forum Members – Why WAP?: The Great Convergence – WAP Device Characteristics – The Need For WAP – An Overview of WAP: WAP in Action – Web Transaction Model – WAP Transaction Model – WAP Architecture – A Closer Look at WAE.

Unit – II:

The WAP Application Environment: The Microbrowser – WML – WML Features – WMLScript – WAP Client Software, Hardware, and Web Sites: OEM Microbrowsers – Consumer Microbrowsers – WAP Devices – Consumer WAP Sites.

Unit – III:

WAP Gateways: A Note on Terminology – WAP Gateway Services – Security – WAP’s Security – Some WAP Profiles: exo – net – MainFreight – Sky City Hotels – A Consumer Profile – What WAP Does Well – Implementing an Enterprise WAP Strategy – The Future of WAP: Problems with WAP – Solving These Problems – The Next Generation.

Unit – IV:

Document Status – References – Definitions and Abbreviations – WML and URLs – WML Character Set – WML Syntax – Core WML Data Types – Events and Navigation – The State Model.

Unit – V:

The Structure of WML Decks – User Agent Semantics – WML Reference Information – A Compact Binary Representation of WML – Static Conformance Statement.

Text Book:

1. Steve Mann, Scott Sbihli, “*The Wireless Application Protocol*”, Wiley India Pvt. Ltd., New Delhi.

Reference :

1. Dale Bulbrook, “*WAP: A Beginner’s Guide*”, Tata McGraw – Hill Publishing Company Limited, New Delhi.
2. Sandeep Singhal, Thomas Bridgman, Lalitha Suryanarayana, Daniel Mauney, Jari Alvinen, David Bevis, Jim Chan, Stefan Hild, “*WAP– The Wireless Application Protocol, Writing Applications for the Mobile Internet*”, Pearson Education Pte. Ltd., Delhi.

Group B (Major Elective – II)**Major Elective Theory : Human Resources Management.****UNIT – I:**

Human Resources Management –Definition, Concept, Objectives , Characteristics, Functions – Systems Approach to Personal Management – Organisational Structures .

UNIT – II:

Man Power Planning , Job Analysis , Job description , Job Specification , Job Evaluation, Recruitments and Selection Process .

UNIT – III:

Training of Employees , Supervisor and Executives – Promotions – Demotions, Transfer, Absenteeism , Turn over ,Reward and Incentives , Benefits and Employee Services – Performances appraisal.

UNIT – IV:

Industrials Relations – Definition –Significance Causes of poor Industrial Relations Suggestions to improve Industrial Relations – Labour disputes and Industrial Relations in India.

UNIT – V:

Workers Participation in Management , Colective Bargaining and Industrial relation – Employee Grivance Procedures & industrial Disciplinary System.

Text Books:

1. Personal Management: Edwin & Flippo
2. Personal Management: C.B.Mamoria
3. Industrial Relation in India: Charlesmyers
4. Labour Problems in India: Mahindra

Major Elective Theory : Financial Management.**UNIT – I:**

Nature of Financial Management – Objectives. Profit Maximisation Vs. Wealth Maximisation – Function – Financial Decision – Organization of the Finance.

UNIT – II:

Sources of Capital – Types of Securities ,Cost of Capital – Cost of Debt, Cost of Preferred Stock, Cost of Equity, Cost of retained earnings and weighted average Cost of Capital. Capital Structure theories: Net income ,Net operating income, Modigliani – Miller, Traditional.

UNIT – III:

Working Capital Management – Types of Working Capital – Financing Mix : Hedging ,Conservative – Determinants.

Cash Management: Objectives – Cash Budget Cash Management – Strategies. Receivables Management: Objectives –Credit Policy: Credit Terms, Credit Standards And Collection Policy.

UNIT – IV:

Inventory Management – Costs And Benefits of holding Inventory – Classification : ABC Analysis – Order Quantity: EOQ – Order Level : Reorder Point – Minimum Stock , Maximum Stock , Safety Stock.

Capital Budgeting: Importance – Process – Evaluation Methods:Payback Period, Accounting Rate of Return , Net Present Value , Profitability Index And Internal Rate of Return.

UNIT – V:

Divided Decisions: Relevance and Irrelevance of Dividend –Walter's Model, Gordon's Model, M.M.Model – Determinants of Policy – Alternatives Forms of Dividends: Stock Dividend and Stock split . Lease Financing : Types – Leasing Decisions.

Text Books:

1. Financial Management – M.Y.Khan & P.K.Jain (Tata McGraw Hill Publishing Co Ltd.)
2. Financial Management – I.M.Pandey(Vikas Publishing house (P)Ltd).
3. Financial Management – James C. Van Horne(Practice Hall India)

Major Elective Theory : E – Commerce.

Unit – I:

Introduction to E – Commerce – Networks – Transactions – Commercial Transactions – Why use E – Commerce – Internet and other Novelties – Advantages of E – Commerce – Electronic Transactions Today – World Wide Web

Unit – II:

Security Technologies – Why Internet Is Unsecure – Internet Security Holes – Cryptography: Objectives – Codes and Ciphers – Breaking Encryption Schemes – DES – Cryptographic Applications – Digital Signature – Nonrepudiation and Message Integrity

Unit – III:

Traditional Transactions : Updating – Offline and Online Transaction – Secure Web Servers – Required Facilities – Digital Currencies and Payment Schemes – Protocol for the Public Transport – Security Protocols – Credit Card Business Basics.

Unit – IV:

Online Commerce Options – Functions and Features – Payment Systems: Electronic, Digital and Virtual Internet Payment Systems – Account Setup and Costs – Virtual Transaction Process – InfoHaus – Security Considerations.

Unit – V:

CyberCash: Model – Security – Customer Protection – Client Application – Selling through CyberCash – Servers and Commercial Environments – Payment Methods – Server Market Orientation – Netscape Commerce Server – Microsoft Internet – Servers – Smart Cards.

Text Book:

1. Pete Loshin, “Electronic Commerce”, 4th edition, An imprint of Laxmi Publications Pvt Ltd, New Delhi 2004.

Reference Books

1. Jeffrey F. Rayport and Bernard J. Jaworski, “Introduction To E – Commerce”, 2nd ed, Tata Mc – Graw Hill Pvt Ltd, 2003
2. Greenstein, “E – Commerce”, Tata Mc – Graw Hill Pvt Ltd, 2000.

Skilled Based Subject Syllabus

Semester III

Skilled based subjects are practical oriented. One hour should be assigned for tutorial class and three hours of practical to do the given practical list.

Sample should be provided to the students for designing the given list.

Subject : DTP

Page Maker

1. Design of ID card (3''*2'')
2. Design visiting card(3.5''*2'').
3. Design of an attractive invitation card(5.5''*8'')
4. Design letter pad(7.5''*9'').
5. Preparation of a small booklet with 6 pages(3.5''*4.5'').
6. Design a hand bill(5.5''*8.5'')
7. Create a advertisement for your college.
8. Design your college progress card.
9. Create a receipt bill with counter foil.
10. Create a graph/pie chart.

Photoshop

1. Design of a brochure for an institution.
2. Seasonal greeting card.
3. Transporting an image from one background to another.
4. Design a web page poster(1004*750)/textbook cover page.
5. Crop an image/rotate an image.

CorelDRAW

1. Create an object and fill with multiple colours.
2. Design a book cover.
3. Create a frame and enter a paragraph with different formats of text.
4. Export any five image in a single applications.
5. Design page frame by inserting image and objects.

Skilled Based Subject Syllabus Semester V

Skilled based subjects are practical oriented. One hour should be assigned for tutorial class and three hours of practical to do the given practical list.

Sample should be provided to the students for designing the given list.

Subject : Animation Applications.

FLASH

1. Create a simple Presentation.
2. End a movie clip using Script.
3. Start a graphic animation at a specific frame.
4. Text animation using motion tweening.
5. Activate a new window/page using buttons.
6. Bouncing ball with sound effect.
7. Create a scrolling gallery in a page.

DREAMWEAVER

1. Creating a New Dreamweaver Site
2. Adding Images, Text and Links
3. Flash Buttons and Flash Text
4. Create a Rollover Images
5. Creating Tables – FAQs
6. Designing Web Pages with Frames
7. Inserting and Formatting a Table in Standard View
8. Design navigation Bar with Images

NON – MAJOR ELECTIVE PAPERS – I :

Other than B.Sc (IT), B.Sc(CIT) &B.Sc (ISM).

INTRODUCTION TO INFORMATION TECHNOLOGY.

Unit – I:

Information Technology Basics: Introduction , Information, Technology, Information technology, Present Scenario, Role of Information Technology, Information technology and internet, Careers in IT industry. Computer organization and Architecture: Central Processing Unit, Inside a computer, Data representation in Computer, Coding Schemes.

Unit – II:

Computer Memory and Storage Introduction, memory hierarchy, Random Access Memory (RAM) , Read only memory (ROM), RAM, ROM and CPU Interaction, Types of Secondary storage devices, Magnetic tape, magnetic disk, types of magnetic disk, optical disk, type of optical disks.

Unit – III:

Input Output Media: Introduction, types of input devices, types of output devices. Multimedia Essentials: Introduction, Multimedia: Definition, Building blocks of multimedia, multimedia system, multimedia applications, Virtual reality.

Unit – IV:

The Internet : Introduction, Evolution of Internet – Basic Internet terms – Getting connected to Internet – Internet Applications – Data over Internet. Internet tools: Introduction – Web Browser – Browsing Internet using Internet Explorer – E – Mail – Search engines – Instant messaging.

Unit – V:

Emerging trends in IT: Introduction, E – Commerce –Electronic Data Interchange – Mobile Communication – Bluetooth – Global Positioning System – Infrared Communication – Smart Card – Imminent Technologies.

Text Book:

1. Introduction to Computers and Information Technology, D. Glory Ratna Mary, S. Selvanayahi, V. Joseph Peter, Shekina Publications.

Reference Books:

1. Introduction to Information Technology ITL Education Solutions Limited, Pearson Education.
2. Fundamentals of Information Technology By Alexis Leon & Mathews Leon Vikas publication – New Delhi.

NON – MAJOR ELECTIVE PAPERS – II :
Other than B.Sc (IT), B.Sc(CIT) &B.Sc (ISM).

BASIC PROGRAMMING DESIGN

Unit – I :

Introduction – Algorithms, Flowcharts, Types of Programming languages, Selection of Programming languages, Program writing Debugging.

Unit – II :

Flow Charts – Elementary Concepts. – Introduction, Kinds of flow charts, symbols used in flow charts, Advantages of flow charts, examples, constants and variables.

Unit – III :

Flow Charting Simple Computations. – Introduction, illustrating examples, conclusions.

Unit – IV :

Subscripted Variables_– Introduction, basic concepts of subscripted variables, one dimensional array, illustrating examples, conclusions.

Unit – V :

Multidimensional Arrays. – Introductions, definitions, matrix operations, illustrating examples, beyond two dimensions, conclusions. – Introduction To File Structure.

Introduction, Concept of data files, Types of data files, File Organization methods, File processing activities, Conclusions.

Text Book:

1. Basic Programming Design. D.S. Arul Selvan & A. A. Regieson Sylum Shalom Publications, Green St, Nagercoil.

Reference:

1. Insight into Flowcharting. Raj K. Jain. By S. Chand & Company Ltd.

APPENDIX – AZ53**MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI - 12****B.Sc Biotechnology****Restructured Syllabi as per CBCS****Effective from the Academic year 2012-2013**

Eligibility for Admission- A pass with 50% marks in H.Sc with any biological subjects

Distribution of marks in theory between external and internal assessment is 75: 25

and for practicals 60:40

A minimum of 35 % marks is eligible for pass

Semester I :

	Components	Hours	Credits
Part I	Tamil/Other Languages (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	1.Basics of Biodiversity and Biotechnology	4	4
	2. Cell Biology and Genetics	4	4
	Practical 1: Biodiversity and Biotechnological Methods	2	--
	Allied PAPER 1- Biomolecules	6	4
Part - IV	Environmental Studies (1 Course)	2	2
Total	(6 Courses)	30	20

Semester II

	Components	Hours	Credits
Part I	Tamil/Other Languages (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	Instrumentation	4	4
	Molecular Biology	4	4
	Practical 1: Instrumentation And Molecular Biology	2	2
	Allied Paper II - Analytical Biochemistry	6	4
Total	(6 Courses)	30	20

III Semester:

	Components	Hours	Credits
Part I	Tamil/Other Languages (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	Microbiology	4	4
	Practical 1: Microbiology	2	--
	Allied II- biophysics	4	4
	Allied Practical II- biophysics	2	--
Part IV	Skill based Subject (1 Course) Industrial biotechnology (or) Clinical Biochemistry	4	4
	Non – Major Elective (1 Course) Nutritional Biotechnology (or) Vector born diseases	2	2
Total	(6 Courses)	30	20

IV Semester:

	Components	Hours	Credits
Part I	Tamil/Other Languages (1 Course)	6	3
Part II	English (1 Course)	6	3
Part III	Immunology	4	4
	Practical - Immunology	2	2
	Allied Subject II: Bio statistics	4	4
	Allied practicals: Bio statistics	2	2
Part IV	Skill based Subject (1 Course) Floriculture (or) Vermi and Mushroom culture	4	4
	Non – Major Elective (1 Course) 1. Genetic diseases 2. Cancer biology	2	2
Part V	Extension activity		1
Total	(6 Courses)	30	25

V Semester:

	Components	Hours	Credits
Part III	Genetic Engineering	4	4
	Plant biotechnology	4	4
	Practical- genetic Engineering	2	--
	Major Elective - I (1 Course) IPR (or) Clinical Research	4	4
	Major Elective - II (1 Course) Genomics (or) Nano-biotechnology	4	4
Part IV	Skill based Subject (1 Course) Personality Development Effective Communication	4	4
Total	(6 Courses)	30	20

VI SEMESTER

	Components	Hours	Credits
Part III	Animal Biotechnology	4	4
	Stem Cell Technology	4	4
	Bioprocess Technology	4	4
	PRACTICAL - Animal Biotechnology	2	2
	PRACTICAL - Stem Cell Technology	2	2
	PRACTICAL - Bioprocess Technology	2	2
	Project		4
Total	(Courses)		26

III SEMESTER MICROBIOLOGY

Unit I

General Microbiology-History and scope of Microbiology-Sterilization and disinfections-different culture media-Cultivation of Bacteria-Identification of Bacteria-Principle, operation and maintenance of instruments in microbiology

Unit II

Bacterial Anatomy-Structure and Functions of cellular components of bacteria. Physiology of bacteria-Growth and nutrition of bacteria and their requirement. Bacterial metabolism- Respiration, fermentation and photosynthesis.

Unit III

Morphology, cultural characteristics, pathogenicity, Laboratory diagnosis Treatment of Gram Positive organisms and Gram negative organisms. Gram Positive- *Staphylococcus*, *Streptococcus*, *Bacillus*, *Clostridium*. Gram Negative- *Neisseria*, *E.coli*, *Klebsiella*.

Unit IV

Classification and nomenclature of viruses-virology-Morphology of Viruses-Properties of viruses-viral multiplication- Amplification of viruses-Viral Genetics.

Unit V

Mycology-Features, Laboratory of diagnosis of treatment of pathogenic fungi- superficial mycoses-subcutaneous mycoses-Systemic mycoses- opportunistic mycoses. Parasitology- Entamoeba histolytica-Giardia, toxoplasma, Plasmodium- Life cycle, Diagnosis and treatment.

References:

1. General Microbiology, Stanier, R. Y., Ingram, J.L.K., Wheelis, M.L and Painter, P.R, The Macmillan Press Ltd.,
2. Biology of Microorganisms, Brock, Madigan, M.T., Martinko, J.M. and Parker, J. Prentice-Hall.
3. Microbiology, Pelczar, M.J. Jr., Chan, E.C.S. and Kreig, N.R., Tata McGraw Hill
4. Microbial Genetics, Maloy, S.R., Cronan, J.E. Jr. and Freifelder, D. Jones, Bartlett publishers.
5. Chemical Microbiology, An introduction to Microbial Physiology – AH Rose, Butterworth, London.
6. Microbiology – A laboratory Manual, Cappucino, J.G and Sherman, N, Addison Wesley.

PRACTICAL 1: MICROBIOLOGY

1. Preparation of liquid and solid media for growth of microorganisms
2. Isolation and maintenance of organisms by plating, streaking and serial dilution methods. Slants and stab cultures. Storage of microorganisms.
3. Isolation of microorganisms from soil and water
4. Growth; Growth curve; Measurements of bacterial growth by turbidometry and serial dilution methods. Effect of temperature, pH and carbon and nitrogen sources on growth.
5. Microscopic examination of bacteria, *yeast* and molds staining: Gram stain, Acid Fast stain and staining for spores
6. Counting of bacteria using a Hemocytometer.
7. Study of mutations by Ames test
8. Assay of antibiotics and demonstration of antibiotic resistance
9. Analysis of water for portability and determination of MPN
10. Biochemical characterization of selected microbes
11. One step growth curve of coliphage

Allied Paper BIOPHYSICS

UNIT-I

Definition, scope and methods of biophysics - biological individuality, finalism and causality. Physics of atoms and molecules - atomic structure - atomic orbital, wave functions - electronic structure of atoms, spin of particles - relationship between atomic structure and chemical properties. Formation of molecules from atoms: bonds - different types - properties and strength - molecular orbital - molecular chirality in biological systems. Energetics of a living body, sources of heat limits to temperature (qualitative treatment), Heat dissipation to conservation, laws of thermodynamics.

UNIT-II

Absorption spectroscopy - Beer Lambert's law, colorimetry to spectrophotometry (Single and double beam spectrophotometer) - primary biophysical events in photosynthesis. Physical methods for determining size and shape of macromolecules - diffusion to sedimentation - reverse osmosis.

UNIT-III

Spectroscopic techniques for molecular structure (quantitative techniques) - general spectroscopy (UV, visible, fluorescence, atomic absorption, IR to Raman spectra).

UNIT-IV

Physical methods of imaging intact biological structures (X-ray, CAT-Scan, ECG, EEG, NMR) and radioactive pollution

UNIT-V

Structure of proteins - X-ray crystallography - centrifugation, autoradiography - GM Counter -LS counter

Reference

1. Physical Biochemistry, Applications to Biochemistry and Molecular Biology - D, Freifelder.
2. General Biophysics, Vol. I & II - H.V. Volkones.
3. Molecular Biophysics - B. Pullman & M. Voino.
4. Aspects of Biophysics, Hughe S W, John Willy and Sons.
5. Introduction of Biophysics by Pranab Kumar Banargy, S Chand and Co.

PRACTICAL - BIOPHYSICS

1. Determination of PH using PH meter.
2. Sedimentation of Emulsion of oil
3. Agarose Gel Electrophoresis & SDS-PAGE
4. Isolation & Purification of protein (Dialysis)
5. Estimation of protein – Lowry's Method, Bradford Method.
6. Estimation of DNA by DPA method.
7. Estimation of RNA by Orcinol method.
8. ECG and EEG (Demo)

Skilled Based Subject (Anyone)

CLINICAL BIOCHEMISTRY

UNIT-I:

Basic concepts of Clinical Biochemistry: Definition and scope of clinical biochemistry in diagnosis, collection and preservation of biological fluids (blood, serum, plasma, urine & CSF), normal values of important constituents of blood, CSF, urine etc., Biochemical principles of water and electrolyte imbalance, acid base homeostasis, preliminary concept of cardiovascular, liver and kidney disorders including laboratory test for respective markers.

UNIT-II:

Diseases related to carbohydrate metabolism: Regulation of blood sugar, Glycosuria - types of glycosuria. Oral glucose tolerance test in normal and diabetic condition. Diabetes mellitus and Diabetic insipidus - hypoglycemia, hyperglycemia. Ketonuria, ketosis.

UNIT-III:

Inborn errors of metabolism: Introduction - clinical importance, phenyl ketonuria, cystinuria, alkaptonuria, Fanconi's syndrome, galactosemia, albinism, tyrosinemia, and hamophilia.

UNIT-IV:

Organ function test: Lipid and lipoproteins: Classifications, composition, mode of action - Cholesterol. Factors affecting blood cholesterol level. Dyslipoproteinemias, IHD, atherosclerosis, risk factor and fatty liver. Liver function test: Metabolism of bilirubin, jaundice - types, differential diagnosis. Liver function test - Icteric index, Vandenberg test, plasma protein changes, PT. Renal function test: Clearance test – Urea, Creatinine, Inulin, PAH test, Concentration and dilution test. Gastric function test: Collection of gastric contents, examination of gastric residuum, FTM, stimulation test, tubeless gastric analysis.

UNIT-V:

Clinical enzymology: Functional and non- Functional plasma enzymes. Isoenzymes with examples. Enzyme patterns in acute pancreatitis, liver damage, bone disorder, myocardial infarction and muscle wasting.

References

1. Text book of Clinical Biochemistry - Carl A. Burdis and Edward R Ashwood
2. Text book of Medical Biochemistry - Dr. M.N. Chatterjee and rane shinde
3. Clinical chemistry in diagnosis and treatment - Philip D. Mayne
4. Clinical chemistry – William Hoffman
5. Clinical Biochemistry with clinical correlation – Devin, Wiley
6. Practical clinical biochemistry – Harold Varley, CBS, New Delhi

INDUSTRIAL BIOTECHNOLOGY

UNIT-I

Introduction to biotechnology and products. Major classes of commercial products using micro organisms-enzymes, amino acids, vitamins, antibiotics, organic solvents, organic acids, food and beverages.

UNIT-II

Industrially important microorganisms: screening techniques - detection & assay of fermentation products-strain improvements - mutations, protoplast fusion and rDNA techniques for strain development.

UNIT-III

Bioreactors / Fermentor: Types, features, operation: sterilization (Batch and Continuous), inoculation and sampling. Control of bioprocess parameters. Microbial growth and media formulation. Microbial culture - batch, fed batch, semi-continuous, continuous. Growth kinetics of microorganisms.

UNIT-IV

Down stream processing: Solid-liquid separation, flotation, flocculation, filtration, centrifugation, cell disruption, concentration, evaporation, liquid-liquid extraction, membrane filtration, precipitation, adsorption. Product purification by chromatography.

UNIT-V

Industrial process of beverages - enzymes - amino acid - organic acids - organic solvents - antibiotics. Introduction to nanotechnology - history and recent developments - sources of nanoparticles - microbial production of nanoparticles - advantages of microbial nanoparticles - applications.

References

1. Manual of industrial microbiology and Biotechnology, Demain A.L. Solomon, J.J., 1986. ASM press.
2. Industrial Microbiology, Reed C., Prescott and Dann's, 1982. Macmillan publishers.
3. Fundamentals of Biotechnology, Prave. P. Faust, V. Sitih. W., Sukatsh, DA, 1987. ASM press.
4. Biotechnology, Satyanarayana, U., 2006. Books and Allied (P) Ltd.
5. AN introduction to Genetic Engineering, Desmond, S.T., Nicholl, 1994. Cambridge press.
6. Principles of Gene Manipulation. 4th edition, Old R.W. and S.B. Primrose, 1994. Blackwell scientific publication London.
7. Fundamentals of Biotechnology, P.Prave, P.Faust, V. Sittig, word sukatasch D., 1987. VCH verlasgetell Schafor MBH, Weinhkeim.

Non Major Elective paper (Anyone)

Nutritional Biotechnology

Unit I:

CARBOHYDRATES: Glycolysis, Citric acid cycle, Electron transport chain (brief idea), glycogenesis, glycogenolysis, gluconeogenesis.HMP Shunt. LIPID: Beta-Oxidation, (alpha and omega oxidation-definition only), Synthesis & utilization of ketone bodies, Ketosis, Causes of fatty liver.

Unit II:

PROTEIN: Tertiary & Quartinary structures of protein with Haemoglobin & Collagen as examples, Deamination & Transamination, amino acid metabolism. ENZYMES: Definition & Classification, Kinetics (Gibbs free energy change, Reaction initiation energy), Michalies-Menten equation, Reciprocal plot & its significance, Vmax & Km, substrate specificity, enzyme inhibition (irreversible- Penicillin inhibition, reversible explained from Reciprocal plot, allotter-ribonucleotide reductase inhibition by nucleotides), isozymes-ex. LDH. COENZYMES: Definition, Biochemical Functions of: NAD, NADP, FAD, CoA, Tetrahydrofolate, TPP. Names of the Vitamines present in those coenzymes

Unit III:

NUCLEIC ACID : Structure of Purines & Pyrimidines, Nucleosides & Nucleotides, Formation of Nucleic Acid Chain from Nucleotides, Importance of Thymine in DNA structure, Types of RNA & their functions (in brief), Structure of t-RNA, Codons, Definition of Central Dogma(Replication, Transcription, Translation - elementary idea only) & Machineries needed in each step(only names of the enzymes and coenzymes).

Unit IV:

VITAMINES: Structure & Biochemical roles, Deficiency disorders of Vitamin A, D, E, K, B₁, B₂, B₆, Folic acid, Pantothenic acid, Niacin & Vitamin C.

Unit V:

MINERALS: Biochemical functions of Na, K, Ca, P, I, Fe, Se - Disorders related to Hyperactivity & Deficiencies of those elements. Diseases related to nutritional deficiency – carbohydrate, lipid, proteins, Vitamins and minerals

References

1. Nutritional Biochemistry – MS Swaminathan
2. Nutritional Biochemistry, 2nd edition, Tom Brody, Academic Press
3. Nutrition- An integrated approach, 3rd edition, Ruth L. Pike and Myrtle L. Brown

VECTOR BORNE DISEASES**Unit I:**

Introduction to general entomology, insect morphology and classification Insects and other arthropods of medical importance and their structures and functions. Methods for collecting these insects and arthropods, their preservation/ maintenance and transportation.

Unit II:

Biology and ecology of mosquitoes: Biology and life history of Aedes, Culex and Anopheles, their behavior and ecology with special reference to dengue, chikungunya, Japanese encephalitis and West Nile. Biology and ecology of other blood sucking insects, Ticks and mites, Biology, morphology and disease relationship of sandflies (sandfly fever and chandipura). Biology and morphology of fleas, lice, culicoides. Biology, ecology, life history of ticks with special reference to Kyasanur Forest Disease (KFD). Biology and morphology of mites.

Unit III:

Communicable & infective disease control: definitions related to communicable diseases. Infection, contamination, decontamination, disinfection, transmission (direct & indirect)

Unit IV:

Vector borne diseases: A brief account of insect vectors affecting the health of man and domestic animals. Epidemiology and control of vectors and vector-borne diseases like dengue, plague, malaria, filariasis, tuberculosis, MMR, chicken pox, pertussis, chikungunya and mite-borne diseases, etc.

Unit V:

Various control strategies and environmental management. Control in urban settings Control at aquatic stages, adult population, personal protection, insecticide resistance mechanism and control dynamics.

References

1. Gordon RM, Lavoipierre MMJ (1962) Entomology for students of Medicine. Blackwell Scientific Publ.
2. Service MW (1996) Medical entomology for students. Chapman and Hall
3. Kettle DS (1984) Medical and veterinary entomology CAB international
4. Richard and Davies Imm's general Text book of Entomology, Vol I & II. Chapman and Hall
5. Roy DN and Brown AWA (1970) Entomology (Medical & veterinary) Bangalore printing and Publishing co.
6. Bates M (1949) Natural History of mosquitoes The Macmillan Co
7. Baker RH and Wharton R(1952) Introduction to Acarology The Macmillan Co

SEMESTER IV

IMMUNOLOGY

UNIT-I

Immune system- Definition and properties. Lymphoid organs-primary and secondary; structure and functions. Types of Immunity- Innate and acquired, humoral immunity and cell-mediated immunity. Antigen: definition, properties-antigenicity and immunogenicity, antigenic determinants and haptens. Types of antigens.

UNIT –II

Immunoglobins; structure, classes and distribution of antibodies. Theories of antibody formation. Antigen - antibody interactions; strength of antigen - antibody interactions, cross reactivity, precipitation reactions and agglutination reactions. Organization and expression of Immunoglobulin genes - generation of antibody diversity. Complement system – alternate and classical pathways, initiators and MAC.

UNIT-III

Mechanism of antigen recognition by T and B - lymphocytes. Major histocompatibility complex (MHC) - General organization and inheritance of the MHC, MHC molecules and genes - cellular distribution and regulation of MHC molecules. Antigen processing and presentation - role of antigen - presenting cells. Primary and Secondary immune response. Cell immunity - components of T lymphocytes and CD molecules, Regulation of immune response, cytokines, types, role in immunity.

UNIT-IV

Immunoregulation - helper and suppressor cells, mechanism in immunity. Antigen recognition - T and B cell receptors. Inflammation - mechanism and significance. Transplantation immunology - graft rejection and HLA antigens. Role of MHC and T cells. Prevention of graft rejection. Hypersensitivity -immediate and delayed types; mechanism and reactions. Vaccines - types production and uses. Immunity to virus, bacteria and parasites - Genetic control of Immune response. Immunosuppression.

UNIT-V

Immunological Techniques: Immunological principles of various reactions and techniques: Affinity and avidity, cross reactivity, precipitation, agglutination, Widal, VDRL, Pregnancy and Rheumatoid factor tests. Principle and applications of RIA, ELISA, FISH and Westernblot. Precipitation reaction immunodiffusion, immunoelectrophoresis, ELISA (indirect, sandwich, competitive, chemiluminescence, ELISPOT assay), western blotting, immunofluorescence, flow cytometry and fluorescence, and immunoelectron microscopy. Monoclonal antibodies, Polyclonal antibodies

REFERENCE

1. Ivan, M. Roit, Jonathan and Brostoff and David Male (1998): Immunology-5th Edition. (Churchil Livingstone Publishers)
2. Janis Kuby (1998) : Immunology - 3rd and 4th Edition(W.H. Freeman)
3. Weir,D.N (1997): Immunology (8th edition, Churchil Livingstone Publishers)
4. Nandini Shetti : Immunology Introductory Text Books
5. Gladvin and Trattler : Clinical Microbiology
6. Male et al : Advanced Immunology
7. Essential Immunology by Roit, I. Blackwell Science, Oxford
8. Text Book of Immunology by Barrett. The C.V. Masby Company, St. Louis
9. Immunology by Tizard. Saunders College Publishing, Philadelphia
10. The Experimental Foundations of Modern Immunology by W. Clark. John wiley and Sons, New York
11. Cellular and Molecular Immunology by Abbas, Lichtman and Pober, W.B. Saunders Company, Philadelphia

PRACTICALS - IMMUNOLOGY

1. Identification of human blood groups – A, B, AB, O and Rh factor.
2. To perform total leucocyte count on the given blood sample
3. To perform differential leucocyte count of the blood sample.
4. To separate serum from the blood sample.
5. To perform immunodiffusion by Ouchterlony method.
6. To perform immunoelectrophoresis with a given antigen-antibody system.
7. To perform DOT ELISA.

BIOSTATISTICS

UNIT-I

Definition - Nature and Scope of bio statistical methods and their limitations-Collection, Classification, Tabulation of Statistical data - uses of frequency table -Diagrammatic and Graphical Representation of Statistical data.

UNIT-II

Measure of Central Tendency-Mean, Median, Mode, and their Merits and Demerits. mode - calculation of mean, median and mode in series of individual observation, discrete series continuous open - end classes.

UNIT III

Measure of Dispersion - Range, Mean Deviation, Quartile Deviation, Standard Deviation, Co-Efficient of Variation - Skewness - Karl Pearson's and Bowley's Coefficient of Skewness.

UNIT IV

Events and Sets - Sample Space - Concept of Probability - Addition and Multiplication Theorem on Probability - Conditional Probability - Independence of Events.

UNIT-V

Bivariate Frequency Table and its Uses - Correlation Analysis-Scatter diagram - Karl Pearson's Correlation Coefficient - Spearman's Rank Correlation - Regression Analysis - Regression lines - Fitting of Straight line using Method of Least Squares.

Reference

1. Sunder Rao - Bio statistics.
2. Zar. J-Bio statistical analysis, Prentice Hall of India.
3. S. C. Gupta of V.K.Kapoor - Fundamental of Mathematical Statistics, Sultan & Sons.
4. Scholes, W.L-Statistics for bio logical sciences, Addison Wesley.
5. S. P. Gupta - Statistical Methods, Sultan Chand & Sons
6. Lewis, A .E (1971)-Bio-Statistics
7. Daniel : Bio-Statistics, John Wiley & Sons

Bio statistics Practicals

1. Construction of univariate distribution with sample size not exceeding 200. Diagrammatic & statistical representation of data
2. Numerical computation of measures of central tendency. Measures of Dispersion (relative and absolute) - Measures of Skewness.
3. Fitting of Binomial and Poisson distributions and testing of goodness of fit.
4. Computations of correlation coefficients - regression lines - rank correlation coefficients.
5. Asymptotic and exact test based on Normal, t and F distributions.
6. Chi-square test for independence of attributes and its applications to biological studies.
7. Analysis of variance - One-Way and two-way classifications.
8. Analysis of CRD, RBD and LSD.
9. Non-parametric test

FLORICULTURE

Unit I:

Avenues and scope of floriculture, emerging trends in floriculture biotechnology, Floriculture in the era of WTO, National and International status of floriculture industry.

Unit II:

Cultivation of floriculture crops: Anthurium, Bird of Paradise, Carnation, Chrysanthemum , Gladiolus, Gloriosa, Iris, Jasmine, Lily, marigold, Orchids, Rose, Tulip. Nutritional aspects of Floricultural crops.

Unit III:

Package of Practices for management of Pest and disease for floricultural crops, Role of Green House in improving the quality and productivity of floricultural plants. Eco-Friendly cultivation of floricultural crops, Compatibility for Inter cropping of floricultural crops with other agricultural crops,

Unit IV:

Research and Development in Floriculture: Modern floriculture Industries. Improvement of aesthetic values, Genetic Improvement programmes through biotechnological approaches, Production of F1 hybrids, rapid propagation methods. Role of Tissue Culture in Floriculture Industry.

Unit V:

Floriculture Industries (National and International Status). Harvesting, Packing, Marketing, Revenues, Avenues for employments in Floriculture Industries, Socioeconomical aspects of floricultural industry, Sustainability.

References: Floriculture: Technology, Trades and Trends by Prakash J and Bhandary K.R. New Dlehi, Oxford and IBH Publication

VERMI AND MUSHROOM CULTURE

UNIT-I:

Vermicomposting - Definition, introduction and scope: Ecological classification: Humus feeders, Humus formers, leaf mold, top soil and sub soil types. Physical, chemical and biological changes brought by earth worm in soil - burrows - drilosphere - earthworm casts.

UNIT-II:

Optimal conditions for Vermiculture - temperature, moisture, pH, soil type, organic matter, protection from sunlight, rain, predators - food preference. Basic components for vermiculture - Culture practices - Home - School - Industries - Vermi wash.

UNIT-III

Composting - Vermicomposting - Required conditions - Methods - Advantages - Cost-Benefit analysis of Vermicomposting.

UNIT-IV:

Introduction and Importance of mushrooms; History of Mushroom's cultivation; Present status of mushroom industry in India; Cultivable edible mushroom; Biology of mushroom; food value of edible mushrooms; Uses of mushrooms, Poisonous mushrooms, and Medicinal mushrooms.

UNIT-V:

Mushrooms farm structure; design and layout; Spawn principles and techniques of spawn production; Principle and techniques of compost and compositing; Cultivation techniques of White button mushroom, oyster mushroom; Management of fungal, bacterial and viral diseases in mushroom; Competitors, pests and nematodes in mushrooms; Post harvesting techniques and Economics of mushroom cultivation.

REFERENCES:

1. Sultan Ahmed Ismail, 2005, The Earthworm Book, Second Revised Edition. Mother India Press, Goa.
2. Edwards, C.A. and Bohlen, P.J 1996, ecology of earthworms - 3rd Edition, Chapman and hall.
3. Jsmail, S.A., 1970, Vermicology, The biology of earth worms, Orient Longman, London.
4. Lee, K.E., 1985. Earthworms - Their ecology and Relationship with Soil and Land use, Academic Press, Sydney.

Non Major Elective (anyone Paper)

Genetic Diseases

Unit 1:

The origin of medical genetics, classification of genetic diseases - definition and impact of genetic diseases. Human Chromosomes: Structure and organization of DNA; Normal human karyotype: Paris Nomenclature; Chromosomal aberration: Numerical: Aneuploidy, Polyploidy (eg: Turner, Down & Klinefelter Syndromes). Structural: Translocation, Duplication, Inversion, Ring Chromosome and Deletion (Eg: Cri-du-chat syndrome). Others: Mosaic, Chimera [Individual with two cell lines] Chromosome disorder - Incidence of chromosome abnormalities, disorder of autosomes and sex chromosome, Chromosome breakage Syndromes.

Unit 2:

Metabolic disorders and inherited disease: diabetes, hypertension, Alzheimer's diseases, Duchenne's muscular dystrophy, Huntington's Cholera, Parkinson's disease, Urolithiasis, schizophrenia, hemophilia, sickle cell anemia.

Unit 3:

Liposomes, Drug targeting, lectins, interferons, vaccines, combination therapy, antifertility drugs, antiviral drugs, anticancer agents, anti-inflammatory drugs, diagnostic kits and probes. Radio-therapy, chemotherapy and immunotherapy.

Unit 4:

DNA integrity: Important of maintenance of genomic integrity. Carcinogenesis and mutation. Proteins connected with genomic integrity. Organization of chromatin, Telomere biology. Tumor suppressors Oncogene, the cancer stem cell theory and cell signaling. Phenotype of cancerous cells: aneuploidy, abnormal centrosome, loss of cell cycle arrest. Metastasis

Unit 5:

Genetic model organisms and their significance. (*E.coli*, *Arabidopsis thaliana*, *Coenorhabditis elegans*.)
Diagnosis of Genetic diseases and Genetic counseling : prenatal diagnosis techniques, treatment, methods for tracking disease genes, diagnosis of genetic disorders. - Genetic Counseling.

REFERENCES:

1. Cell and Molecular Biology – Robertis *et al.* Waverly publication, edition 8, 1995.
2. Genetics – Strickberger, M.W. Printice hall, edition 4, 1997.
3. Molecular Biology of the Cell – Alberts. Garland publication, edition 4, 2002.
4. Text Book of Cell and Molecular Biology – Ajay Paul. Books and Allied (P) Ltd, edition 2, 2007.
 5. Principles of Genetics – E.J. Gardener, M.J. Simmons and D.P. Snustad, John Wiley & Sons Publications.
 6. The science of Genetics by Alan G. Atherly, Jack. R, Girton, Jhon. F, Mc Donald. Sounders college publishers.
 7. Genes VII by Benjamin Lewin
 8. Hartl. D.L. A primer of population genetics. III edition, Sinauer associates inc. Sunderland, 2000
 9. Molecular cell Biology, Darnell, Lodish, Baltimore, Scientific American Books, Inc., 1994.
 10. Molecular and cellular Biology, Stephen L. Wolfe, Wadsworth Publishing Company, 1993.
 11. Human genetics, A. Gardner, R.T. Howell and T. Davies, Published by Vinod Vasishtha for Viva Books private limited, 2008.

CANCER BIOLOGY

UNIT I

FUNDAMENTALS OF CANCER BIOLOGY Regulation of cell cycle, mutations that cause changes in signal molecules, effects on receptor, signal switches, tumour suppressor genes, modulation of cell cycle in cancer, different forms of cancers, diet and cancer. Cancer screening and early detection, Detection using biochemical assays, tumor markers, molecular tools for early diagnosis of cancer.

UNIT II

PRINCIPLES OF CARCINOGENESIS Theory of carcinogenesis, Chemical carcinogenesis, metabolism of carcinogenesis, principles of physical carcinogenesis, x-ray radiation-mechanisms of radiation carcinogenesis.

UNIT III

PRINCIPLES OF MOLECULAR CELL BIOLOGY OF CANCER Signal targets and cancer, activation of kinases; Oncogenes, identification of oncogenes, retroviruses and oncogenes, detection of oncogenes. Oncogenes/proto oncogene activity. Growth factors related to transformation. Telomerases.

UNIT IV

PRINCIPLES OF CANCER METASTASIS Clinical significances of invasion, heterogeneity of metastatic phenotype, metastatic cascade, basement membrane disruption, three step theory of invasion, proteinases and tumour cell invasion.

UNIT V

NEW MOLECULES FOR CANCER THERAPY, Different forms of therapy, chemotherapy, radiation therapy, detection of cancers, prediction of aggressiveness of cancer, advances in cancer detection. Use of signal targets towards therapy of cancer; Gene therapy.

REFERENCE

1. Maly B.W.J, "Virology A Practical Approach", IRL Press, Oxford, 1987.
2. Dunmock N.J and Primrose S.B., "Introduction to Modern Virology", Blackwell Scientific Publications, Oxford, 1988.
3. "An Introduction Top Cellular And Molecular Biology of Cancer", j Oxford Medical Publications, 1991.

SEMESTER V
GENETIC ENGINEERING

UNIT I

History and Scope of genetic engineering. Restriction enzymes, Ligases, Alkaline phosphatase, Polynucleotide kinase, Terminal nucleotidyl transferase, DNA Polymerases, Taq DNA polymerases, RNase, Reverse transcriptase. Linkers, Adaptors, Oligonucleotide primers & Homopolymer tailing.

UNIT II

Gene cloning vectors- Plasmids, Construction of pBR322, Bacteriophages vectors, phagemids, cosmids, Yeast vectors and Expression vectors in Prokaryotic and Eukaryotic. Cloning strategies- Gene Library construction, Screening of gene library.

UNIT III

Analyzing DNA and Protein Sequences, Polymerase chain reaction, inverse PCR, RT-PCR, Changing genes- Site-directed mutagenesis, Phage Display, Nucleic acid microarray arrays. Northern blot. Uses of online tools- Web cutters & Vector NTI, SAGE (Serial Analysis of Gene Expression).

UNIT IV

Expression strategies for heterologous genes- expression in bacteria, yeast, insects and insect cell lines, mammalian cell lines and in plants. Processing of recombinant proteins-Purification and refolding, characterization of recombinant proteins, stabilization of proteins.

UNIT V

Transposon tagging- Role of gene tagging in gene analysis. Transgenic animals(Mice, Cattle, Fish), Transgenic plants(Herbicide tolerance, Delayed ripening) Antisense RNA technology, Human GeneTherapy.

References:

1. Mickloss D.A and G.A.Greyer (1990) DNA Science - A First Course in Recombinant Technology, Cold Spring Harbor Laboratory Press, New York.
2. Primrose, S.B (1994) Molecular biotechnology (2nd Edi). Blackwell Scientific Publishers, Oxford.
3. Davis J.A. and W.S.Roznikolf (1992) Milestones in Biotechnology. Classic papers on genetic Engineering, Butterworth-Helnemann, Boston.
4. Walker M.R. and R.Repley (1997) Route Maps in Gene Technology Blackwell Science Ltd., Oxford.
5. Kingsman S.M. and A.J.Kingsman, (1998) Genetic Engineering. An Introduction to gene analysis and exploitation in eukaryotes. Blackwell Scientific Publications, Oxford.
6. James D. Watson. Recombinant DNA (2001). Scientific American Books. USA
7. Glick, B Pasternak, J.J (2007) Molecular Biotechnology. ASM Press, Washington.
8. Benjamin Lewin. Genes-VIII. Oxford University Press.
9. Glover, D.M and B.D Hames. DNA cloning 1-4(2006) Oxford University Press.
10. Mark Schena (2002) Microarray Analysis. 1st Edition. John Wiley & Sons Ltd.

PLANT BIOTECHNOLOGY

UNIT I

Plant tissue culture: a historic perspective. Laboratory organization - sterilization techniques – Media preparation –Types of media – MS media, Nitsh media, Gamborgs media – Plant growth regulators.

UNIT II

The concept of totipotency of cells. Plant tissue culture-principles, callus culture, organogenesis. Plant micro propagation – micro grafting – advantages – virus elimination and shoot tip cultures. Role of tissue culture in agriculture, forestry. Edible vaccines from plants.

UNIT III

Production of haploid plant, virus – free plants. Embryo culture. Isolation, culture and fusion of plant protoplasts. Clonal propagation, somaclonal variation. Valuable chemicals from plant tissue culture. Somatic embryogenesis, *In vitro* pollination and fertilization. Secondary metabolites, biotransformation and metabolic engineering, Plant genome project – Arabidopsis, Cryopreservation and germplasm conservation.

UNIT IV

Plant genome organization, gene silencing in crop plants, gene transfer methods. Role of RFLP in Plant breeding, current status of plant transformation technologies. Production of therapeutic antibodies in plants.

UNIT V

Genetic engineering of crop plant for insect resistance, fungus resistance, virus resistance, drought, cold and saline resistance. Molecular biology of plant pathogen interactions. Transposable elements. Procedures involved in commercialization of transgenic crops. Plant tissue culture in agriculture, horticulture and silviculture. Policy and technological options to deal with India's food surpluses and shortages.

References:

1. J.Hammond, P.McGarvey and V.Yusibov(Eds.): Plant Biotechnology. Springer verlag, 2000.
2. T-J.Fu, G.Singh and W.R.Curtis (Eds): Plant Cell and Tissue Cukture for the Production of Food ingredients. Kluwer Academic/Plenum Press.1999.
3. H.S. Chawla: Biotechnology in crop improvement. International Book distributing Company,1998.
4. R.J. Henry: Practical Application of plant Molecular biology. Chapman and hall.1997.
5. P.K. Guptha: Elements of Biotechnology. Rastogi and Co. Meerut,1996.
6. U. Satyanarayanan. Biotechnology, Books and allied (p) Ltd., 2005.
7. S.S. Bhojwani and M.K.razdan, Tissue Culture Theory and Practice, 2004.
8. Paul Christou and Harry Klee (2004) Hand Book of Plant Biotechnology. Vol.I & II. John Wiley & Sons.

GENETIC ENGINEERING PRACTICALS

1. Isolation of RNA from yeast.
2. Estimation of RNA
3. Isolation of DNA from microbial, plant and animal sources.
4. Estimation of DNA using diphenylamine reagent and by UV spectrophotometry.
5. Enzyme induction in E.Coli.
6. Isolation of plasmid DNA.
7. Digestion of plasmid DNA with restriction endonucleases.
8. Separation of DNA fragments by Agarose gel electrophoresis.
9. Elution of DNA from agarose gels.

10. Ligation of DNA fragments.
11. Bacterial transformation and identification of transformants.
12. Cloning of green fluorescent protein.
13. Gene expression in bacteria.
14. Amplification of DNA by PCR.
15. Southern blotting technique.
16. RFLP and RAPD mapping.

Major – Elective I

INTELLECTUAL PROPERTY RIGHTS (IPR)

UNIT I

Introduction – Invention and Creativity – Intellectual Property (IP) – Importance – Protection of IPR. Why IPR is necessary, TRIPS & IPR, IPR – national & international scenario, IPR protection of life forms. Patents of biotechnology in India

UNIT II

IP – Patents – Copyrights and related rights – Trade Marks and rights arising from Trademark registration – Definitions – Industrial Designs and Integrated circuits –Protection of Geographical Indications at national and International levels – Application Procedures.

UNIT III

International convention relating to Intellectual Property – Establishment of WIPO –Mission and Activities – History – General Agreement on Trade and Tariff (GATT).

UNIT IV

Indian Position Vs WTO and Strategies – Indian IPR legislations – commitments to WTO Patent Ordinance and the Bill – Draft of a national Intellectual Property Policy – Present against unfair competition.

UNIT V

Case Studies on – Patents (Basumati rice, turmeric, Neem, etc.) – Copyright and related rights – Trade Marks – Industrial design and Integrated circuits – Geographic indications –Protection against unfair competition.

REFERENCES:

1. Subbaram N.R. “Handbook of Indian Patent Law and Practice “, S. Viswanathan Printers and Publishers Pvt. Ltd., 1998.
2. Eli Whitney, United States Patent Number: 72X, Cotton Gin, March 14, 1794.
3. Intellectual Property Today: Volume 8, No. 5, May 2001, [www.iptoday.com].
4. Using the Internet for non-patent prior art searches, Derwent IP Matters, July 2000. www.ipmatters.net/features/000707_gibbs.html.

CLINICAL RESEARCH

Unit I

Introduction to Drug Discovery and drug Development, Basic pharmacology and clinical research: Basic conceptual knowledge about receptors, drugs, preclinical studies, pharmacodynamic, pharmacokinetic (ADME), drug interactions, clinical research, Introduction to pharmacoeconomics.

Unit II

New drug discovery process- purpose, main steps involved in new drug discovery process, timelines of each steps, advantages and purposes of each steps, ethics in clinical research, unethical trials, thalidomide tragedy, Phase-I, II, III, IV trials.

Unit III

Introduction and designing, Various phases of clinical trials -Post Marketing surveillance – methods - Principles of sampling -Inclusion and exclusion criteria -Methods of allocation and randomization - Informed consent process in brief-Monitoring treatment outcome -Termination of trial -Safety monitoring in clinical trials

Unit IV

Pre clinical toxicology: General principles, Systemic toxicology (Single dose and repeat dose toxicity studies), Carcinogenicity, Mutagenicity, Teratogenicity, Reproductive toxicity, Local toxicity, Genotoxicity, animal toxicity requirements.

Unit V

Basic terminology used in clinical research: Types of clinical trials, single blinding, double blinding, open access, randomized trials and their examples, interventional study, ethics committee and its members, cross over design, etc...and Institution Ethics Committee / Independent Ethics Committee, Data Management in clinical Research

REFERENCES:

- (1) Basic and Clinical Pharmacology, Prentice hall, International, Katzung, B.G.
- (2) Clinical Pharmacology, Scientific book agency, Laurence, DR and Bennet PN.
- (3) Clinical pharmacokinetics, Pub. Springer Verlag, Dr. D.R Krishna, V. Klotz
- (4) Remington Pharmaceutical Sciences, Lippincott, Williams and Wilkins
- (5) Drug interaction, Kven Stockley. Hamsten
- (6) Drug interaction, Basic Bussiness Publ, Bombay, J.K. Mehra
- (7) Clinical pharmacology and drug therapy Grahame smith and Aronson,
- (8) Text Book of Therapeutics Drug and Disease Management Hardbound. Richard A Helms,
- (9) Clinical Pharmacy and therapeutics Herfindal E T and Hirschman JL, Williams and Wilkins

Major Elective - II
GENOMICS

UNIT - I

Genome - overview of genome; sequence of genome acquisition and Analysis - homologies - snps - genetic analysis, linkage mapping, high Resolution chromosome mapping and analysis - physical mapping, YAC, Hybrid mapping, strategies, sequence specific tags (SST), sequence tagged Sites(STS), ISH, FISH, RFLP, RAPD.

UNIT - II

DNA sequencing - methods, maxam and gilbert method, ladder, Flourescent, shot gun, mass spectrometry, automation dequencing – find Gene mutations, implications of DNA - sequencing and sequening genomes.

UNIT - III

Genome data bank, metabolic pathway data - construction and screening of cDNA, libraries and microarrays - Application of DNA arrays - PCR -Variations in PCR - gene distruptions - Sage and Sade, pharmacogenomics.

Unit - IV

Protein sequence analysis - introduction - sequence data banks - WBRF – PIR - SWISSPORT - databases, data mining - algorithms of proteomics and its Applications - protein expression profiling - protein - protein interaction - protein modifications. Automation - nucleic acid data bank – EMBL Nucleotide sequence data bank - AIDS virus sequence data bank - RNA data Bank.

UNIT - V

Tools for data bank - pairwise alignment - needleman and wusch algorighm - smith waterman - multiple alignment - CLUSTRAL - PRAS - BLAST - FAST, algorithms to analyse sequence data - pdb, cambridge structure data base (lsd), 2d electrophoresis, IEF, HPLC, protein digestion technique, mass spectrometry, MALDI, TOF, peptides, mass finger printing.

NANOBIOTECHNOLOGY

UNIT I

Overview of Nanotechnology : definition, history the new technological revolution, industrial and economic impact. Biosystems, biological networks, biological neurons, neurotransmitters. Protein interactions modulated by chemical energy:- actin, myosin and molecular motors. Bionanoparticles – nanocomposites, nanoparticles.

UNIT II

Introduction - Types of biomaterials. Biodegradable polymers. Biodegradation of solid polymers. Modes of erosion (surface & bulk). Molecular effects on hydrolytic breakdown.

UNIT III

Techniques to construct nanostructures – scanning probe instruments, nanoscale lithography. Techniques to predict nanostructures – TEM, SEM, AFM. Characterization techniques – NMR, Mass (MALDI-TOF) spectroscopy, x-ray diffraction.

UNIT IV

Biomedical sensors and biosensors-. Biosensors – definition and classification – potential based sensors; electrochemical sensors; acoustic/mechanical sensors; thermal and phase transition sensors; sensors in modern medicine- Biomembrane based sensors. Diagnostic imaging techniques (digital imaging; molecular imaging).

UNIT V

Drug delivery systems – polymer therapeutics:- polymer drug conjugates; polymeric micelles; liposomes. Mechanical testing; elasticity; toughness; effect of fabrication on strength. Application of nano materials in medicine: cardiovascular medical devices; tissue regeneration (tissue engineering). Dendrimers as nanoparticulate drug carriers.

References:

1. Molecular Design and Synthesis of Biomaterials Biological Engineering Division, MIT Open Course Ware, 27th May 2005.
2. Biomaterials Sciences: An Introduction to Materials in Medicine 2nd Edition, Buddy D.Ratner, Allan S. Hoffman, Frederick J. Schoen and Jack E. Lemons
3. Nanotechnology: A Gentle Introduction to the Next Big Idea Mark Ratner and Daniel Ratner. Pearson Education Publishers, 2002.
4. Encyclopedia of Nanoscience & Nanotechnology, H.S. Nalwa (Ed.), American Scientific Publishers, California, 2004.
5. Lehninger's Principles of Biochemistry, 4th Edition, David L. Nelson and Michael M. Cox, 2006.
6. Nano biotechnology : concepts, applications and perspectives. Christof M. Niemayer, Chad A. Mirkin, Wiley VCH publishers 2004.
7. Bionanotechnology: Lessons from Nature, David .S. Goodsell, John Wiley 2006.

VI Semester**ANIMAL BIOTECHNOLOGY****UNIT-I**

Introduction to animal biotechnology. Animal cell: production and culture of animal cells Development and maintenance of cell lines, continuous cell lines, culture media, preparation of various culture media and sterilization, storage. Suspension culture, Embryo culture, Teratogenesis, Teratomas. Cell culture in laboratory: large scale culture, applications of animal cell culture.

UNIT-II

Genetic engineering in animals – transformation of animal cells, cloning vectors and expression vectors and animal viral vectors. Transgenic animals – improving important genes, production of recombinant proteins, immunotoxins, vaccines, Hybridoma and monoclonal antibody production. Molecular and cellular biology of fertilization.

UNIT-III

Integrated Pest Management – pest management using juvenile hormone analogues. Pheromones and genetic manipulations – Silk worm and Fish as bioreactors. Baculo viruses in biocontrol and foreign gene expression. Therapeutic and Reproductive cloning.

UNIT-IV

Biotechnology in aquaculture (Ploidy induction, Gynogenesis, Androgenesis and Transgenic fishes); Animal husbandry (In vitro fertilization, Gamete selection, Embryonic sex selection, Embryo manipulation, Demi embryos and Embryo transfer); Animal cloning; Cryobiology. Stem cell – Isolation, culture and its applications

UNIT-V

Mammalian Embryo fusion – Allopheny. Use of nucleic acid probes and antibodies in clinical diagnosis and tissue typing. Mapping of human genome. Role of RFLP, DNA finger printing and PCR in Forensic science. Gene therapy: types and their applications. Social, Ethical and legal issues in Animal Biotechnology (Human cloning, Foeticide, Sex determination).

REFERENCE

1. Spier, R.E. and Griffiths, J.B., 1988, Animal Cell Biotechnology, Academic Press, New York.
2. Butler, M., 1987. Animal Cell Technology, Principles and Products, Open University Press, New York.
3. Strachan, T. and Read, A.P., 1999. Human Molecular Genetics, John Wiley & Sons, Pvt. Ltd., Singapore.
4. Anon, 1988. Animal Cell Biotechnology, Academic Press, New York.
5. Biotol Series, 1992. In vitro cultivation of Animal cells, Butterworth, Oxford.
6. Epplen, J.T., and Lubjuhn, T., 1999. DNA Profiling and DNA Fingerprinting, Birkhauser Verlag, Basel.
7. Marx, J.L. 1989. A Revolution in Biotechnology, Cambridge Uni. Press, Cambridge.
8. Pandian, T.J. and Muthukrishnan, J. 1988. Chromosome Manipulation in Fish, M.K.University, Madurai.
9. Animal Tissue culture- **Sudha Gangal**. Second edition. University Press (India) Pvt Ltd. Hyderabad.
10. Animal Biotechnology – M. Ranga. Studam publishers, 2006.
11. Animal Biotechnology-R.Sasidhara, MJP Publishers, 2006.
12. Biotechnology- Satyanarayana. U, (2008), Books and Allied (p) Ltd
13. A Text Book of Biotechnology. R.C. Dubey. S.Chand& Co Ltd, New

STEM CELL TECHNOLOGY

Unit 1:

Stem Cell Basics: Stem cell, embryonic stem cells, embryonic germ cell, Bone marrow stem cells, Adult stem cell, Differentiation. Introduction to concepts in stem cell biology (renewal, potency, etc.). Stem cell characterizations: isolation & characterizations, markers & their identification, growth factor requirements and their maintenance in culture. Pluripotency and Reprogramming.

Unit 2:

Hematopoietic Stem Cell. Induced pluripotent stem (Ips) cell technology. Epigenetic memory in iPS cells. Epigenetic controls of stem cells. Early embryonic development. Lymphoid cell differentiation and maturation. Cell cycle regulators in stem cells. Molecular mechanisms of self-renewal, pluri/multipotency and lineage differentiation. Molecular basis of pluripotency and stem cell niche.

Unit 3:

The human umbilical cord: A source of stem cells. Isolation of mesenchymal stem cell (MSCs) from the umbilical cord. *In vitro* Differentiation potential of Umbilical cord mesenchymal stem cell. In vivo applications of UCSC. Cord blood stem cells transplantation: Advantages and disadvantages. Cord blood banking.

Unit 4:

Generation and Manipulation of Mouse Embryonic Stem Cells. Generation and Manipulation of Human Embryonic Stem Cells. Animal Models of Regeneration (Hydra, Planaria, Earthworm, Zebra fish, etc.).

Unit 5:

Cancer stem cell- The origin of cancer stem cells, the impact of cancer stem cell concept on cancer therapy. Epigenetics and Reprogramming in Stem Cell Biology. Stem Cell Gene Therapy. Stem cell therapy for neurodegenerative diseases. Stem cell therapy for cardiac regeneration. Clinical cell transplantation for leukemia. Ethical issues associated with stem cell biology.

References:

- 1) T. J. Kindt, R. A. Goldsby and B.A. Osborne, Kuby, Immunology, 2007, W. H. Freeman & Company.
- 2) P. Delves, S. Martin, D. Burton and I. Roitt, Roitt's Essential Immunology, Latest Edition, 2006, Wiley-Blackwell.
- 3) A.K. Abbas, A. Lichtman, and J. S. Pober, Cellular and Molecular Immunology, 2000, W.B. Saunders Company.
- 4) C. A Janeway, Jr, P. Travers, M. Walport, and M. J. Shlomchik, Immunology, 2001, Garland Science.

BIOPROCESS TECHNOLOGY

Unit I

Fundamentals of Bioprocess engineering: Introduction to bioprocess engineering. Media design and usage in fermentation: Types of media, composition of media – carbon sources, nitrogen sources, vitamins and growth factors, mineral, inducers, precursors and inhibitors. Microbial Growth: Isolation, Preservation and Maintenance of Industrial Microorganisms. Inoculum development: Development of inocula for yeast, bacterial, mycelial and vegetative fungal processes; aseptic inoculation of the fermentor. Proteins as enzymes, Immobilized enzymes: methods, Industrial enzymes.

UNIT- II

Sterilization methods: Moist heat; dry heat, flame, filter, gas (ethylene oxide), HTST (high temperature/short time) treatments – continuous sterilizers and pasteurizers - Sterility, asepsis– medium sterilization, batch sterilization, continuous sterilization, filter sterilization.

Microbial growth kinetics: Factors affecting microbial growth. Fermentation kinetics: Quantitative description of cellular process, Mass balances for bioreactors, Kinetic modeling, Population models. Production Kinetics: Design for single and multiple reactions - size comparisons of single reactor for single reactions, multiple reactor systems for single reaction, reactions in parallel, in series, and series-parallel reactions of first order. Heterogeneous reactions, kinetics and mechanism of heterogeneous, non catalytic, and catalytic reactions.

UNIT –III

Bioreactors: Introduction to bioreactors; Batch and Fed-batch bioreactors, Continuous bioreactors; solid state and submerged; aerobic and anaerobic fermentation; mixed microbial populations; immobilization of cells and co-immobilization; immobilized cell reactors; Bioreactor operation; Sterilization; Aeration; Sensors; Instrumentation; Analysis of mixed microbial populations, specialized bioreactors (pulsed, fluidized, photobioreactors etc.,). Design of Bioreactors: Construction material; Basic components – Agitator, aerator, Valves and steam traps, seals, stirrer glands; measurement and control of parameters (online and off line sensors) – temperature, flow rate, pressure, pH, DO, gas analysis, control pathways, computer in controlling; Air-lift, stirred tank, tower, fluidized bed, packed bed, pulsed, photo bioreactors.

UNIT -IV

Downstream Processing: Biomass removal: separation of microbial cells and solid matter; Centrifugation; Sedimentation; Flocculation; Microfiltration; Disintegration of microorganism: Sonication; Bead mills; Homogenizers; Chemical lysis; Enzymatic lysis; Membrane based purification: Ultrafiltration; Reverse osmosis; Dialysis; Diafiltration; Adsorption and chromatography: size, charge, shape, hydrophobic interactions, Biological affinity; Process configurations (packed bed, expanded bed, simulated moving beds); Precipitation (Ammonium Sulfate, solvent); Electrophoresis(capillary); Extraction(solvent, aqueous two phase, super critical), Drying – spray driers, drum driers and freeze driers.

UNIT –V

Microbial products in pharmaceutical, food and agriculture industry: Production, harvest, recovery and uses – enzymes, Antibiotics (penicillins, tetracycline, streptomycin), vitamins (B2, B12), Aminoacids (lysine, glutamic acid, arginine, threonine), Organic solvents (acetone, butanol, ethanol, glycerol); Organic acids (acetic acid, citric acid, lactic acid). Use of microbes in mineral beneficiation and oil recovery. Production, harvest, recovery and uses – Baker's yeast, milk products, edible mushrooms. Single Cell Protein (algae/fungi). Biofertilizer (Rhizobium, Azospirillum, Azolla, Phosphobacteria), Biopesticides (Bacillus thuringiensis, NPV, Pseudomonas)

Reference:

1. Principles of fermentation technology by P.F. Stanbury and A. Whitaker, Pergamon press. Second edition. 2005.
2. Fermentation microbiology and Biotechnology. Second edition, edited by El-.Mansi, C.F.A. Bryce, A.L. Demain, A.R. Allman. Taylor and Francis, 2007.
3. Introduction to Biochemical engineering by D.G.Rao, McGraw-Hill publications, I edition, 2007.
4. Industrial Microbiology by Prescott and Dunns 4th edition edited by Gerald Reed, Chapman & Hall publications 2007. Industrial microbiology by L. E. Cassida Jr.

ANIMAL BIOTECHNOLOGY - PRACTICAL

1. Animal tissue culture
2. Preparation of tissue culture medium and membrane filtration
3. Cell counting and cell viability
4. Measurement of doubling time
5. Preparation of metaphase chromosomes from cultured cells
6. Isolation of DNA and demonstration of apoptosis of DNA laddering
7. Handling of lab animals

STEM CELL TECHNOLOGY –PRACTICAL

1. Culturing of earthworm
2. Dissection of earthworm and Observation internal organs
3. Identification of different cells in the celomic fluid of the worm
4. Identification of different cells in the skin of the earthworm
5. Anterior regeneration: Amputation at 8th segment; observation and image documentation of regeneration kinetics for 10 days minimum (demo only)
6. Posterior regeneration: Amputation at 30th segment; observation and image documentation of regeneration kinetics for 10 days minimum (demo only)

Note: For the experiments 5-6, the record note should be submitted with the data of regeneration at the time of practical semester examination.. The purpose of the experiments (5-6) is to make students to understand that the earthworm can regenerate all internal organs.

BIOPROCESS TECHNOLOGY - PRACTICAL

1. Isolation of useful microorganisms from natural sources
1. Growth of microorganisms
2. Temperature effect on growth estimation of energy of activation and Arrhenius constant for microorganisms
3. Batch, fed batch and continuous cultures fermentation
4. Pure and mixed culture
5. Production of secondary metabolites in synthetic and complex industrial media
6. Screening of process variables single dimensional search, placket, Suman design, design expert etc
7. Study of rheology of fermentation, broth and power determination
8. Wine and alcohol production

APPENDIX – AZ54

MANONMANIAM SUNDARANAR UNIVERSITY - TIRUNELVELI

B.Sc., Microbiology (CBCS)

STRUCTURE OF THE UG COURSE

(For Disciplinary Subjects)

(For those who joined the course from the academic year 2012 onwards)

Eligibility for admission to the B.Sc., Course in Microbiology

Candidates shall be admitted to the course provided he / she has passed plus two examinations of the State or Central Board with Biology / Microbiology as one of the subjects.

I Semester

Semester	Part	Paper	Instruction Hours / Week	Exam Hours	Max Marks	Passing Minimum	Credits
I	I	Tamil / Other languages - Paper I	6	3	100	40	3
	II	English - Paper I	6	3	100	40	3
	III	Core Subject					
		Major I Fundamentals of Microbiology	4	3	100	40	4
		Major II Microbial Biochemistry	4		100	40	4
		Practical for Major I & II	2				
		Allied Subject I Paper I Bio instrumentation	4	3	100	40	4
		Practical for Paper I	2	-	-	-	-
	IV	Environmental studies	2	3	100	40	2
		Total (6 Courses)	30				20

II Semester

Semester	Part	Paper	Instruction Hours / Week	Exam Hours	Max Marks	Passing Minimum	Credits	
II	I	Tamil / Other languages - Paper II	6	3	100	40	3	
	II	English - Paper II	6	3	100	40	3	
	III		Core Subject					
			Major III Microbial Physiology and Metabolism	4	3	100	40	4
			Major IV Concepts in Molecular Biology	4	3	100	40	4
			Allied Subject I Environmental Monitoring and Assessment	4	3	100	40	4
			Major Practical -I	2	3	100	40	2
			Allied Practical -I	2	3	100	40	2
IV	Value based Education	2	3	100	40	2		
		Total (8 Courses)	30				24	

III Semester

Semester	Part	Paper	Instruction Hours / Week	Exam Hours	Max Marks	Passing Minimum	Credits	
III	I	Tamil / Other languages	6	3	100	40	3	
	II	English	6	3	100	40	3	
	III	Core Subject						
	III		Major -V Microbial Genetics	4	3	100	40	4
			Allied Subject Paper II Biofertilizer & Biopesticides	4	3	100	40	4
	IV	Skill Base Subject A. Medical Lab Technology OR B. Enzymology	2	3	50	20	4	
	IV		Non Major Elective					
			Paper I General Microbiology OR B. Food Microbiology	2	3	50	20	2
			Total (6 Courses)	30				20

IV Semester

Semester	Part	Paper	Instruction Hours / Week	Exam Hours	Max Marks	Passing Minimum	Credits
IV	I	Tamil	6	3	100	40	3
	II	English	6	3	100	40	3
	III	Core Subject					
		Major VI Fundamentals of Immunology	4	3	100	40	4
		Allied Subject	4	3	100	40	4
		Paper II Genetic Engineering					
		Major Practical -II	2	3	100	40	2
		Allied Practical - II	2	3	100	40	2
	IV	Skill Based Subject Paper - II Effective Communication OR Personality Development	4	3	100	40	4
		Non Major Elective					
	IV	Paper II Clinical Microbiology OR B. Basics of Biotechnology	2	3	50	20	2
	V	Extension activity : NSS / NCC / YRC / YWF	-	-	-	-	1
		Total (10 Courses)	30				25

V Semester

Semester	Part	Paper	Instruction Hours / Week	Exam Hours	Max Marks	Passing Minimum	Credits
V	III	Core Subject Major VII Agricultural Microbiology	4	3	100	40	4
		Major VIII Industrial Microbiology	4	3	100	40	4
	III	Practical for Major VII & VIII	8	-	-	-	-
		Elective Paper I - Bio informatics	5	3	100	40	5
		Paper II Dairy Microbiology	5	3	100	40	5
	IV	Skill Based Subject					
		Paper III Fermentation Technology OR Aquatic Microbiology	2	3	50	20	4
		Practical for Paper III	2	-	-	-	-
			Total (6 Courses)	30			

VI Semester

Semester	Part	Paper	Instruction Hours / Week	Exam Hours	Max Marks	Passing Minimum	Credits
VI	III	Core Subject Major IX Food Microbiology	6	3	100	40	4
	III	Major X Clinical Microbiology	6	3	100	40	4
	III	Major XI Microbial Biotechnology	5	3	100	40	4
		Major Practical -III	-	3	100	40	4
		Major Practical -IV	4	3	100	40	4
		Major Practical - V	4	3	100	40	4
	III	Elective Paper III Marine Microbiology	5	3	100	40	5
			Total (8 Courses)	30			

Total Number of courses : 40 (33T + 7P)
 Total number of hours : 180
 Total number of Credits : 140

Distribution of marks in Theory between External and Internal Assessment is 75 : 25; For Practicals 60 : 40 ; Pass minimum of 40% for external and overall components.

B.Sc., MICROBIOLOGY
SYLLABUS FOR DISCIPLINARY SUBJECTS
THIRD SEMESTER
MAJOR - III MICROBIAL GENETICS

UNIT-I:

Genetics - Historical introduction - Experiments of Hershey, Chase and Griffith - DNA structure - Circular and super helical - RNA as the genetic material - Genetic code and table - Organization and functioning of prokaryotic genetic material (Viral and E.coli) - Replication of RNA - Reverse transcriptase.

UNIT- II:

Bacterial plasmids - Structure, types and properties of plasmids- Plasmid replication - Transposons and IS elements - Structure, types and properties.

UNIT- III:

Bacteriophages - Structure - Classification - Lytic cycle and lysogenic cycle (T4 Only)

UNIT- IV:

Mutations - Spontaneous, induced, base pair changes, frame shift, deletion, insertion, tandem, duplications, transversions - Genotypic and phenotypic mutants - Reversion and suppression - Ames" test

UNIT- V:

Gene transfer mechanisms - Conjugation (Cell transmissible plasmids, F-factor and Hfr strains) - Transformation (Natural transformation, competence, DNA uptake, role of natural transformation, artificially induced competence and electroporation) - Genetic recombination (Requirements, molecular basis and genetic analysis of recombination in bacteria) - Generalized and specialized transduction.

Text Book Recommended:

1. Watson, JD., Hopkins N.H., Roberts JW., Steitz JA and Weiner A.A.M. (1987). Molecular Biology of the Gene. The BenjaminCummings Publishing Company.
2. Lewin B. (2007). Genes IX Oxford University Press. UK
3. Lodish, H, Baltimore D, Berk A, Zipursky S. L, Matsudaira P., and Damell J. (1995). Molecular Cell Biology. Scientific American Books.
4. Maloy S. R., Cronan Jr.J.E. and Freifelder.D. (1994). Microbial Genetics. Jones and Bartlett Publishers.
5. Freifelder D. (1991). Molecular Biology. Narosa Publishing House
6. Talaro, K.P., and Talaro. A. (1999). Foundations in Microbiology. WCP McGraw - Hill, New York.
7. Jeyanthi,G.P. (2008) Molecular Biology. MJP Publisher, Chennai.

ALLIED II

PAPER I - BIOFERTILISERS AND BIOPESTICIDES

UNIT-I:

Soil fertility - Bio-geo chemical cycles - Carbon, nitrogen and phosphorous - N₂ fixation: Types - Symbiotic, asymbiotic and associative symbiotic - Components and mechanisms - Phosphate solubilization

UNIT- II:

Bacterial biofertilizers - Isolation, purification - Commercial applications of *Azotobacter*, *Azospirillum*, *Rhizobium*, Phosphobacteria, Cyanobacteria, *Anabena*, *Nostoc* - Mycorrhizae (Endo and ecto) - VAM - *Pseudomonas fluorescens* - Siderophore activity

UNIT- III:

Plant pests - Brief introduction - Insects, nematodes, rodents - Most common and important examples of plants infected - Mode of infection - Symptoms - Disease

UNIT- IV:

Plants pests - Bacteria, fungi and viruses - Most and important examples of plants infected - Mode of infection - Transmission - Symptoms - Disease

UNIT- V:

Biopesticides: Bacteria (*Bacillus thuringiensis*) - *Agrobacterium tumefaciens* - *Trichoderma viridie* - *Phytophthora palmivora* - Virus (Nuclear polyhedrosis virus) - Mode of action and applications - Biopesticide developments.

Text Books Recommended:

1. Ranagasamy.G., and Bagyaraj.D.J. (1996). Agricultural Microbiology. Prentice - Hall of India Pvt Ltd., New Delhi.
2. Atlas,R.M., and Bartha.M. (2003). Microbial ecology -Fundamentals and applications. Benjamin - Cummings, Menio Park, California.
3. Talaro, K.P., and Talaro.A. (1999). Foundations in Microbiology. WCB Me Graw Hill, New York.
4. Brock, T.D., and Madigan,M.T. (1997), Biology of Microorganisms. (8th Edition) Prentice Hall, me. New York.
5. Dirk, J. Elsas, V., Trevors, J.T., Wellington, E.M.H. (1997). Modern Soil Microbiology. Marcel Dekker INC, New York, HongKong.
6. Grant W.D. and Long, P.L. (1981). Environmental Microbiology. Blackie Glasgow and London.
7. Mitchel, R. (1992). Environmental Microbiology. Wiley - John Wiley and Sons. Inc. Publications, New York.
8. Vijaya Ramesh,K. (2004). Environmental Microbiology. MJP Publishers, Chennai.
9. Moshrafuddin Ahamed and Basumatary.S.K. (2006) Applied Microbiology. MJP Publishers, Chennai.
10. Rajendran.P., and Gunasekaran. P. (2006) Microbial Bioremediation. MJP Publishers, Chennai.
11. Kalaiselvan,P.T, Ami Pandi.I. (2007). Bioprocess Technology. MJP Publihsers, Chennai

SKILL BASED SUBJECTS
PAPER - I A: MEDICAL LAB TECHNOLOGY

UNIT-I:

Organization of the clinical laboratory - Role of medical lab technician - Safety regulations, first aid, clinical lab records - Units of measurements - Laboratory calculations - Quality control of lab findings.

UNIT- II:

Haematology: Specimen collection - Routine haematological tests - Haemoglobin, haematocrit, RBC , MCV, MCH and MCHC - Differential count - Reticulocyte count - ESR - Eosinophil count - Tests for protozoan blood parasites - Blood clotting mechanisms - Bleeding time - Clotting time determination - Blood grouping.

UNIT- III:

Microbiology: Specimen collection and handling - Identification of common pathogens - Diagnosis of anaerobic infections - Diagnostic mycology - Diagnostic parasitology from faecal specimens - Laboratory identification of human parasites - Antimicrobial susceptibility tests.

UNIT- IV:

Serology: Principles of immunologic reactions - Specimen collection - Preservation - Serological tests for syphilis and typhoid - Agglutination tests - C - reactive protein (CRP) test - RA test - Serodiagnosis of streptococcal infection - Pregnancy test.

UNIT-V:

Clinical pathology: Urine analysis - Routine examination of urine - Rapid chemical test of urine - CSF - Semen analysis - Routine biochemical tests: Glucose, protein, urea, creatinin and bilirubin - Enzyme assays: Phosphatases, transaminases, creatine kinase and lactic dehydrogenases - Blood gases and bicarbonates

Text Books Recommended:

1. Ananthanarayanan,R., and PanickerJ. (2000). Text Book of Microbiology. Orient Longmans.
2. Rajan,S. (2007). Medical Microbiology. MJP Publisher, Chennai. Bernard D. Davis, Renato Dulbecco , Herman N. Eisen and Harold, S. Ginsberg. (1990). Microbiology (4th Edition).J.B.Lippincott Company, New York.
3. Prescott L.M., Harley J.P., and Klein D.A. (2008). Microbiology (7th Edition) McGraw Hill, New York.
4. Larry Me Kane and Judy Kandel (1996). Microbiology-Essentials and Applications. (2nd Edition). McGraw-Hill me. New York.
5. Madigan M.,T., Martinko. J. M., and Parker J., Brock TD. (1997). Biology of Microorganisms. (8thEdition).Prentice Hall International me, London.
6. Nester, E.W., Roberts, C.V., and Nester, M.T. (1995). Microbiology, A Human Perspective. IWOA, U.S.A.
7. Salle,A.J. (1996). Fundamental Principles of Bacteriology. (7th Edition). Tata McGraw-Hill Publishing Company Ltd, New Delhi.
8. Pelezar Jr., MJ.Chan E.C.S., and Kreig N.R. (1993). Microbiology - McGraw Hill, Inc., New York.
9. Stainer R.Y., Ingraham J.L., Wheelis M.L., and Painter P.R.(1986). General Microbiology, MacMillan Education Ltd., London.
10. Starr, M.P., Stolp, H, Truper, H.C., Balows, A., and Schegel, H.C.(1991). The Prokaryotes. A Hand Book of Habitats, Isolation and Identification of Bacteria. Springer Verlag.
11. Tortora, Funke, Case Addison 2001, Microbiology - An Introduction - 7th Edition ,Wesley Longman Inc.
12. Dubey R.C, and Maheswari, S. 2003 A Text Book of Microbiology . S. Chand & Co, New Delhi.
13. Kanai L.Mukherjee, Medical Laboratory Technology - A procedure manual for routine diagnosis tests - Tata McGraw - Hill Publishing Co., Ltd, New Delhi. Vol.I-III

SKILL BASED SUBJECTS
PAPER - I B: ENZYMOLOGY

UNIT-I:

Enzyme techniques: Activity of enzymes - Properties - Handling modes - Enzyme analysis - Isolation

UNIT- II:

Enzyme kinetics: Velocity of a reaction - Order - Progress curve - Influencing factors - Michaelis Menton kinetics

UNIT-III:

Coenzymes: Introduction - Cofactors - Substrate enzyme relationships - Classification - Characteristics

UNIT-IV:

Mechanism of enzyme action: Enzymes specificity - Active sites Mechanism of action - Pathway of enzyme - Catalytic reaction - Mapping of active site

UNIT-V:

Enzyme technology: Role of enzymes in industries and health care - Enzyme production, extraction, purification and stabilization - Abzymes - Biosensors - Ribozymes

Text Books Recommended:

1. Stryer, L. (Ed) (1995). Biochemistry. W.H. Freeman and Company, New York.
2. Donald Voet and Judith Voet. (1990). Biochemistry. John Wiley and Sons, New York.
3. Henry. R., Mahler and Eugene H.Cerdesz, (1966). Biological Chemistry. Harper International Edition, New York.
4. Hubert Styer, (1995). Biochemistry - Freeman and Company, New York.
5. Dawn B. Markus, (1994). Biochemistry. Harwad Publishing, New York.
6. William J. Marshall and Stephan .K.Bangert. (1995). Clinical Biochemistry - Metabolic and Clinical Aspects - Churchill Livingston, New York.
7. Harper's Biochemistry, Prentice- Hall International, INC Singapore
8. Zubey.CU W.W Parson and D.E.Vans. (1994). Principles of Biochemistry, Wm. C Brown Publ., England.
9. Talaro.K.P and Talaro.A. (1999). Foundations in Microbiology. WCP McGraw -Hill, New York.
10. Lehninger, Nelson and Cox 2002) Principles of Biochemistry CBS Publishing and Distributors.

11. Caldwell, D.R. (1995). Microbial Physiology and Metabolism, Wm.C. Brown Publishers, USA
12. Lansing M. Erescott, John P. Harley and Donald A. Klein. (2003). Microbiology (5th edition). McGraw-Hill Company, New York.
13. Larry McKane and Judy Kandel.(1996). Microbiology-Essentials and Applications. (2nd Edition). McGraw Hill, Inc., New York.
14. Moat, A.G. and Foster, J.W. (1988). Microbial Physiology (2nd Edition). John Wiley & Sons, New York.
15. Pelczar Jr, M.J., Chan, E.C.S., and Kreig, N.R. (1993). Microbiology, Me. Graw Hill. Inc, New York.
16. Salle,A.J. (1996). Fundamental Principles of Bacteriology (7thEdition). Tata McGraw-Hill Publishing Company Limited, New Delhi.
17. White, D. (1995). The Physiology and Biochemistry of Prokaryotes. Oxford University Press, Oxford, New York.
18. Madigan M.T., Martinko.J.M., Parker. J., and Brock T.D. (1997). Biology of Microorganisms. (8thEdition).Prentice Hall International Inc, London.
19. Nester, E.W., Roberts, C.V., and Nester, M.T. (1995). Microbiology, A Human Perspective. IWOA, U.S.A.
20. Talaro, K.P and Talaro. A. (1999). Foundations in Microbiology. WCP McGraw - Hill, New York.
21. Veerakumari.,L .(2004). Biochemistry. MJP Publishers, Chennai.
22. Meena kumari. S. (2006). Microbial Physiology. MJP Publishers, Chennai.

NON MAJOR ELECTIVE
PAPER I A : GENERAL MICROBIOLOGY

UNIT-I:

History and scope of microbiology: Discovery of microbes - Spontaneous generation - Role of microbes in disease - Industrial microbiology and microbial ecology

UNIT- II:

Microscopy - Basic types - Sterilization methods - Disinfectants - Types

UNIT-III:

Principles of staining procedures - Simple, negative and Gram's

UNIT-IV:

Components of growth media - General, selective and differential - Pure culture techniques and preservation of cultures.

UNIT-V:

Cell structure - Microbial nutrition - Growth curve

Text Books Recommended:

1. Bernard D. Davis, Renato Dulbecco, Herman N. Eisen and Harold, S. Ginsberg. (1990). Microbiology (4th Edition) J.B.Lippincott Company, New York.
2. Prescott L.M., Harley J.P., and Klein D.A. (2008). Microbiology (7th Edition) McGraw Hill, New York.
3. Larry Me Kane and Judy Kandel (1996). Microbiology-Essentials and Applications. (2nd Edition). McGraw-Hill Inc, New York.
4. Madigan M.,T., Martinko. J. M., and Parker J., Brock TD. (1997). Biology of Microorganisms. (8thEdition).Prentice Hall International Inc, London.
5. Nester, E.W., Roberts, C.V., and Nester, M.T. (1995). Microbiology, A Human Perspective. IWOA, U.S.A.
6. Pelezar Jr., M.J.Chan E.C.S., and Kreig N.R. (1993). Microbiology - McGraw Hill, Inc., New York.
7. Dubey R.C, and Maheswari, S. 2003 A Text Book of Microbiology. S. Chand & Co, New Delhi.
8. Talaro K.P., and Talaro.A. (1999). Foundations in Microbiology. WCP McGraw - Hill, New York.

NON MAJOR ELECTIVE
PAPER I B: FOOD MICROBIOLOGY

UNIT-I:

Food as a substrate for microorganisms - Mold, yeast and bacteria - General characteristics and importance.

UNIT-II:

Principles of food preservations - Asepsis - Removal of microorganisms - Anaerobic conditions

UNIT-III:

Food Spoilage (Fruits, Vegetables, Meat, Canned foods) - Sources - Control - Spoilage problems

UNIT- IV:

Preservation techniques - Freezing and refrigeration - Heat - Vacuum packing - Addition of chemicals - Additives

UNIT-V:

Food poisoning - Bacterial, viral and fungal

Text Books Recommended:

1. Adams, M.R. and Moss, M.O.(1995). Food Microbiology. The Royal Society of Chemistry, Cambridge.
2. Frazier, W.C. and Westhoff, D.C.(2008). Food Microbiology. (4th Edition). Tata McGraw Hill Publishing Co Ltd., New Delhi.
3. Jay, J.M.(1987). Modern Food Microbiology. CBS Publishers and Distributors, New Delhi.
4. Atlas, R.M. (1989). Microbiology- Fundamentals and Applications. Macmillian Publishing Company.
5. Banwart, GJ.(1989). Basic Food Microbiology. Chapman & Hall New York.
6. Vijaya Raemsh, K., (2007). Food Microbiology. MJP Publishers, Chennai

FOURTH SEMESTER
MAJOR - VI : FUNDAMENTALS OF IMMUNOLOGY

UNIT-I:

History of immunology - Immunohaematology, structure, composition, functions of the cells and organs in immune system - Blood groups, blood transfusion - Rh - Incompatibilities - Immunity - Types of immunity: Innate and acquired

UNIT-II:

Immune systems - Anatomy of lympho reticular systems - Primary lymphoid organs - Secondary lymphoid tissues - Cells of immune system - Detailed aspects of T Cells and B cells - Receptors - Activation and functions - Humoral immune response - Cell mediated immune response - Lymphokines, cytokines. ;

UNIT-III:

Antigens - Types - Properties - Haptens - Adjuvants - Vaccines - Types, toxoids, antitoxins - Immunoglobulins - Structure, types, properties and functions - Complements: Components and pathways.

UNIT-IV:

Antigen- Antibody reactions - Invivo methods (Precipitation reactions, agglutination and complement fixation) - Immunofluorescence - EQSA - RIA - Invivo methods - Skin test - Immune complex in tissue demonstration.

UNIT- V:

Hypersensitivity reactions - Antibody mediated - Type I: Anaphylaxis - Type II: Antibody-dependent cell cytotoxicity - Type III Immune complex reactions - Respective diseases and immunological methods of diagnosis - Type IV hypersensitivity reaction - MHC and transplantations.

Text Books Recommended:

1. Donald. M. Weir and John Steward. (1993). Immunology (7th Edition). ELBS, London.
2. Hue Davis. (1997). Introductory Immunology (1st Edition). Chapman & Hall Publisher, London.
3. Ivan M. Roit. (1998). Essential Immunology - Blackwell Scientific Publications, Oxford.
4. Paul (1998). Fundamental Immunology,(2nd Edition), Raver Press, New York.
5. Peter J. Delves and Ivan M. Roit (Eds) (1998) Encyclopedia of Immunology - (2nd Edition) Academic Press.
6. Ridklad, M. Aydl (1995). Immunology, (2nd Edition), Baltimore, HongKong, NMS Publication.
7. Roit, J.M. Brostaff, JJ. and Male, D.K. (1996). Immunology (4th Edition) C.V. Mosby Publisher, St. Loius.
8. Stewart Sell.(2001). Immunology, Immunopathology and Immunity. (6th Edition), ASM Press, USA.
9. Ananthanarayanan,R., and PanickerJ. (2000). Text Book of Microbiology. Orient Longmans.
10. Rajan,S. (2007). Medical Microbiology. MJP Publisher, Chennai.
11. Fathimunisa Begum (2008). Monoclonal antibodies : The hopeful drugs. MJP Publisher, Chennai.
12. Kannan.1 (2007) Immunology. MJP Publisher, Chennai.

ALLIED SUBJECT II
PAPER II : GENETIC ENGINEERING

UNIT-I:

Nucleic acids and protein synthesis - Regulation (Transcriptory and translatory process)

UNIT-II :

Restriction enzymes (Eco RI, Hind III, Sma, Hae III and BamHI) - Types and sources - Recognition sequences and utilities - Properties of DNase and RNAase.

UNIT-III :

Cloning vectors for r DNA (Plasmids, phages, cosmids, viruses, transposons, YAC and MAC) - Expression vectors for high level cloned genes - Role of promoters and expression cassettes - binary and shuttle vectors.

UNIT-IV :

Techniques of restriction mapping - Construction of chimaeric DNA - Cloning in bacteria - Molecular probes - Blotting techniques - DNA libraries.

UNIT-V:

Gene amplification - Basic PCR and its modifications - Applications of PCR in biotechnology and genetic engineering - DNA finger printing.

Text Books Recommended:

1. Brown, T.A. (1999). Gene Cloning. (3rd Edition). Chapman and Hall Publications, USA.
2. Burrell, M.M. (1993). Enzymes of Molecular Biology. Humana Press.
3. Chirikjian, J.G. (1995). Biotechnology - Theory and Techniques. Vol. II, Jones and Bartlett Publishers.
4. Gerhardt, P., Murray, R.G., Wood, W.A., and Krieg, N.R. (1994). Methods for General and Molecular Bacteriology. ASM Press, Washington D.C.
5. Glick, B.R. and Pasternak, J.J. (1998) Molecular Biotechnology - Principles - and Applications of Recombinant DNA. ASM Press, Washington D.C.
6. Lewin, B. (2000). Genes VII. Oxford University Press, Oxford.
7. Murray Moo Young (1992). Plant Biotechnology. Pergamon Press.
8. Radledge, C. and Kristiansen, B. (2001). Basic Biotechnology. (2nd Edition). Cambridge University Press.
9. Winnacker, E.L. (1987). From Genes to Clones: Introduction to Gene Technology. VCH Publications, Federal Republic of Germany.
10. Malacinski.G.M., and Freifelder. D. (1998). Essentials of Molecular Biology. Jones and Bartlett Publ.
11. Maloy, S.R., Cronan, J.R. Freifelder, D. (1994). Microbial Genetics. Jones and Bartlett Publ.
12. Macinski, G.M. and Freifelder, D. (1998). Essentials of Molecular Biology. (3rd Edition). John and Bartlett Publishers.
13. Rigby. P.W.J. (Editor). (1987). Genetic Engineering. 6th Academic Press, London.
14. Wiseman. A. (1983). Principles of Biotechnology. Chapman and Hall, New York.
15. Gupta.P-K. (1996). Elements of Biotechnology. Rastogi and Co., Meerut India
16. Michael Boylan and Kevin.E.Brown (2003). Genetic Engineering. Pearson Education (Singapore) Pte Ltd., New Delhi.
17. H.Mukhesh Pasupuleti (2006). Molecular Biotechnology. MJP Publishers, Chennai.
18. Dubey.R-C. (1996). A Text Book of Biotechnology. S.Chand and Co Ltd., New Delhi.

19. Das.H-K. (2005). Text Book of Biotechnology. Wiley Dreamtech India (P) Ltd., New Delhi
20. Sathyanarayana-U. (2005). Biotechnology. Books and Allied (P)., Kolkatta.
21. Peppler,H.J., and Perlman, D. (1979). Microbial Technology. Vol I and II, Academic Press
22. Desmond.S.T., Nicholl. (1994). An Introduction to Genetic Engineering. Cambridge Press.
23. Fathimunisha Begam (2008). Monoclonal Antibodies. MJP Publishers, Chennai.

CORE SUBJECT
MAJOR PRACTICAL- II
MICROBIAL GENETICS AND FUNDAMENTALS OF IMMUNOLOGY

1. Isolation of spontaneous mutants
2. UV-mutagenesis
3. Chemical mutagenesis (NTG)
4. Uninterrupted conjugation in bacteria
5. Interrupted mating in bacteria
6. Plasmid DNA isolation from E.coli (Demonstration)
7. Demonstration of antibiotic resistant mutants
8. Quantification of DNA
9. Quantification of RNA
10. Agarose Gel Electrophoresis (Demonstration)
11. Demonstration of Antigen -Antibody reaction - Ouchterlony technique
12. Blood grouping - Blood groups, Rh types - Total and differential counts
13. Skin tests - Immediate and delayed hypersensitivity reactions to egg proteins, bacterial and fungal antigens.

Text Books Recommended:

1. Cappuccino.J.G., and Sherman. N. (1996). Microbiology - A Laboratory Manual. Benjamin Cummins. New York
2. Kannan.N. (1996). Laboratory Manual in General Microbiology. Palani Paramount Publication, Palani
3. Gunasekaran. P. (1996). Laboratory Manual in Microbiology. New Age International Ltd., Publihsers, New Delhi.
4. SundararajT. (2005), Microbiology - Laboratory Manual. (1st Edition). Publ. Sundararaj.T, Chennai.
5. Jayaraman, J. (1985). Laboratory Manual in Biochemistry. Wiley Eastern Ltd., New Delhi.

6. Plummer. D.T. (1998), An Introduction to Practical Biochemistry. Tata McGraw Hill, New Delhi.
7. Palanivelu .P. Analytical Biochemistry and Separation Techniques.
8. Benson (2002). Microbiological Applications - Laboratory Manual in General Microbiology. International Edition, McGraw Hill Higher Education.
9. Renganathan.S., Gokul Shankar.S., Ranjit.M.S., Pankajalakshmi.V., Sivaramakrishnan.M., Selvakumar.B.N., and Mohamed Aejaz. (2001). Fungal Diseases and Diagnosis. (Vol I)
10. Collee. J.G., Fraser.A.G., Marmion.B.P., and Simmonsa. (2006). Mackie and Me Cartney Practical Medical Microbiology. (14th Edition) Elsevier Publication, New Delhi.
11. Kanai L.Mukherjee, Medical Laboratory Technology - A procedure manual for routine diagnosis tests - Tata McGraw - Hill Publishing Co., Ltd, New Delhi. Vol. I-III.

ALLIED SUBJECT - II

PRACTICAL- II

BIOFERTIZERS. BIOPESTICIDES AND GENETIC ENGINEERING.

1. Isolation of phosphate solubilising bacteria
2. Isolation of Rhizobium from root nodules
3. Identification of Cyanobacteria from paddy fields (Anabena and Nostoc)
4. Staining of VAM
5. Identification of plant pests (Insects and Nematodes)
6. Observation of bacterial, fungal and virally infected plant parts
7. Isolation of Bacillus thuringiensis and Trichoderma viridii from soil (Demonstration).
8. DNA estimation: Qualitative (Di phenylamine method)
9. Protein estimation: Qualitative (L6wr method)
10. Isolation of plasmid (Demonstration)
11. Isolation of bacteriophages (Demonstration)
12. Polymerase Chain Reaction (Demonstration)

Text Books Recommended:

1. Cappuccino.J.G., and Sherman. N. (1996). Microbiology - A Laboratory Manual. Benjamin Cummins. New York
2. Kannan.N. (1996). Laboratory Manual in General Microbiology. Palani Paramount Publication, Palani
3. Gunasekaran. P. (1996). Laboratory Manual in Microbiology. New Age International Ltd., Publishers, New Delhi.

4. SundararajT. (2005), Microbiology - Laboratory Manual. (1st Edition). Publ. Sundararaj.T, Chennai.
5. Jayaraman, J. (1985). Laboratory Manual in Biochemistry. Wiley Eastern Ltd., New Delhi.
6. Plummer. D.T. (1998). An Introduction to Practical Biochemistry. Tata McGraw Hill, New Delhi.
7. Palanivelu .P. Analytical Biochemistry and Separation Techniques.
8. Benson (2002). Microbiological Applications - Laboratory Manual in General Microbiology. International Edition, McGraw Hill Higher Education.
9. Renganathan.S., Gokul Shankar.S., Ranjit.M.S., Pankajalakshmi.V., Sivaramakrishnan.M., Selvakumar.B.N., and Mohamed Aejaz. (2001). Fungal Diseases and Diagnosis. (Vol I)
10. Collee. J.G., Fraser.A.G., Marmiori.B.P., and Simmons. (2006). Mackie and Me Cartney Practical Medical Microbiology. (14th Edition) Elsevier Publication, New Delhi.
11. Kanai L.Mukherjee, Medical Laboratory Technology - A procedure manual for routine diagnosis tests - Tata McGraw - Hill Publishing Co., Ltd, New Delhi. Vol. I-III

SKILL BASED SUBJECT

PAPER II

A. Personality Development

OR

B. Effective communication

A. Personality Development

UNIT - I

PERSONALITY - Definition- Determinants - Personality Traits - Theories of Personality - Importance of Personality Development. SELF AWARENESS - Meaning - Benefits of Self-Awareness - Developing Self-Awareness. SWOT - Meaning - Importance - Application - Components. GOAL SETTING Meaning - Importance - Effective goal setting - Principles of goal setting - Goal setting at the Right level.

UNIT-II

SELF MONITORING - Meaning - High self-monitor versus Low self monitor - Advantages and Disadvantages self monitor - Self-monitoring and job performance. PERCEPTION - Definition - Factors influencing perception - Perception process - Errors in perception - Avoiding perceptual errors. ATTITUDE - Meaning - Formation of attitude - Types of attitude - Measurement of Attitudes - Barriers to attitude change - Methods to attitude change. ASSERTIVENESS - Meaning - Assertiveness in Communication - Assertiveness Techniques - Benefits of being Assertive - Improving Assertiveness.

UNIT-III

TEAM BUILDING - Meaning - Types of teams - Importance of Team building - Creating Effective Team. LEADERSHIP - Definition - Leadership style - Theories of leadership - Qualities of an Effect leader. NEGOTIATION SKILLS - Meaning - Principles of Negotiation - Types of Negotiation - The Negotiation Process - Common mistakes in Negotiation process. CONFLICT MANAGEMENT - Definition - Types of Conflict - Levels of Conflict - Conflict Resolution - Conflict management.

UNIT-IV

COMMUNICATION - Definition - Importance of communication - Process of communication - Communication Symbols - Communication network - Barriers in communication - Overcoming Communication Barriers. TRANSACTIONAL ANALYSIS - Meaning - EGO States - Types of Transactions - Johari Window - Life Positions. EMOTIONAL INTELLIGENCE - Meaning - Components of Emotional Intelligence - Significance of managing Emotional Intelligence - How to develop Emotional Quotient. STRESS MANAGEMENT - Meaning - Sources of Stress - Symptoms of Stress - Consequences of Stress - Managing Stress

UNIT - V

SOCIAL GRACES - Meaning - Social Grace at Work - Acquiring Social Graces. TABLE MANNERS - Meaning - Table Etiquettes in Multicultural Environment - Do's and Don'ts of Table Etiquettes. DRESS CODE - Meaning - Dress Code for Selected Occasions - Dress Code for an Interview. GROUP DISCUSSION - Meaning - Personality traits required for Group Discussion - Process of Group Discussion - Group Discussion Topics. INTERVIEW - Definition - Types of skills - Employer Expectations - Planning for the Interview - Interview Questions - Critical Interview Questions

References:

1. Dr. S. Narayana Rajan, Dr. B. Rajasekaran, G. Venkadasalapathi, V, Vijuresh Nayaham and Herald M. Dhas, Personality Development, Publication Division, Manonmaniam Sundaranar University, Tirunelveli, 2010.
2. Stephan P. Robbins, Organisational Behaviour, Tenth Edition, Prentice Hall of India Private Limited, New Delhi, 2008.
3. Jit S. Chandan, Organssationai Behaviour, Third Edition, Vikas Publishing House Private Limited, 2008
4. Dr. K. K. Ramachandran and Dr. K.K, Karthick, From Campus to Corporate, Macmillan publishers India Limited, New Delhi, 2010.

B. EFFECTIVE COMMUNICATION

Unit I: Listening

Listening in to audio and videotapes of conversations and speeches, announcements instructions and making notes.

Unit II: Speaking

- Using correct expressions in given situations / Contexts. Role-play, narration of jokes, commentary on (important) events, festivals and matches, conducting quizzes, introducing VIPs and welcoming an audience, proposing vote of thanks, compeering college functions or youth festivals, sports events, miming radio / TV announcements making simple advertisements, conducting interviews, presenting reports, group discussion.

Unit III: Reading

- Providing exercises to test the students' ability to read and comprehend.
- Tasks or passages to improve the students average reading speed. Extensive readers may be included.
- Passages of different types - narrative, descriptive and explorative, may be used as class room materials to train students in different types of reading

Unit IV: Writing

- Tasks. assignments, exercises on various current topics may be provided.
- Report writing, preparing agenda and writing minutes for meeetings effective use of SMS, applying for job, Resume and effective profiling.
- Emergency communication through print & Electronic media

Unit V: Vocabulary

Traditional and innovative tasks may be devised.

Materials:

1. Leo Jone's New international Business English (Cambridge University Press)
2. B. Jean Naterop and Rod Revell-s Telephoning in English(Cambridge)
3. Reader's Digest How to Write and Speak Better
4. Robert Barras's Students Must Write (Routledge)
5. Norman Lewis"s Word Power Made Easy
6. Owen Webster's Read Well and Remember (ELBS)
7. Dr. Francis Soundararaj's Teaching Spoken English and Communication Skills (T.R.Publications)

A Course book may be prepared by experts in the university area

V. Testing and Evaluation

NON MAJOR ELECTIVE
PAPER II
A: CLINICAL MICROBIOLOGY
OR
B: BASICS OF BIOTECHNOLOGY

A: CLINICAL MICROBIOLOGY

UNIT-I:

Sources of infection - Routes of transmission - Control measures - Testing by Koch's postulates - Antibiotic sensitivity testing.

UNIT- II:

Bacterial pathogens - *Streptococcal, Staphylococcal, E.coli, Vibrio, Salmonella, Shigella and Mycobacterium*

UNIT- III:

Fungal pathogens - *Candida, Aspergillus* - Dermatophytes.

UNIT- IV:

Viral pathogens - Pox virus, mumps virus, rabies virus and HIV.

UNIT-V:

Protozoan pathogens - Malarial, amoebic, giardiasis and yellow fever.

Text Books Recommended:

1. Ananthanarayanan,R., and Panicker J. (2000). Text Book of Microbiology. Orient Longmans.
2. Rajan,S. (2007). Medical Microbiology. MJP Publisher, Chennai. Bernard D. Davis, Renato Dulbecco , Herman N. Risen and Harold, S. Ginsberg. (1990). Microbiology (4th Edition). J.B.Lippincott Company, New York.
3. Prescott L.M., Harley J.P., and Klein D.A. (2008). Microbiology (7th Edition) McGraw Hill, New York.
4. Larry Me Kane and Judy Kandel (1996). Microbiology-Essentials and Applications. (2nd Edition). McGraw-Hill Inc, New York.
5. Madigan M.T., Martinko. J. M., and Parker J., Brock TD. (1997). Biology of Microorganisms. (Sedition).Prentice Hall International Inc, London.
6. Nester, E.W., Roberts, C.V., and Nester, M.T. (1995). Microbiology, A Human Perspective. IWOA, U.S.A.
7. Salle,A.J. (1996). Fundamental Principles of Bacteriology. (7th Edition). Tata McGraw-Hill Publishing Company Ltd, New Delhi.
8. Pelczar Jr., M.J.Chan E.C.S., am? Kreig N.R. (1993). Microbiology -McGraw Hill, Inc., New York.

9. Stainer R.Y., Ingraham J.L, Wheelis M.L., and Painter P.R.(1986). General Microbiology, MacMillan Education Ltd., London.
10. Starr, M.P., Stolp, H., Truper, H.C., Balows, A., and Schegel, H.C.(1991). The Prokaryotes. A Hand Book of Habitats, Isolation and Identification of Bacteria. Springer Verlag.
11. Tortora, Funke, Case Addison 2001, Microbiology - An Introduction - 7th Edition ,Wesley Longman Inc
12. Dubey R.C, and Maheswari, S. 2003 A Text Book of Microbiology . S. Chand & Co, New Delhi.
13. Kanai L.Mukherjee, Medical Laboratory Technology - A procedure manual for routine diagnosis tests - Tata McGraw - Hill Publishing Co., Ltd, New Delhi. Vol.I-III

B : BASICS OF BIOTECHNOLOGY

UNIT-I:

History of biotechnology - Selection of industrial microorganisms - Media and strain improvement

UNIT-II:

Fermentation process - Standard fermenter - Types of fermentation (Batch, continuous and fed batch) - media used

UNIT-III:

Industrial production of enzymes (Amylase) - Beverages (Wine)
- Antibiotics (Penicillin),,

UNIT-IV:

Vaccine production and therapeutic agents - Attenuated and live
- Engineered organisms

UNIT-V:

Role of microbes in agriculture and environment -GMO's

Text Books Recommended:

1. Gupta.P.K. (1996). Elements of Biotechnology. Rastogi and Co., Meerut. India
2. Mukhesh Pasupuleti (2006). Molecular Biotechnology. MJP Publishers, Chennai.
3. Dubey.R-C. (1996). A Text Book of Biotechnology. S.Chand and Co. Ltd., New Delhi.
4. Das.HK. (2005). Text Book of Biotechnology. Wiley Dreamtech India (P) Ltd., New Delhi
5. Sathyanarayana..U. (2005). Biotechnology. Books and Allied (P),, Kolkatta.
6. Pepler.H.J., and Perlman, D. (1979). Microbial Technology. Vol I and II, Academic Press

PART-IV: EXTENSION ACTIVITIES

(NCC, NSS, YRC or YWF)

FIFTH SEMESTER

MAJOR - VII AGRICULTURAL MICROBIOLOGY

UNIT-I:

Physical and chemical characteristics of soil - Microbial flora of soil biota (Bacteria, fungi, algae and nematodes).

UNIT-II:

Microbial interactions - Symbiosis, mutualism, commensalisms, competition, amensalism, synergism, parasitism and predation – Rumen microbiology.

UNIT-III:

Biofertilisers - Biological nitrogen fixation - Symbiotic nitrogen fixation (Rhizobium sp) - Asymbiotic nitrogen fixation (Azotobacter sp) - Associated symbiosis (Azospirillum sp) - Cyanobacteria (Nostoc} - VAM : Ectomycorrhizae and endomycorrhizae.!

UNIT-IV:

Microbial association with higher plants- Rhizosphere - Rhizobium: Infection, inoculation and nodule formation - Phylloplane association with animals - Plant diseases: Symptoms, etiology, life cycle and -management of

bacterial (Blight of paddy, citrus canker and fungal (Late blight of potato and stem rust of wheat) diseases) - Biopesticides.

UNIT-V:

Major bio-geochemical cycles: Carbon, nitrogen, phosphorous and sulphur - Xenobiotic degradation.

Text Books Recommended:

1. Ranagasamy.G., and Bagyaraj.D.J. (1996). Agricultural Microbiology. Prentice - Hall of India Pvt Ltd., Mew Delhi.
2. Atlas,R.M., and Bartha.M. (2003). Microbial Ecology –Fundamentals and applications. Benjamin - Cummings, Menio Park, California.
3. Talaro, K.P., and-Talaro.A. (1999). Foundations in Microbiology. WCB Me Graw Hill, New York. i
4. Dirk, J. Elases, V., Trevors, J.T., and Wellington, E.M.H. (1997). Modern Soil Microbiology. Marcel Dekker INC, New York, HongKong.
5. Grant W.D. and Long, P.L. (1981). Environmental Microbiology. Blackie Glasgow and London.

6. Mitchel, R. (1992). Environmental Microbiology. Wiley - John Wiley and Sons. Inc. Publications, New York.
7. Vijaya Ramesh, K. (2004). Environmental Microbiology. MJP Publishers, Chennai.
8. Moshrafuddin Ahamed and Basumatary. S.K. (2006) Applied Microbiology. MJP Publishers, Chennai.
9. Rajendran. P., and Gunasekaran.)P. (2006) NTicrobial Bioremediation. MJP Publishers, Chennai.
10. Kalaiselvan, P.T., Ami Pandi. I. (2007). Bioprocess Technology. MJP Publishers, Chennai
11. Bemard D. Davis, Renato Dulbecco, Herman N. Eisen and Harold, S. Ginsberg. (1990). Microbiology. (4th Edition). J.B. Lippincott Company, New York.
12. Prescott L.M., Harley J.P., and Klein D.A. (2008). Microbiology. (7th Edition) McGraw Hill, New York.
13. Larry Me Kane and Judy Kandel (1996). Microbiology-Essentials and Applications. (2nd Edition). McGraw-Hill Inc, New York.
14. Madigan M., T., Martinko. J. M., and Parker J., Brock TD. (1997). Biology of Microorganisms. (8th Edition). Prentice Hall International Inc. London.
15. Nester, E.W., Roberts, C.V., and Nester, M.T. (1995). Microbiology – A Human Perspective. IWOA, U.S.A.
16. Salle, A.J. (1996). Fundamental Principles of Bacteriology. (7th Edition). Tata McGraw-Hill Publishing Company Ltd, New Delhi.
17. Pelezar Jr., M.J. Chan E.C.S., and Kreig N.R. (1993). Microbiology. McGraw Hill, Inc., New York.
18. Stainer R.Y., Ingraham J.L., Wheelis M.L., and Painter P.R. (1986). General Microbiology. MacMillan Education Ltd., London.

MAJOR - VIII INDUSTRIAL MICROBIOLOGY

UNIT-I:

Historical development and concepts - Principles, screening and selection of industrial microorganisms - Strain improvement (Bacteria, fungi and yeast).

UNIT-II:

Industrial sterilization - Fermentation equipments - Designing and their uses - Types of fermentation - 'Batch, continuous, fedbatch, dual, submerged and solid state - Down stream processing.

UNIT-III:

Fermentation media - Formulation strategies - Sterilization methods - Economical means of providing energy' - Role of carbon, nitrogen, vitamin, mineral resources, buffers, precursors, inhibitors, inducers and antifoam agents.

Unit-IV:

Production of alcoholic beverages (Brewing and wine making) - Enzymes (Amylase and protease) - Amino acid (Glutamic acid) – Solvents (Acetone and butanol) - Organic acids (Vinegar and citric acid).

Unit-V:

Antibiotics - Production- and formulations - Inoculum production - Commercial production of antibiotics (Penicillin and streptomycin - Production of vitamins riboflavins.

Text Books Recommended:

1. Reed.G. (Editor), Industrial Microbiology. CBS Publishers, AVI Publishing Company.
2. Demain.A.L., and Solomon. N.A.(1986). Manual of Industrial Microbiology and Biotechnology. ASM Press. USA.
3. Hershnergy.C.L Queener. S.W and Hegeman.Q Genetics and Biotechnology of Industrial Microorganisms. ASM Press. USA.
4. Stanbury, P.F.A., Whitaker and .Hal.S.J. (1995). Principles of Fermentation Technology. (2nd Edition). Pergamon, U.K.
5. Casida. L.E. (1989). Industrial Microbiology. Willey Eastern Limited, New Delhi.
6. Waif Crueger and Anneliese Cruer.(2002). Biotechnology - A Text Book of Industrial Microbiology. Sinauer Associates Inc. Laderiand, USA
7. Ward,O.P.(1998). Fermentation Biotechnology-Principles, Process and Products ;
8. Jackson.A.T. Process Engineering'in Biotechnology.
9. Nielson & Viiladson. Bioreactron Engineering Principles.
10. Prescott & Dunn. (1992). Industrial Microbiology. (4* Edition).
11. Glazer & Nikaido (1998). Microbial Biotechnology
12. Bemard D. Davis, Renato Dutbecco , Herman N. Eisen and Harold, S. Ginsberg. (1990).Microbiology. (4 Edition). J.B.Lippincott Company, New York.
13. Kalaiselvan, P.T., Arulpandi.I. (2007). Bioprocess Technology. MJP Publihsers, Chennai.
14. Hershnergy.CL., Queenersw arid Hegemanq(1998). Genetics and Biotechnology of Industrial Microorganism. ASM Press. USA.
15. Pepler,H.J., and Perlman, D. (1979). Microbial Technology. Vol I and II, Academic Press
16. Prescott L.M., Harley J.P., and Klein D.A. (2008). Microbiology. (7th Edition). McGraw Hill, New York.
17. Madigan M.,T., Martinko. J. M., and Parker J., Brock T.D. (1997). Biology of Microorganisms. (8110. Prentice Hall International Inc, London.
18. Pelezar Jr., M.J.Chan E.C.S., and Kreig N.R. (1993). Microbiology. McGraw Hill, Inc., New York.
19. Dubey R.C, and Maheswari, S. (2003) A Text Book of Microbiology. S. Chand & Co, New Delhi. ;

MAJOR ELECTIVE
PAPER I : BIOINFORMATICS

UNIT-I:

Basic knowledge on computer packages - Windows 98 2000 – MS Office - Word, excel, power point - Internet - Electronic mail – Search engines.

Unit- II:

Bioinformatics - Definition, , goal, scope and limitations of bioinformatics - Different branches of bioinformatics - Terminologies: Internet browser, software, hardware, data base, network nicnet - Infflibnet, EMP net, operating system.

Unit-III:

Biological data and data bases: Biological data type, classification of biological data base and sequence data base - Secondary nucleotide and protein sequence data bases - Structure data base - Data entry formats - Applications.

Unit-IV:

Sequencing genomes - Sequence assembly - Genome on the web - Annotating and analyzing genome sequences - Gene hunting - EST search - Pair wise and multiple alignment techniques - Proteomics - Protein data bank - Gene bank - Profiles and motifs.

Unit-V:

Commercial data base and soft ware - Types - Applications – Analysis packages - Applications of bioinformatics in biological research.

Text Books Recommended:

1. Bosu. O.U., and Thukral.S.K. (2007). Bioinformatics - Data bases, Tools, Algorithms. Oxford Univ.Press, New Delhi
2. Emmanuel.C., Ignachimuthu.S., and Vincent.S. (2006). Applied Genetics - Recent Trends and Techniques. MJP Publishers, Chennai.
3. Chikahale.N.J., and Gomase.V.S. (2007). Bioinformatics. Theory and Practical. Himalaya Publishing House, New Delhi.
4. Cynthia Gibas & Per Jambeck (2001) Developing Bioinformatics Computer Skills. Shroff Publishers and Distributors Pvt. Ltd (O'Reilly), Mumbai
5. Baxevanis, A.D. and Ouellette, B.F.F. (2001). Bioinformatics: A practical guide to the analysis of genes and proteins . Wiley Interscience – New York
6. Des Higgins & Willie Taylor (2000) Bioinformatics: Sequence, structure and databanks. Oxford University Press
7. HH Rashidi & LK Buehler (2002) Bioinformatics Basics: Applications in Biological Science and Medicine. CRC Press, London

8. David W. Mount. Bioinformatics: Sequence and Genome Analysis. Cold Spring Harbor Laboratory Press
9. Richard Durbin, Sean R. Eddy, Anders Krogh, Graeme Mitchison. Biological Sequence Analysis : Probabilistic Models of Proteins and Nucleic Acids Cambridge University Press
10. Andreas D. Baxevanis, B. F. Francis Ouellette, Wiley-Interscience. Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins. (2nd Edition)
11. MarkerS., and Lenon. D. (2003) .Sequence Analysis in a Nutshell: A Guide to Common Tools and Databases.
12. Bergeron,B.P. (2002). Bioinformatics Computing. Prentice Hall
13. Krane.D.E., Raymer.M.L, and Marieb.E.N. (2002). Fundamental Concepts of Bioinformatics. BenjaminCummings

MAJOR ELECTIVE
PAPER II ; DAIRY MICROBIOTGY

UNIT-I:

Introduction - Sources of microorganisms in milk - Classification of microbes - Biochemical types, characteristics and pathogenicity.

Unit- II:

Bacteriological examination of milk, preservation of milk, pasteurization, sterilization and dehydration - Microbial standard and milk grading.

Unit-III:

Dairy products - Fermented milks - Flavoured milks, curd, butter milk, cheese, milk cream, condensed milk and yogurt - Lactic starter cultures - Contamination - Spoilage - Preservation.

Unit-IV:

Milk borne diseases - Microbial and viral diseases in cattle's – Control measures.

Unit-V:

Preservatives used for dairy products - Mode of preservation – Time period - Standards - Analytic procedure in dairy microbiology.

Text Books Recommended:

1. Adams, M.R. and Moss, M.O.(1995). Food Microbiology. The Royal Society of Chemistry, Cambridge.
2. FrazierW.C. and Westhoff, D.C.(2008). Food Microbiology. (4th Edition). Tata McGraw Hill Publishing Co Ltd., New Delhi.
3. Jay, J.M.(1987). Modern Food Microbiology. CBS Publishers and Distributors, New Delhi.

4. Atlas, R.M. (1989). Microbiology- Fundamentals and Applications. Macmillian Publishing Company.
5. Banwart, G.J.(1989). Basic Food Microbiology. Chapman & Hall New York.
6. Board, R.C.(1983). A Modem Introduction to Food Microbiology. Blackwell Scientific Publications, Oxford.
7. Robinson, R.K.(1990). Dairy Microbiology. Elsevier Applied Science, London.
8. Hobbs, B.C. and Roberts, D.(1993). Food Poisiong and Food Hygiene. Edward Arnold (A Division of Hodder and Stoughton), London.
9. Robinson, R.K., (1990). Dairy Microbiology. Elsevier Applied Sciences, London.
10. Vijaya Raemsh, K., (2007). Food Microbiology. MJP Publishers, Chennai
11. Kharatyan, S.G. (1978). Microbes as Food for Humans. Annual Rev Microbiol, 32:301-307.
12. Sudhir Andrews (2008). Food and) Beverage Management. McGraw Hill Companies, New Delhi
13. Neelam Khetarpaul (2006). Food Microbiology. Daya Publishing House, New Delhi.
14. S.N.Tripathy (2006). Food Biotechnology. Dominant Publishers and Distributors, New Delhi.
15. Robinson. R.K. (1990). Dairy Microbiology. Elsevier Applied Sciences, London

SKILL BASED SUBJECTS

PAPER III

A. FERMENTATION TECHNOLOGY

OR

B. AQUATIC MICROBIOLOGY

A. FERMENTATION TECHNOLOGY

UNIT-I:

General considerations - Metabolic pathways and control mechanisms of primary and secondary metabolites.

UNIT-II:

Fermentation in batch culture: Growth kinetics - Measurement of growth, nutrient and product formation - Heat evolution - Effect of environment.

Unit-III:

Media formulation - Sterilization methods - Kinetics of thermal death - Batch and continuous sterilization.

Unit-IV:

Continuous culture system - Properties - Productivity – Product formation.

Unit-V:

Aeration and agitation - Power requirement - Oxygen transfer kinetics - Concept of Newtonian and Non -Newtonian fluids - Viscosity - Foam and Anti-foam - Fermenter types - Advantages.

Text Books Recommended:

1. Reed.G. (Editor), Industrial Microbiology. CBS Publishers, AVI Publishing Company.
2. Demain.A.L., and Solomon. N.A.(1986). Manual of Industrial Microbiology and Biotechnology. ASM Press. USA.
3. Hershnergy.C.L Queener. S.W and Hegeman.Q Genetics and Biotechnology of Industrial Microorganisms. ASM Press. USA.
4. Stanbury, P.F.A., Whitaker and .Hal.S.J. (1995). Principles of Fermentation Technology. (2nd Edition). Pergamon, U.K.
5. Casida. L.E. (1989). Industrial Microbiology. Willey Eastern Limited, New Delhi.
6. Walf Crueger and AnnelieseCrueger.(2002). Biotechnology- A Text Book of Industrial Microbiology. Sinauer Associates Inc. Laderiand, USA
7. Ward,O.P.(1998). Fermentation Biotechnology-Principles, Process and Products
8. Jackson.A.T. Process Engineering p Biotechnology.
9. Nielson & Villadson. Bioreaction Engineering Principles.
10. Prescott & Dunn. (1992). Industrial Microbiology. (4th Edition).
11. Glazer & Nikaido (1998). Microbial Biotechnology
12. Bemard D. Davis, Renato Dulbecco, Herman N. Eisen and Harold, S. Ginsberg. (1990).Microbiology. (4* Edition). J.B.Lippincott Company, New York.
13. Kalaiselvan, P.T., Arulpandi.I. (2007). Bioprocess Technology. MJP Publishers, Chennai.
14. Hershnergy.CL., Queenersw arid Hegemanq(1998). Genetics and Biotechnology of Industrial Microorganism. ASM Press. USA.
15. Pepler,H.J., and Perlman, D. (1979). Microbial Technology. Vol I and II, Academic Press
16. Prescott L.M., Harley J.P., and Klein D.A. (2008). Microbiology. (7th Edition). McGraw Hill, New York.
17. Madigan M.,T., Martinko. J. M., and Parker J., Brock T.D. (1997). Biology of Microorganisms. (8thEdition). Prentice Hall International Inc, London.
18. Pelezar Jr., M.J.Chan E.C.S., and Kreig N.R. (1993). Microbiology. McGraw Hill, Inc., New York.
19. Dubey R.C, and Maheswari, S. (2003) A Text Book of Microbiology. S. Chand & Co, New Delhi.

B -AQUATIC MICROBIOLOGY

UNIT-I:

Types of aquatic systems - Fresh water (Ponds, lakes and streams) - Marine habitats (Estuaries, mangroves, deep sea, hydrothermal vents, saltpans and coral reefs).

UNIT-II:

Zonation - Upwelling - Eutrophication - Food chain

Unit-III:

Water quality - Potability - Assessment methods - Indicators of water pollution - Water borne diseases - Diseases in aquatic animals (Fish)

Unit-IV:

Bio-geochemical cycles - Carbon, nitrogen and phosphorous.

Unit-V:

Microbial degradation (Hydrocarbons, Pesticides), Bioaccumulation and Bioremediation.

Text Books Recommended:

1. Grant W.D. and Long, P.L. (1981). Environmental Microbiology. Blackie Glasgow and London.
2. Mitchell, R. (1992). Environmental Microbiology. Wiley - John Wiley and Sons. Inc. Publications, New York.
3. Vijaya Ramesh, K. (2004). Environmental Microbiology. MJP Publishers, Chennai.
4. Moshrafuddin Ahamed and Basumatary. S.K. (2006) Applied Microbiology. MJP Publishers, Chennai.
5. Rajendran. P., and Gunasekaran. P. (2006) Microbial Bioremediation. MJP Publishers, Chennai.
6. Prescott L.M., Harley J.P., and Klein D.A. (2008). Microbiology. (7th Edition) McGraw Hill, New York.
7. Madigan M., T., Martinko. J. M., and Parker J., Brock TD. (1997). Biology of Microorganisms. (8th Edition). Prentice Hall International Inc, London.
8. Nester, E.W., Roberts, C.V., and Nester, M.T. (1995). Microbiology – A Human Perspective. IWOA, U.S.A.
9. Peleazar Jr., M.J. Chan E.C.S., and Kreig N.R. (1993). Microbiology. McGraw Hill, Inc., New York.

SIXTH SEMESTER
MAJOR - IX FOOD MICROBIOLOGY

UNIT-I:

Food as a substrate for microorganisms - Microorganisms important in food microbiology - Bacteria, molds and yeasts - Brief account of each group - General characteristics and importance - Principles of food preservation - Asepsis - Removal of microorganisms – Anaerobic conditions - Microbial standards in various foods.

UNIT-II:

Contamination of foods - Sources- of contamination - Control - Spoilage problems in the manufacturing units.

Unit-III:

Principles of food preservation - Food processing - Methods of preservation: Physical (Irradiation, drying, heat processing, chilling, freezing, high pressure and modification of atmosphere). Chemical (Sodium benzoate, acids and additives) - Canning - Shelf life – Food sanitation - Hazard analysis, critical control points and personal hygiene.

Unit-IV:

Contamination, spoilage and microbiology of specific foods: Cereals and cereal products - Eggs and poultry, dairy products, milk, buttermilk, curd, ice cream and yoghurt, fresh meat, fish and prawn and their dried products, fresh and dried fruits and vegetables, pickles and bread – Canned foods - Sugar products.

Unit-V:

Food poisoning - Food borne infections - Bacterial (*Staphylococcus*, *Brucella*, *Bacillus*, *Clostridium*, *Escherichia* and *Salmonella*) –Fungal (Mycotoxins including aflatoxins) -Viral (Hepatitis) - Protozoa (*Entamoeba*).

Text Books Recommended:

1. Adams, M.R. and Moss, M.O.(1995). Food Microbiology. The Royal Society of Chemistry, Cambridge.
2. Frazier, W.C. and Westhoff, Q.C.(2008). Food Microbiology. (4th Edition). Tata McGraw Hill Publishing Co Ltd., New Delhi.
3. Jay, J.M.(1987). Modern Food Microbiology. CBS Publishers and Distributors, New Delhi.
4. Atlas, R.M. (1989). Microbiology- Fundamentals and Applications. Macmillian Publishing Company.
5. Banwart, GJ.(1989). Basic Food Microbiology. Chapman & Hall New York.
6. Board, R.C.(1983). A Modern Introduction to Food Microbiology. Blackwell Scientific Publications, Oxford.
7. Robinson, R.K.(1990). Dairy Microbiology. Elsevier Applied Science, London.

8. Hobbs, B.C. and Roberts, D.(1993). Food Poisoning and Food Hygiene. Edward Arnold (A Division of Hodder and Stoughton), London.
9. Robinson, R.K., (1990). Dairy Microbiology. Elsevier Applied Sciences, London.
10. Vijaya Raemsh, K., (2007). Food Microbiology. MJP Publishers, Chennai
11. Kharatyan, S.G. (1978). Microbes as Food for Humans. Annual Rev Microbiol, 32: 301-307.
12. Sudhir Andrews (2008). Food and Beverage Management. McGraw Hill Companies, New Delhi
13. Neelam Khetarpaul (2006). Food Microbiology. Daya Publishing House, New Delhi.
14. S.N.Tripathy (2006). Food Biotechnology. Dominant Publishers and Distributors, New Delhi.
15. Robinson. R.K. (1990). Dairy Microbiology. Elsevier Applied Sciences, London

MAJOR - X CLINICAL MICROBIOLOGY

UNIT-I:

Normal microbial flora of the human body - Sources of infection: Food, water, vector and air - Modes of transmission: Direct - person to person and animal to person - Indirect: Air and other modes (Food, water and insects) - Koch's postulates - Control measures - Virulence factors of microbes - Invasiveness and pathogenicity - Non specific resistant factors.

UNIT-II:

Diagnostic Microbiology - Collection and transport of specimen for microbiological examination - General methods for isolation and identification of bacteria. Typing of bacterial isolates - Sero-diagnosis.

Unit-III:

Clinical symptoms - Epidemiology, pathogenesis, laboratory diagnosis, prevention and treatment of the following bacterial infections (a) Streptococcal infections, (b) Staphylococcal infections, (c) Meningitis, (d) Tuberculosis, (e) Leprosy, (f) Gastrointestinal disorders - Typhoid, cholera, bacillary dysentery, (g) Sexually transmitted diseases - Syphilis and gonorrhoea, (h) Anaerobic wound infection - Tetanus and gas gangrene.

Unit-IV:

Clinical symptoms - Epidemiology, pathogenesis, laboratory diagnosis, prevention and treatment of the following viral infections (a) Respiratory infections, common cold, influenza, measles, mumps and rubella, (b) Neurological infection - Encephalitis (Dengue and Japanese encephalitis). Rabies (c) Liver diseases : Hepatitis A,B,C,D & E (d) Immunodeficiency diseases, AIDS, CMV (Cytomegaloviruses) and herpes simplex viruses.

Unit-V:

Clinical symptoms - Epidemiology, pathogenesis, laboratory, prevention and treatment of the following fungal and protozoan infections (a) Fungal - superficial, subcutaneous and systemic mycoses, (b) Protozoan: Amoebiasis, malaria and leishmaniasis; (c) Helminths - filariasis, ascariasis and zoonotic diseases - Hospital acquired infections.

Text Books Recommended:

1. Ananthanarayanan,R., and PanickerJ. (2000). Text Book of Microbiology. Orient Longmans, i
2. Rajan,S. (2007). Medical Microbiology. MJP Publisher, Chennai. Bernard D. Davis, Renato Dulbecco , Herman N. Eisen and Harold, S. Ginsberg. (1990). Microbiology (4th Edition).J.B.Lippincott Company, New York. |
3. Prescott L.M., Harley J.P., and Klein D.A. (2008). Microbiology (7th Edition) McGraw Hill, New York.
4. Larry Me Kane and Judy Kandel (1996). Microbiology-Essentials and Applications. (2nd Edition). McGraw-Hill Inc, New York.
5. Madigan M.,T., Martinko. J. M., and Parker J., Brock TD. (1997). Biology of Microorganisms. (8th Edition).Prentice Hall International Inc, London.
6. Nester, E.W., Roberts, C.V., and Nester, M.T. (1995). Microbiology, A Human Perspective. IWOA, U.S.A.
7. Salle,A.J. (1996). Fundamental Principles of Bacteriology. (7th Edition). Tata McGraw-Hill Publishing Company Ltd, New Delhi.
8. Pelezar Jr., M.J.Chan E.C.S., and Kreig N.R. (1993). Microbiology - McGraw Hill, Inc., New York.
9. Stainer R.Y., Ingraham J.L., Wheelis M.L., and Painter P.R.(1986). General Microbiology, MacMillan Education Ltd., London
10. Starr, M.P., Stolp, H., Truper, H.C., Balows, A., and Schegel, H.C.(1991). The Prokaryotes. A Hand Book of Habitats, Isolation and Identification of Bacteria. Springer Verlag.
11. Tortora, Funke, Case Addison 2001, Microbiology - An Introduction - 7th Edition ,Wesley Longman Inc.
12. Dubey R.C, and Maheswari, S. 003 A Text Book of Microbiology . S. Chand & Co, New Delhi.
13. Kanai L.Mukherjee, Medical Laboratory Technology - A procedure manual for routine diagnosis tests - Tata McGraw - Hill Publishing Co., Ltd, New Delhi. Vol.I-III.

MAJOR - XI : MICROBIAL BIOTECHNOLOGY

UNIT-I:

Biotechnology - Definition - Concepts - History and achievements.

UNIT-II:

Enzyme production technology through microbes: Problems and applications - Enzyme immobilization and its applications.

UNIT-III:

Microalgal technology - Industrial cultivation methods of Spirulina - Biotechnological potentials of microalgae - Food - Feed - Fuel production - Pharmaceutically valuable compounds from microalgae.

Unit-IV:

Principles and applications of rDNA technology - Cloning vectors for DNA (Plasmids, phages and YAC - Expression vectors (Binary and shuttle) - Gene libraries - PCR (Standard PCR).

Unit-V:

Production of biotechnological products. Food-SCP (Algae, yeast, mushroom). Biofertilizer - (Cyanobacteria, Rhizobium, Azospirillum, Azotobacter, Frankia and VAM). Bioinsecticide (Bacillus thuriengiensis) - Fuel (Ethanol) - Pharmaceuticals - Antigens, interferons, vaccines, insulin, hormones and gene therapy methods - Hybridoma and monoclonal antibodies.

Text Books Recommended:

1. Chirikjian, J.G. (1995). Biotechnology - Theory and Techniques. Vol. II, Jones and Burtlett Publishers.
2. Gerhardt, P., Murray, R.G., Wopd, W.A., and Kreig, N.R. (1994). Methods for General and Molecular Bacteriology. ASM Press, Washington D.C.
3. Glick, B.R. and Pasternak, J.J. (1998) Molecular Biotechnology - Principles and Applications of Recombinant DNA. ASM Press, Washington D.C.
4. Lewin, B. (2000). Genes VII. Oxford University Press, Oxford.
5. Murray Moo Young (1992). Plant Biotechnology. Pergamon Press.
6. Radledge, C. and Kristiansen, B. (2001). Basic Biotechnology. (2nd Edition). Cambridge University Press.
7. Winnacker, E.L. (1987). From Genes to Clones: Introduction to Gene Technology. VCH Publications, Federal Republic of Germany.
8. Malacinski.G.M., and Freifelder. D. (1998). Essentials of Molecular Biology. Jones and Bartlett Publ. i

9. Maloy, S.R., Cronan, J.R. Freifelder, D. (1994). Microbial Genetics. Jones and Bartlett Publ.
10. Macinski, G.M. and Freifelder, D. (1998). Essentials of Molecular Biology. (3rd Edition). John and Bartlett Publishers.
11. Rigby. P.W.J. (Editor). (1987). Genetic Engineering. 6th Academic Press, London.
12. Wiseman. A. (1983). Principles of Biotechnology. Chapman and Hall, New York.
13. Gupta.RK. (1996). Elements of Biotechnology. Rastogi and Co., Meerut. India
14. Michael Boylan and Kevin.E.Brown (2003). Genetic Engineering. Pearson Education (Singapore) Pte Ltd., New Delhi.
15. Mukhesh Pasupuleti (2006). Molecular Biotechnology. MJP Publishers, Chennai.
16. Dubey.R.C. (1996). A Text Book of Biotechnology. S.Chand and Co Ltd., New Delhi.
17. Das.H.K. (2005). Text Book of Biotechnology. Wiley Dreamtech India (P) Ltd., New Delhi
18. Sathyanarayana..U. (2005). Biotechnology. Books and Allied (P) ., Kolkatta.
19. Pepler,H.J., and Perlman, D. (1979). Microbial Technology. Vol I and II, Academic Press
20. Desmond.ST., Nicholl. (1994). An Introduction to Genetic Engineering. Cambridge Press.
21. Fathimunisha Begam (2008). Monoclonal Antibodies. MJP Publishers, Chennai.
22. Brown, T.A. (1999). Gene Cloning. (3rd Edition). Chapman and Hall Publications, USA.

PRACTICALS FOR CORE SUBJECT
MAJOR PRACTICAL III- AGRICULTURAL MICROBIOLOGY

1. Quantitative assay of microbes in soil
2. Isolation of phosphate solubilising bacteria from soil
3. Enumeration of Azotobacter sp from soil
4. Isolation of nitrogen fixing microorganisms from root nodules
5. Estimation of microbial count from phyllosphere
6. Soil analysis - pH, chloride, nitrate, calcium, magnesium and phosphorous
7. Demonstration of VAM in roots
8. Microscopic examination of Cyanobacteria (Nostoc, Anabena, Gleocapsa etc.,)
9. Preparations of biofertilizers -Demonstration
10. Plant diseases - Bacterial (Blight of paddy and citrus canker). Fungal diseases (Late blight of potato and stem rest of wheat)
11. Observation of symptoms of virally infected-leaves - Demonstration

Text Books Recommended:

1. Cappuccino.J.G., and Sherman.1 N. (1996). Microbiology – A Laboratory Manual. Benjamin Cummins. New York
2. Kannan.N. (1996). Laboratory Manual in General Microbiology. Palani Paramount Publication, Palani
3. Gunasekaran. P. (1996). Laboratory Manual in Microbiology. New Age International Ltd., Publihsers, New Delhi.
4. SundararajT. (2005), Microbiology - Laboratory Manual. (1st Edition). Publn. Sundararaj.T, Chennai.
5. Jayaraman, J. (1985). Laboratory Manual in Biochemistry. Wiley Eastern Ltd., New Delhi.
6. Plummer. D.T. (1998). An Introduction to Practical Biochemistry. Tata McGraw Hill, New Delhi. ;
7. Palanivelu .P. Analytical Biochemistry and Separation Techniques.
8. Benson (2002). Microbiological Applications - Laboratory Manual in General Microbiology. International Edition, McGraw Hill Higher Education.
9. Renganathan.S., Gokul Shankar;S., Ranjit.M.S., Pankajalakshmi.V., Sivaramakrishnan.M., SelvakumaiB.N., and Mohamed Aejaz. (2001). Fungal Diseases and Diagnosis. (Vol I)
10. Collee. J.G., Fraser.A.G., Marmion.B.P., and Simmons. (2006). Mackie and Me Cartney Practical Medical Microbiology. (14th Edition) Elsevier Publication, New Delhi.
11. Kanai L.Mukherjee, Medical Laboratory Technology - A procedure manual for routine diagnosis tests - Tata McGraw - Hill Publishing Co., Ltd, New Delhi. Vol.I-III.

PPRACTICALS FOR CORE SUBJECT
MAJOR PRACTICAL- IV: FOOD AND INDUSTRIAL MICROBIOLOGY

1. Evaluation of milk quality - Methylene blue reduction test
2. Milk testing by Resazurin method
3. Qualitative and quantitative analysis of microbes in fruits and - vegetables - Surface washing and internal tissues - TVC
4. Microbial examination of meat - Surface washing and internal tissues -TVC
5. Microbial examination of fish - Surface washing and internal tissues - TVC
6. Testing of soft drinks
7. Isolation of yeast from grapes
8. Production of ethanol from cane sugar using yeast cells - Demonstration
9. Wine production using yeast - Demonstration
10. Antibiotic production by bacteria or actinomyces - Demonstration

Text Books Recommended:

1. Cappuccino.J.G., and Sherman. N. (1996). Microbiology – A Laboratory Manual. Benjamin Cummings. New York
2. Kannan.N. (1996). Laboratory Manual in General Microbiology. Palani Paramount Publication, Palani.
3. Gunasekaran. P. (1996). Laboratory Manual in Microbiology. New Age International Ltd., Publishers, New Delhi.
4. SundararajT. (2005), Microbiology - Laboratory Manual. (1st Edition). Publ. Sundararaj.T, Chennai.
5. Jayaraman, J. (1985). Laboratory Manual in Biochemistry. Wiley Eastern Ltd., New Delhi.
6. Plummer. D.T. (1998). An Introduction to Practical Biochemistry. Tata McGraw Hill, New Delhi.
7. Palanivelu .P. Analytical Biochemistry and Separation Techniques.
8. Benson (2002). Microbiological Applications - Laboratory Manual in General Microbiology. International Edition, McGraw Hill Higher Education.
9. Renganathan.S., Gokul Shankar.S., Ranjit.M.S., Pankajalakshmi.V., Sivaramakrishnan.M., Selvakumar.B.N., and Mohamed Aejaz. (2001). Fungal Diseases and Diagnosis. (Vol I)
10. Collee. J.G., Fraser.A.G., Marmion.B.P., and Simmons. (2006). Mackie and McCartney Practical Medical Microbiology. (14th Edition) Elsevier Publication, New Delhi.
11. Kanai L.Mukhejee, Medical Laboratory Technology - A procedure manual for routine diagnosis tests - Tata McGraw - Hill Publishing Co., Ltd, New Delhi. Vol.I-III

PRACTICALS FOR CORE SUBJECT
MAJOR PRACTICAL – V: CLINICAL MICROBIOLOGY AND BIOTECHNOLOGY

1. Microbiological analysis for the defecation of pathogens in urine samples - E.coli and Pseudomonas sp
2. Throat swab examination - Streptococcus and Haemophilus for respiratory pathogens
3. Stool culture for enteric pathogens - Salmonella, Shigella, Vibrio and E.coli.
4. Stool examination for amoebic cysts and ova
5. Antibiotic susceptibility testing by Disc diffusion method (E.coli and Staphylococcus aureus)
6. Microscopic slide observations of fungal and protozoan pathogens
7. Widal testing - Demonstration
8. ELISA Technique - Demonstration
9. Vermi composting - Demonstration
10. Mushroom cultivation - Demonstration
11. Immobilization of bacterial cells and enzymes
12. Preparation of bio-fertilizers - Demonstration
13. Preparation of single cell proteins form Spirulina - Demonstration

Text Books Recommended:

1. Cappuccino.J.G., and Sherman. N. (1996). Microbiology – A Laboratory Manual. Benjamin Cummins. New York
2. Kannan.N. (1996). Laboratory Manual in General Microbiology. Palani Paramount Publication, Palani
3. Gunasekaran. P. (1996). Laboratory Manual in Microbiology. New Age International Ltd., Publihsers, New Delhi.
4. SundararajT. (2005), Microbiology - Laboratory Manual. (1st Edition). Publn. Sundararaj.T, Chennai.
5. Jayaraman, J. (1985). Laboratory Manual in Biochemistry. Wiley Eastern Ltd., New Delhi.
6. Plummer.D.T. (1998). An Introduction to Practical Biochemistry. Tata McGraw Hill, New Delhi.
7. Palanivelu .P. Analytical Biochemistry and Separation Techniques.
8. Benson (2002). Microbiological Applications - Laboratory Manual in General Microbiology. International Edition, McGraw Hill Higher Education.
9. Renganaman.S., Gokul Shankar.S., Ranjit.M.S., Pankajalakshrm.V., Sivaramakrishnan.M., Selvakumar.B.N., and Mohamed Aejaz. (2001). Fungal

Diseases and Diagnosis. (Vol I)

10. Collee. J.G., Fraser.A.G., Marmiorj.B.P., and Simmons. (2006). Mackie and Me Cartney Practical Medical Microbiology. (14th Edition) Elsevier Publication, New Delhi.
11. Kanai L.Mukherjee, Medical Laboratory Technology - A procedure manual for routine diagnosis tests - Tata McGraw - Hill Publishing Co., Ltd, New Delhi. Vol.I-III

MAJOR ELECTIVE
PAPER III: MARINE MICROBIOLOGY

UNIT-I:

Classification of marine organisms.- Marine ecosystem: Intertidal zones, inhabitants - Ecology of estuaries, salt marshes, mangroves, swamps, coral reefs and deep sea - Conventional and modern methods of studying microorganisms - Archaeobacteria and other special groups - Methanogens.

UNIT-II:

Methods of studying marine microorganisms - Collection, enumeration, isolation and identification based on morphological, physiological and biochemical characteristics - Preservation of marine microbes (Halophilic, psychrophilic, hydrothermalvents, barophilic etc.,) Microbial nutrition - Influence of environmental factors on microbial growth and activity.

UNIT-III:

Bio-geochemical cycles - Nitrogen, carbon, phosphorous and sulphur cycles - Decomposition of organic matter - Primary production - Eutrophication - Microbial degradation of natural and synthetic waste materials.

Unit-IV:

Sea food microbiology - Normal genera associated with fish, food spoilage, human pathogens and contaminants - Microbial indicators of pollution - Probiotic bacteria and their importance in aquaculture.

Unit-V:

Bio fouling and prevention - Microbes of biotechnological importance - Primary and secondary metabolites - Bioactive compounds from sea.

Text Books Recommended:

1. Atlas,R.M., andBartha.M. (2003). Microbial ecology-Fundamentals and applications. Benjamin - Cummings, Menio Park, California.
2. Talaro, K.P., and Talaro.A. (1999)1 Foundations in Microbiology. WCB Me Graw Hill, New York.

3. Brock, T.D., and Madigan, M.T. (1997), *Biology of Microorganisms*. (8th Edition) Prentice Hall, Inc, New York.
4. Dirk, J. Elsas, V., Trevors, J.T., Wellington, E.M.H. (1997). *Modern Soil Microbiology*. Marcel Dekker INC, New York, HongKong.
5. Grant W.D. and Long, P.L. (1981). *Environmental Microbiology*. Blackie Glasgow and London.
6. Mitchel, R. (1992). *Environmental Microbiology*. Wiley - John Wiley and Sons. Inc. Publications, New York.
7. Vijaya Ramesh, K. (2004). *Environmental Microbiology*. MJP Publishers, Chennai.
8. Moshrafuddin Ahamed and Basumatary, S.K. (2006) *Applied Microbiology*. MJP Publishers, Chennai.
9. C. B. Munn (2003) *Marine Microbiology: Ecology & Applications*
10. David L. Kirchman (Ed). *Microbial Ecology of the Oceans* (Wiley Series in Ecological and Applied Microbiology)
11. Kenneth Mann and John Lazier. *Dynamics of Marine Ecosystems: Biological-Physical Interactions in the Oceans*.

APPENDIX – AZ55

MANONMANIAM SUNDARANAR UNIVERSITY, Tirunelveli –12
B.Sc Physical Education

CBCS 2012-2013 Onwards

I Semester

Components	Core/Allied	Title	Hours	Credits
Part I		Tamil/other (1 course)	6	3
Part II		English (1 course)	6	3
Part III	Core I	Foundation of Physical Education (1 course)	4	4
	Core II	Theories of Yoga (1 course)	4	4
	Core PI	Gymnastics (Carry over Practical)	2	--
	Allied I	Anatomy and Physiology (1 course)	4	4
	Allied PI	Yoga (Carry over Practical)	2	--
		Environmental Studies (1 course)	2	2
	Total	(6 courses)	30	20

II Semester

Components	Core/Allied	Title	Hours	Credits
Part I		Tamil (1 course)	6	3
Part II		English (1 course)	6	3
Part III	Core III	Theories of Gymnastics (1 course)	4	4
	Core IV	Statistics in Physical Education (1 course)	4	4
	Core P I	Gymnastics (Practical) (1 course)	2	2
	Allied II	Health Education ,Safety Education and First aid (1 course)	4	4
	Allied P I	Yoga (Practical) (1 course)	2	2
		Value Based Education (1 course)	2	2
	Total	(8 courses)	30	24

III Semester

Components	Core/Allied	Title	Hours	Credits
Part I		Tamil	6	3
Part II		English	6	3
Part III	Core V	Psychology and Sociology in Physical Education (1 course)	4	4
	Core P II	Intensive Teaching Practice Practical(1 course)	2	--
Part IV	Skill Based Subject I	Sports Medicine (1 Course)	4	4
	Non Major Elective I	Theories of Yoga (For other than Physical Education courses) (1 course)	2	2
	Allied III	Computer Applications in Physical Education (Theory) (1 course)	4	4
	Allied P II	Computer Applications in Physical Education (Practical) (1 course)	2	--
	Total	7 Courses	30	20

IV Semester

Components	Core/Allied	Title	Hours	Credits
Part I		Tamil	6	3
Part II		English	6	3
	Core VI	Organization and Administration in Physical Education (1 course)	4	4
Part III	Core P II	Teaching Practice (Practical) (1 course)	2	2
Part IV	Skill Based Subject II	Personality Development	4	4
	Non Major Elective	Principles and History of Physical Education and Sports (For other than Physical Education Courses)	2	2
	Allied IV	Applied Kinesiology	4	4
	Allied PII	Computer Application in Physical Education (Practical) (1 course)	2	2
Part V		Extension Activity (NCC,NSS,YRC,YWF)		1
	Total	9 Courses	30	25

V Semester

Components	Core/Allied	Title	Hours	Credits
Part III	Core VII	Theories of Games (Basket Ball, Foot ball Hockey Cricket, Volley ball) (1 course)	4	4
	Core VIII	Theories of Track and Field (1 course)	4	4
	Major Elective	Sports Nutrition	5	5
	Major Elective	Exercise Physiology (1 course)	5	5
	Core P III	Major Game (Basket Ball, Foot ball Hockey Cricket, Volley ball) Any one Game (Carry Over Practical)	3	--
	Core PIV	Track and Field Events (Carry Over Practical)	3	--
	Core P V	Physiotherapy (Carry Over Practical)	2	--
Part IV	Skill Based III	Bio-Mechanics in Sports	4	4
	Total	6 Courses	30	22

VI Semester

Components	Core/Allied	Title	Hours	Credits
Part III	Core IX	Test, Measurement and Evaluation (1 course)	6	4
	Core X	Principles of Sports Training (1 course)	6	4
	Core XI	Sports Physiotherapy (1 course)	5	4
	Major Elective	Sports Journalism and Mass Communication	5	5
	Core P III	Major Game (Basket Ball, Foot ball Hockey Cricket, Volley ball) Any one Game (Practical) (1 course)	3	4
	Core P IV	Track and Field events (Practical) (1 course)	3	4
	Core P V	Physiotherapy(Practical) (1 course)	2	4
	Total	7 Courses	30	29

Total Number of Courses 40

Total Number of Hours 180

Total Number of Credits 140

Value Based Education

III Semester

Core V - PSYCHOLOGY AND SOCIOLOGY IN PHYSICAL EDUCATION

- Unit I** Meaning Scope and nature of psychology and sociology of physical education and sports Facts of psychology, Motor learning - factors that effect on motor learning, stages of learning theories, role of perception in physical education and sports.
- Unit II** Growth and development age and behaviour characterists Personality- nature of personality various traits of personality and its relation to performance in physical education and sports. Motivation- meaning and is role in physical education and sports.
- Unit III** Main tasks in psychological preparation. Psychological aspects of short term and long term training. Psychological Qualities Psycho-regulative procedures:
- a. Autogenic training
 - b. Relaxation with music
 - c. Relaxation with yogic practices
- Unit IV** Meaning Scope and nature of sociology of physical education and sports. Physical education and sports as a social phenomenon product of culture and its relationship with other elements of culture Sports as regulation institution of society -State and religion Relationship of physical education and sports with other socializing institutions (family and educational system).
- Unit V** Social significance of sports. Relationship of physical education and sports with other socializing institutions (family and educational system) Sports and social problems Behaviour of sportsmen and spectators. Leadership through physical education and sports.

References:-

1. Alderman. A.B "Psychology Behaviour in Sports", W.B Saunders Company, Saunder 1974.
2. Cratty B.J "Psychology and Physical Activity", London Prentice Hall Inc., 1961.
3. Cratty, B.J Psychology in Contemporary Sports," Prentice Hall Inc. Englewood Cliff. 1973.
4. Cratty B.J Social Dimension of Physical Activity "New Jerchy, Printice Hall inc.
5. Cratty B.J Social Psychology in Athletics," New Jersey, prentice, Hall Inc. , 1981.
6. Frots and Renbon," Psychological Concepts Applied to "Physical Education and Coaching" Masseurchusetts. 1971.
7. Rane, J.E "Psychological Aspects of Physical Education and Sports" London Routledge and Keganpau. 1972.
8. Jawther, J.D Psychology and Coaching new jersey, prentice Hall inc. 1951.
9. Motens social psychology and phycial activity new york harper and row publishers 1975.

Skill Based I - SPORTS MEDICINE

- Unit I** Definition, Need, Nature and Scope of Sports Medicine.
Importance of Sports Medicine in Physical Education and Sports
- Unit II** Different sports Rate in promoting Physical Fitness - Walking, Jogging, Swimming, Cycling, Dancing, And Skipping.
- Unit III** Women in Sports: - Performance and Sexual differences, Drugs and Doping.
- Unit IV** Injuries: Blisters, - contusions Flaematornas, Cramps and Muscle Strain, Joint Sprain, Dislocation, Fracture.
- Unit V** Sports Physiotherapy - Methods, Effect, Indication and Contra indication.
Exercise - Classification and Therapeutic uses.
Bandage - Types, Application.
Strapping for major joint & body parts.

References:-

1. Starkey, Chad / Therapeutic Modalities of Athletic trainers, F.A. Davis Company, Philadelphia, 1990.
2. Prentice Williams, E., Therapeutic Modalities Sports Medicine : ST. Louis, 1990.
3. Sundararajan / Sports Medical Lectures: Rosan Publication, Chennai.
4. Edward Donald, Physiotherapy Occupations Theraphy and gymnastics, London.
5. St.John Ambulance, etc., First Aid Manual : St. John Ambulance, London, 1997.
6. Pande P.K. and L.C, Gupta, outline of Sports Medicine : Jaypee Brothers, New Delhi, 1987.

Non Major Elective (For other than Physical Education Courses)

THEORIES OF YOGA

- Unit I** Meaning of yoga - Aim and objectives of Yoga - concept of yoga, History of yoga.
- Unit II** Systems of Yoga - Eight limbs of yoga - Asanas - Classification of Asanas - Differences between Physical exercises and yogic exercises - guidelines for practicing Asanas.
- Unit III** Procedure of doing Asanas. Asanas in Long sitting Position - Prone Position - Supine Position - Standing Position - Kneeling Position.
- Unit IV** Pranayama - Types & Concepts of Pranayama - Closing the nostrils - Controlling the breath - Bhandhas - Practice regulation - Importance of suspension (Kumbhaka) - Kriyas and its types.

Unit V Meditation and its Types. Role of Meditation on Sports and importance of meditation on human life.

References :-

1. B.K.S., Iyengar Light on Yoga, London : Unwin Paperbacks, 1989.
2. P. Mariayyah - "Pranayamas" Sports Publication, Coimbatore.
3. K. Chandrasekaran, "Sound health through yoga" Prem Kalyan Publication, Sedapatti, 1999.
4. Yogeshwar, "Text Book of Yoga", Madras yoga Centre.
5. Kumaresan P, yogasanam, Tirunelveli : Abinaya Publications, 2002.

Allied III - COMPUTER APPLICATIONS IN

PHYSICAL EDUCATION

- Unit I** Computer – Meaning, History, – Components of Computer – Input Devices (Punch Card, Paper tape, Light pen, Screen touch, Keyboard, joystick, Track ball, Mouse, Plotter) Output device (Printer, Dot Matrix, Laser Printer, inkjet Printer, Visual Display unit) External Storage Devices – Floppy Disks & Hard Disk – Memory CD Rom – CPU – ALU
- Unit II** Software and Hardware – Languages (Machine, Assembly, High level) – Local Area Network (LAN – Internet – Multimedia)
- Unit III** Introduction to MS Word – Creating Word documents – Editing document text – Selecting – copying – deleting text – Aligning and formatting text – setting line space – using table – finding and replacing text – Spelling Grammar – Aligning text vertically – setting Margin – printing option – using mail merge.
- Unit IV** Introduction to MS Excel - Entering and Editing cell entries – Working with numbers – creating formulas – Adjusting Column width and row height, inserting and deleting rows and cells - copying contents – Naming work sheet – copying and moving worksheet – Entry and deleting worksheet – Aligning text – Borders – Understanding charts – Pie chart.
- Unit V** Computer Applications in Physical Education – Office Management Teaching, learning and coaching modules.

References:-

1. Vikas Gupta, Rapidex, Computer Course, Putak Mahal, Delhi, 1995.
2. French, C.S. Data Processing, Galgotia Book Source, New Delhi, 1986.
3. Damielh, Slotnick and others, Computer Applications.
4. Haggery, T., The administrative use of computers in professional Sport Organization, Inc., New York

Core Practical II
Intensive Teaching Practice
(Carry Over Practical)
Allied Practical II
Computer Applications in Physical Education
(Carry Over Practical)
IV Semester

Core VI - ORGANIZATION AND ADMINISTRATION IN PHYSICAL EDUCATION

- Unit I** Meaning and importance of organization and Administration Scheme of Physical Education in Schools, Colleges, Universities, District State and National level Working Federation.
- Unit II** Facilities and Standards-Layout of play fields for major Games, BasketBall, cricket, Hockey, Football, Volleyball, Kho-Kho, Kabaddi, Handball, Ball Badminton, Badminton, and Tennis. Finance-Budgeting-Equipments-care and maintenance-maintaining Records and Registers
- Unit III** Methods in Physical Education-Meaning, Factors influencing method-Presentation Techniques- Personal and Technical-Teaching Aids-Class Management -Methods of Teaching Physical activities.
- Unit IV** Lesson Plan-preparing lesson plan (General and Specific) Teaching Activities-Major and Minor Games-Track and Field Teaching activities of minor games, Major games track and Field, Yogic Practice, Suryanamaskar, Gymnastics, Swimming, Calisthenics, Light apparatus, Rhythmic activities, Indigenous activities – Commands, Marching.
- Unit V** Intramural and Extramural competitions- Incentives and awards Tournaments- Knock out, league, Combination and Challenge Tournaments-Methods of drawing fixtures (League, Single Knock out). Merits and Demerits of League and Knock out tournaments

References

1. Voltmer & Esslinger/organization and administration of physical education : Apleton, Countryu crofts.
2. Kamlesh, M.L., Management concepts physical education and sport Metropolitan Book Co., Pvt., Ltd., Nethaji Subhash Marg, New Delhi.
3. Thirunarayanan, C.and S.Harihara Sharma, Methods in Physical Education Karaikudi, C.J. and S.H. 1989.
4. Kamlesh, M.L., Scientific Art of Teaching Physical Education, New Delhi: Metroplitan, 1995.
5. Joseph, P., Organization and administration of Physical Education, Gwalior, Kayman, Cassdiy & Jackson : Methods in Physical Education, B.Saudees Co.,
6. Bucher, Chales and Krotee, Mar L, Management of physical Education and Sport, Mospy, London, 1997.
7. Sharma, Sita Ram, Organisation and administration of games and sports : Book Enclave, Jaipur, 1997.

SKILL BASED II
PERSONALITY DEVELOPMENT

Non Major Elective
(For other than Physical Education Courses)

PRINCIPLES AND HISTORY OF PHYSICAL EDUCATION

- Unit I** Meaning, Need, Nature and Scope of Physical Education,
Aim and objectives of Physical Education
Physical Training and Physical Culture, Philosophy and Physical Education, Recreation and its types.
- Unit II** Physical Education in Ancient Greece (Athens and Sparta)
Physical Education in India, YMCA and its contributions for sports in India, Recent Developments on sports in India, SAI, NSNIS, LNIPE, SDAT, Sports Academics,
- Unit III** National and International Trophies – (Santhosh trophy- Ranji trophy – Federation cup- Rengasamy cup, Sivanthi gold cup)
ATP- Chennai Open Thomas cup- upper Cup Davis cup- Wimbledon- Grandslam- Euro cup.
World Cup Competitions- Cricket World Cup, FIFA World Cup
- Unit IV** Sports competitions – (Asian games –Commonwealth games- SAF, Games BDS and RDS).
Olympic Games (Ancient and Modern), Olympic flag, Olympic Torch.
The Marathon race
- Unit V** National Awards and Honors in Sports, Arjuna Award, Rajiv Gnadhi Khel Ratna award, Dhronacharya award, Maulana Abulkalam Azad award. Sports Scholarships for excellent sports persons in state and central government. National Sports day.

References:-

1. Wellman and Cowell, Philosophy and Principles of Physical Education, Amarvati Suyog Prakasan.
2. Thirunarayanan, C. and Hariharan, S., Analytical History of Physical Education, Karaikudi, C.T. & S.H. PUB., 1990.
3. sharma, O.P., History of Physical Education, New Delhi : Khel Shitya Kendra, 1998.
4. Jackson Sharman/Modern Principles of Physical Education : A.A. Barnes & Co., New York.

Allied IV- APPLIED KINESIOLOGY

- Unit I** Meaning and Definition, Brief History of Kinesiology, Aim and Objectives of Kinesiology. Importance of Kinesiology in Physical Education and Sports
- Unit II** Classification of Muscles - All or None Law- centre of gravity- line of gravity.
- Unit III** Different planes- criteria for good posture, causes for poor posture-Postural deformities- correction for Lordosis, Khyposis, Scoliosis- Application of kinesiology to motor skills and daily living.
- Unit IV** Structure and functions of joints Elbow joint, wrist joint, shoulder joint knee joint ankle joint and hip joint.
- Location, Origin, insertion, and action of muscles-
- Trapezius, Pectorlis Major, Deltoid, Biceps Rectus Femrosis,
- Hamstring group of muscles ,Gastrocnemius
- Unit V** Muscular Analysis of Fundamental movements: Walking, Running, Jumping and Throwing. Warm – up, Warm down, Muscle cramp, Muscle pull.

References:

1. Luttgens, Kathryn and others / Kinesiology Scientific Basis of human motion; Dubuque, 1A, WMC, Brown Communication, Inc., 1992.
2. Thimson, Clern, W and R.T. Floyol / Manual of Structure Kinesiology : St. Louis Marby, 1994.
3. David I. Kelly / Kinesiology and fundamentals of motion description, prentice hall.
4. Copper and Glassgow, Kinesiology, Jaint Louis C.S. Mosby Company, 1976.
5. Jenson, R.Claynes, Gordon W. Schultz and Blauer, L., Bangertar, Applied Kinesiology and Biomechanics, MCgraw – Hill Book Company, New York, 1984.

Core Practical II

INTENSIVE TEACHING PRACTICE

General Lesson Plan and Particular Lesson Plan.

Unit I

Assembly and roll call

- a) Class handling
- b) Assembly and disposal
- c) March past

Unit II

Callisthenic Exercises (Free arm Exercises)

- a) Sitting exercises
- b) Standing exercises
- c) Bending exercises
- d) Stepping exercises
- e) Moving exercises
- f) Lunging exercises
- g) Clapping exercises

Unit III

Exercise with Equipments

- a) Dumbbells
- b) Indian Clups
- c) Vands
- d) Scoop
- e) Pole Drill

Unit IV

Exercises without Equipments

- a) Baithaks
 - b) Dhands
- Minor games

Unit V

a) Teaching skills on major games and athletic events

- i) Demonstration
- ii) Teaching
- iii) Correcting the mistakes
- iv) Lead up activities

Allied Practical II

COMPUTER APPLICATIONS IN PHYSICAL EDUCATION

1. Typing sports correspondence letters using MS WORD
2. Table formation using MS WORD
3. Preparing fixtures using MS WORD
4. Creating charts using EXCEL
5. Statistical and mathematical functions using MS EXCEL
6. Mail Merge
7. Internet operations
8. Preparing Sports Invitations using Word Art
9. Preparing Score Sheets for various games and Track and Field
10. Power Point presentation

Extension Activity (NCC, NSS, YRC, YWF)

V Semester

Core VII - THEORIES OF GAMES

(Basketball, Cricket, Foot ball, Hockey, & Volleyball)

- Unit I** a) History of the Games: World, India.
b) Organization of Games: (Working Federations): World, India.
- Unit II** Training Warm-up, Warming- down, . Specific Warming for the Games
Essential fitness Components Conditioning, Load.
- Unit III** Fundamental Skills and Advanced Skills
Types of Skills, Special Applied Mechanics
- Unit IV** Tactics and Strategy: Systems in the Games, Lead -up Games, Evaluation.
- Unit V** Rules of Games
a) Rules and their interpretations.
b) Method of officiating and scoring
c) Layout and maintenance of play fields
d) Equipments and their specifications.

References:-

1. Cole man brain and peter ray,basset hall ,East ardsley,Ep publishingltd.,1976.
2. Tyson frank The Cricket Coaching Manual ,Calcutta,Rupa &Co.,1985.
3. Andrew keith ,Bob carter and les lenham,Cricket ,East ardesly,Ep Publishing ltd.,1978.

4. Amarnath Mohinder ,learn to play Good cricket ,Delhi ,surjeet publications.
5. Thomson willam teaching soccer ,Delhi ,surjeet publications
6. Dhanraj V.Hubert ,volley ball ,A modern approach ,patila ,SAINSNIS ,1971
7. Cox H.Richard Teaching Volley ball ,delhi ,surjeet publiucations
8. James Dane,Volley ball for schools ,delhi,S.Chand&Company ltd.
9. Saggar S.k .,Skills and Tatics: Volleyball, Delhi Lokesh Thani Sports Publiction,1984.
- 10.Larche, Harry, F, Techinques to Football Coaching" London, A.S. Barnes and company 1969.
11. Carting Ganagon, "Play Better Soccer, in All Colour" W.B,Saundess Company, 1972.
- 12.Wein Horat, " The Science of Hockey:" London, Pelham Books, 1970.
- 13.Milford, D.S Hockey Practice and Tactics, London Mnolds and Company, 1949.
14. Colberk, A.L, "Modern Basketball - A Fundamental Analysis of Skills and Tacties" London, Nicholes Kayl 1966.

Core VIII --THEORIES OF TRACK AND FIELD

Unit I	History of Track and Field: India, Asia, and World. Organisation of Track and Field, Federations: India, World Track and Field Events.
Unit II	Warm-up, Warm down, Physical fitness Qualities, load and safety measures in track and field. Techniques in Sprints, Middle Distance and Long distance Running, types of starts, acceleration and finishing.
Unit III	Techniques in Jumps: Long Jump, Triple Jump, High Jump, Pole vault Techniques in Throws: Shot Put, Discus Throw, Javelin Throw, Hammer Throw
Unit IV	Combined Events Decathlon, Heptathlon, Pentathlon and Triathlon. Scoring system of combined events Techniques in Hurdles, and Relay Races
Unit V	Competitions, Rules, Officiating, Equipments and their specifications, Standard and Non Standard tack Guiding principles of standard track. Lay out of 200 m Track and Lay out and maintenance of 400m Track.

References:-

1. Doherty, J., Manneth, Mudern Track and Field Engle wood Cliffs; N.J. Prientice Hall Inc.
2. Dyoon, Geoffray, G.H. The Mechanics of Athelitics London : University of London Press Ltd., 1962.
3. Ken O Bosen Track and Field Fundamental Techniques, MS Publicationm Patiala.
4. Handbook, AAFI, New Delhi.
5. Prabakhar Eric., The way to Atheletic Gold Delhi, Affiliated Eastt - West Press Privated Ltd., 1995.
6. Rogres, L. Joseph., USA Track & Field Coaching Manual USA: Herman Kinetics.

Major Elective - SPORTS NUTRITION

Unit I	Meaning Need, Nature and Importance of Nutrition Role of Nutrition on Higher Performance in sports
Unit II	Basics of Nutrition, Carbohydrates, Fats, Proteins, Vitamins, Minerals, Water, Balanced diet, Nutritive value of Food stuffs.
Unit III	Nutrition for Athletes and players, Energy requirements in Sports, Carbohydrate in loading.
nit IV	Percentage of energy derived from foods, Glycemic Index of food, Dietary fiber of food. Nutritive value of food stuffs.
Unit V	Principles of weight control, Exercise. The Key to successful weight loss management designing weight loss programme. Tips for control body weight.

References:-

1. Pande P.K. and L.C. Gupta, Putline of Sports Medicine : Jaypee Brothers, New Delhi, 1987.
2. Hoeger W.K. Werner and Sharon A. Hoeger, Fitness and Welness : Mortor Publishing Company, Englewood, 1990.
3. Goswami Shashikant, Nutrition for sports, SAINSNIS, Patiala, 1996.

Major Elective--EXERCISE PHYSIOLOGY

- Unit I** Proportion and Structure of muscle - Structure of muscle - fiber - filament model of contraction - muscular theory of contraction - Muscular fatigue.
- Unit II** Effect of exercise on various systems of the body - Energy Release -Aerobic metabolism - Anaerobic metabolism - The motor neuron - The synapse - The action potential - Transmission of the nervous impulse
- Unit III** Oxygen and Carbon dioxide Transport - Gas exchange - Respiration - lung volume mechanism of breathing - Effect of exercise on pulmonary ventilation _ Intra pulmonary pressure – Intra plural pressure - Reflex regulation of respiration.
- Unit IV** Heart and Circulation - Effect of exercise on cardiac output - Effect of exercise on muscle blood flow - Cardiac cycle - Cardiac output -Cardiac index - Stroke volume - Nervous and Chemical control of the heart.
- Unit V** Physiological aspect of exercise and sports - Concept of physical fitness and physical training - Physiological aspects of developments of basic motor qualities like strength, speed, endurance, flexibility and co ordination - Work capacity under different environmental condition - hot cold, humid, high altitude - Effect of alcohol, drugs and smoking on athletic performance - Exercise and weight control.

References:-

1. Gresyton Ac. text book of Medical Physiology, W,B, Saunder Company, Philodelphia.
2. Karporich P.V. and Sinning W.B. - Physiology of muscular activity.
3. D.E. Vries H.A. - Physiology for physical Education and Athletics. Strape press, London. 1976.

Skill Based - III - BIO – MECHANICS IN SPORTS

- Unit I** Meaning, Aim and Objectives, Importance of biomechanics in sports
Types of motion Linear, Angular, curvilinear and circular motion
- Unit II** Linear Kinematics: Speed, Velocity, Acceleration, Motion, Projectile motion. - Application of Linear Kinematics in the field of Physical Education and Sports
- Unit III** Angular Kinematics : Angular Speed, Angular velocity, Angular acceleration, Relationship between Linear and Angular Motion- Application of angular Kinematics in the field of Physical Education and Sports

Unit IV Linear Kinetics: Mass, Weight, Force, Pressure, Work, Power, Energy, Impulse, Momentum, Impact, Friction, Newton's Law of motion. Law of Inertia and types of inertia

Unit V Angular Kinetics: Levers, Equilibrium, and Centre of Gravity- Friction and its types, centrifugal and centripetal force Bio mechanical principles involved in designing sports equipments

References:-

1. Miller and Nelman, "Biomechanics of Sports, Philadelphia Lee and Fibier, 1972.
2. Hay, James G. Biomechanics of Sports Techniques, Prentice Hall Inc., USA, 1993.
3. Hall Susan, Basic Biomechanics: Msoby St, Louis, 1991.

Core Practical III

Major Games (Specialization)

Basketball, Cricket, Football, Hockey, Volleyball

(Carry Over Practical)

Core Practical IV

TRACK AND FIELD

(Carry Over Practical)

Core Practical V

PHYSIOTHERAPHY

(Carry Over Practical)

VI Semester

Core IX - TEST AND MEASUREMENT IN PHYSICAL EDUCATION

- Unit I** Meaning of Test, Measurement and Evaluation. History of Test, Measurement and Evaluation, Need and importance of Test, measurement and Evaluation.
- Unit II** Classification of test- Sports Knowledge test- Purpose of knowledge test- classification of knowledge test- Standardised and Teacher made test- Skill test classification- Objective test- subjective test- qualities of the test- Administration of the test- Advance preparation- Duties during testing - Duties after testing
- Unit III** Criteria of test selection-Validity, reliability, Objectivity, Norms, Administrative feasibility- Strength test – Bend knee sit ups test. Flexibility test – Sit and reach test- Speed test – 50 mts run- Cardio respiratory Endurance Cooper 12 minute Run / Walk test.-Explosive strength test – Standing Broad Jump
- Unit IV** Definition - Health related fitness - Skill related Physical fitness.
AAHPERD Youth Fitness test. . Motor fitness –JCR test
Barrow motor ability test. Harward step test
Karws weber test. Margaria –Kalamen power test
- Unit V** Test of Specific sport skills.
Basketball test- Johnson Basketball Ability test – Knox Basket Ball test.
Hockey Chapman Ball Control test in Hockey.
Soccer -McDonald Volleying Soccer Test.-
Volley ball Helmen Volley ball test
Modified Brady Volley Ball Test.
Badminton French Short Serve Test.
Tennis - Broer - Miller Tennis Test.

References :-

1. Safrit Margarat J. "Measurement in Physical Education and Exercise Science". St. Louis, Times Mirror Mosby College publishing, 1986.
2. Bosco, James S. "Measurement and Evaluation in physical Education and Sports", New Jersey, Prentice Hall Inc., 1983.
3. Clarke H. "Application of measurement in Health and Physical Education, Pretice Hall Inc., 1967.
4. Mathews K. Donald, "Measurement in Physical Education" London W.S. Saunders Company, 1973.

Core X - PRINIPICLES OF SPORTS TRANING

- Unit I** Introduction - Meaning and Definition of Sports Training -Aim -characteristics- Principles of Sports Training-
- Unit II** Training Load –Types of Load – Components of Load- Judgment of Load- Adaptation - Relationships between Load and Adaptation. Over load- Causes, Symptoms and Remedies.
- Unit III** Training of motor qualities –
- Strength -Forms of strength – Factors determining strength- Methods to improve strength – Speed - Forms of strength – Factors determining Speed- Methods to improve Speed – Endurance -Forms of Endurance – factors determining Endurance- Methods to improve Endurance
- Unit IV** Flexibility - Forms of flexibility – Factors determining flexibility- Methods to improve flexibility - Coordination - Forms of Coordination – Factors determining coordination - Methods to improve coordination. Various Types of Trainings - Plyometric training, Weight training, Resistance training- meaning and its role on development of the motor fitness
- Unit V** Training plan- Periodisation- Stages of Periodisation- Types of Periodisation - Preparatory period -competition period - Transitional period- long term and Short term plans - Cyclic process of training. Technical preparation - Aims to techniques in sports- Fundamentals and methods for development of technique in sports - Tactical preparation- Aims of Tactics- Methods of tactical development.

References :-

1. J. Bunn Scientific Principles of coaching -.
2. Hardayal Singh.Sports Training:
3. Dr M.Elango, M.Kandasamy,P.Sivagnanam Fundamentals of Sports Training

Core XI - SPORTS PHYSIOTHERAPY

- Unit I** Meaning, Nature, Need and Importance of Physiotherapy
- Unit II** Electricity and Conductor, Short wave diathermy, Microwave diathermy, Diapulse Diathermy, Ultra Sound Waves, Infra red rays, Ultra violent rays - Sources - Effect and uses - Techniques for infra red and ultra violet irradiation.
- Unit III** Massage Therapy
- Brief History of Massage, Points to be considered in giving massage, classification of the Manipulations used in massage. The Technique, the Effect, uses, Indication and contra- Indications of all manipulations.
- Unit IV** Rheumatic Conditions
1. Classification – Rheumatoid Arthritis
 2. Spondylitis
 3. Acute respiratory conditions

4. Chronic respiratory conditions
5. Conditions of the Nervous System.

Introduction, Sign and Symptoms of neurological dis-orders like Paraplegia, Hemiplegia, Cerebral Palsy. Various infections of the Nervous System-Meningites, Poliomyetetis, cerebral palsy.

Unit V

Conditions of the cardio vascular system

1. Introduction, heart failure, classification carelitis.-Sign and symptoms and prevention.
2. Chronic vascular disorders, coronary occlusion and Efforts requiring hypertension.
3. Disorders of the blood vessels- Atherosilerosis, cold extremities, various thrombosis
4. Fracture of the upper extremity and lower extremity
5. Dislocation

References:

- 1) Joan, N. Laan, "Physitharaphy in Medical Conditions"
- 2) Thorndike, "Atheletic Injuries"
- 3) Joan, "Physiotharaphy in Surgical conditions"
- 4) Henry, C. Kondal and Fiorence P. Kondal, Muscle and Funtions.
- 5) I.B. Clayton, "Text Book of Electroherephy" and Actiontheraphy
- 6) Branda Savage, "Preliminary electricity for the Physiotharapist"
- 7) Edwin M. Prasnet, "Manual of Massage and Movements"
- 8) R. Foracks, "Exercise Theraphy"
- 9) M.V.Locs, "Manual of Massages"
- 10) Adish Luchwald, "Physical Rehabilitation for Daily Living"

Major Elective- SPORTS JOURNALISM AND MASS COMUNICATION

Unit I

Sports Journalism - Meaning, Need, Nature and Scope,

Aim and Objectives of Mass Communication.

Purpose of mass media for the propagation of sports and games

Growth of sports communication and periodicals

Sports courage

Sports courage on AIR, T.V and Films

Unit II

Basic Principles of sports reporting.

Difference between general news reporting and Sport reporting

Source of sports news, Sports spot news

Advanced story and flash back

Follow up story
Basic of Athletic reporting,
Basics of Games Reporting,
Interviews, Photos, News, Tit-bits.

Unit III Editing - Techniques
Editor - Sub Editors
Copy reading and handling sports news
Design and makeup of the sports page
Typography and various process of printing
News paper styles and slant
News Structure

Unit IV Radio & TV Commentary.
Differences between Radio & TV Commentary.
Experts comments
Sports reviews for the radio and T.V

Unit V Advertising and Newspaper Management.
Radio and T.V Advertising
News paper organization and management of news paper circulation
Ethics and Responsibilities of Sport Journalists.

References :-

1. Gurusamy, Ithazial Kalai, Dindigul : Guru - Themozhi, 2001.
2. Ahuja A.N., Theory and Practice of Journalism, Surject Publication, New Delhi, 1984.
3. Kamath, M.V., Professional Journalism, Vikas Publishing House Ltd., New Delhi, 1981.
4. Puri G.K., 'Journalism, Sudha Publication, Pvt., Ltd., New Delhi.

Core Practical III
MAJOR GAMES (Specialization)

Unit I

General and Specific Conditioning Exercises

Unit II

Fundamental Skills (Offensive Skills, Defensive Skills)

Unit III

Techniques and Tactics

Unit IV

Lead up games and System of Play

Unit V

Method of Officiating Play field, Equipment specifications and Scoring

Core Practical IV
TRACK AND FIELD

Unit I

Warming up: General and Specific Exercises

Unit II

Techniques in Sprints Middle Distance Long Distance Hurdles and Relay Races

Unit III

Techniques in Jumps Long Jump, Triple Jump, High Jump, Pole Vault

Unit IV

Techniques in, Shot Put, Discus Throw, Javelin Throw, Hammer Throw

Unit V

Officiating, Rules and Regulations Play field, Equipment specifications and Scoring

Core Practical V
PHYSIOTHERAPY

Unit I

Actino Therapy - Infra Red Radiation

- a) How to give the Infra red Radiation
- b) Techniques for Infra red Radiation
- c) Indication of Infra red Radiation
- d) Contra Indication Infra red Radiation
- e) Complications of Infra red Radiation

Unit II

Massage Therapy

- a) How to give general Massage
- b) General Massage Technique
- c) Effects of sports Massage
- d) Correct use of sports Massage
- e) Contra indication of sports Massage
- f) Cardiac Massage
- g) Abdominal Massage

Unit III

Exercise Therapy

- a) Basic Principles of Exercise Therapy
- b) Purpose of Exercise Therapy
- c) Types of Exercise Therapy
- d) Instruments used for Exercise Therapy
 1. Tacment Bar
 2. Abdominal Bench Press
 3. Overhead Lateral Pully
 4. Leg Press

Unit IV

A. Respiratory System

How to Examine the Patients Suffering from Respiratory disease

- a) Inspection
- b) Palpation
- c) Auscultation
- d) Percussion

B. Cardio-Vascular System

- a) Inspection
- b) Palpation
- c) Auscultation
- d) Percussion

How to measure the Blood Pressure

How to use the Treadmill for Cardio-vascular patients

Unit V

Nervous System

How to Examine the Patients Suffering from Nervous system

- a) Carnial Nerve Examination
- b) Motor system examination
- c) Sensory system examination
- d) Reflexes
 - i) Superficial Reflexes
 - ii) Deep Reflexes

APPENDIX – AZ56

Manonmaniam Sundaranar University, Tirunelveli

B.Sc Nutrition & Dietetics

(For there who joined the course from the academic year 2012-2013 onwards)

Semester - III			
	Components	Hours	Credits
Part I	Tamil/ other Language (1 course)	6	3
Part II	English (1 course)	6	3
Part III	Core Subjects (2 courses 1T + 1P) Nutrition through Life Cycle	4 2	4
	Allied Subject (1 course) Food Microbiology	4 2	4
Part – IV	skill based subject (1 course) Food Service Management I Non Major (elective) Food Microbiology - I/ Principles of Interior Decoration I	4 2	4 2
Total	(5T + 2P Courses)	30	20

Semester – IV			
	Components	Hours	Credits
Part I	Tamil/ other Language (1 course)	6	3
Part II	English (1 course)	6	3
Part III	Core Subjects (2 courses)(1T + 1P) Food Chemistry	4 2	4 2
	Allied Subject (1 course) Food processing and Preservation	4 2	4 2
Part – IV	Skill based subject (1 course) Food Service Management II Non Major (Elective) 1 Course Food Microbiology - II Principles Of Interior Decoration II	4 2	4 2
PART V	Extension activity (NCC, NSS,YRC,YWF)		1
Total		30	25

Practicals :

1. Nutrition through life cycle
2. Food Microbiology & Food Processing & Preservation

Semester –V			
	Components	Hours	Credits
Part III	Core Subjects (2T + 2P) courses		
	Dietetics I	4	8
	Baking and Confectionary	3	
		4	
	3		
	Major Elective (2 courses)		
	Family Resource Management I	5	10
		2	
	Functional Foods		
Nutraceuticals	5		
	Fundamental of textiles and clothing		
Part – IV	Skilled Based Subject (Common)	4	4
Total	(5T + 3P Practical Courses)	30	22

Semester VI			
	Components	Hours	Credits
Part III	Core Subjects (2 course) (1T + 1P)		
	Clinical BioChemistry	6	8
		3	
	Baking and Confectionary II	5	8
	2		
	Dietetics II	6	8
		3	
	Major – elective (1 course)		
	Family Resource Management– II / Food Packaging	5	5
Total	(4T + 3P Courses)	30	29

Practicals :

1. Clinical biochemistry, 2. Food Chemistry, 3. Dietetics

Total no.of. Courses = 40 (33T + 7 P)

Total no.of.Hours = 180

Total no.of Credits = 140

Distribution of Marks	Internal	External
Theory	75	25
Practical	60	40
Pass Minimum	40%	

SEMESTER - III
CORE PAPER - V
NUTRITION THROUGHOUT LIFE CYCLE

Objectives:

- a. To help students to understand the basis of meal planning.
- b. To obtain knowledge on various nutritional deficiency disorders.
- c. To understand the nutritional needs of members at different age levels.

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	<p>Requirements for infancy and preschool age:</p> <p>a) Infancy – Growth and development, nutritional requirements, breast feeding, weaning practices, diet supplements</p> <p>b) Pre school age – nutritional requirements, factors affecting nutritional status, problem related to nutrition</p>	<p>Menu planning, preparation and evaluation for preschool child.</p> <p>Visit to balwadi</p>	Lecture, preparation of chart for supplementary foods
II	<p><u>Balanced diets for school going children and adolescence:</u></p> <p>a) Balanced diet – meaning, basic principles meal planning</p> <p>b) Planning meals for different socio economic conditions – low income, middle income & high income groups</p> <p>c) School age – nutritional requirements, food requirements, packed lunches, school lunch programmes</p> <p>d) Adolescence – Nutritional requirements, food habits, fast food, nutritional problems</p>	<p>Menu planning, preparation and evaluation for school age adolescence period</p> <p>Visit to ICDS</p>	Lecture, group discussion, assignment preparation
III	<p>Balanced diets for adults, pregnant, lactating mother</p> <p>Adult – nutritional requirements, food requirements, principles involved in planning of meals.</p>	<p>Menu planning, preparation and evaluation for pregnant women, lactating mother and old age</p>	Lecture, demonstration on low cost nutritious food, quiz programme

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
	<p>Pregnant woman – Physical changes, nutritional requirements, food requirements, problems related to nutrition, during pregnancy complications & dietary problems</p> <p>Lactating mothers – nutritional requirements, food management</p> <p>Geriatric Nutrition – Process of aging, physiological and biochemical changes, considerations in feeding elderly</p>		
IV	<p>Diet Modification:</p> <p>Definition – importance – modification of normal diet – clear fluid – full fluid & soft diet.</p> <p>Tube feeding, parenteral feeding.</p> <p>Pre and post operative diets</p>	<p>Visit to hospital to see tube feeding and parenteral feeding</p>	<p>Lecture, Use of OHP</p>
V	<p>Diet for Deficiency conditions:</p> <p>a. Nutritional deficiency diseases – PEM, Vitamin A and Anaemia</p> <p>b. Lactose intolerance, phenyl ketonuria, alkaptonuria, galactossemia and sickle cell anaemia</p>	<p>Visit to school to observe deficiency diseases, menu planning for PEM, Vitamin A deficiency and Anaemic person</p>	<p>Lecture, assignment presentation, preparing spotters for deficiency diseases</p>

References:

1. Sri Lakshmi (2004) Dietetics, Wiley Eastern publishers.
2. Corrine Robinson (1990) Normal and Therapeutic Nutrition, Oxford and IBH publishers.
3. Swaminathan. M. (2003) Principles of Nutrition and Dietetics, Bappco publishers, Bangalore.
4. Gopalan Etal., (1996) Nutritive value of Indian food, NIN publication, Hyderabad.
5. Bhavana sabarwal (1999) principles and practices of Dietetics, Ajay verma common wealth publishers, New Delhi.
6. Davidson Passmore (1989) Human Nutrition and Dietetics, London Churchill and Livingston publishers.

**ALLIED SUBJECT
FOOD MICROBIOLOGY**

Objectives :

- To instruct students who are having their first experience with microbiology on the nature of micro organism
- To outline the source of contamination and their aspects of foods
- To understand the principles of food preservation
- To gain knowledge of the methods to prevent contamination

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	General characteristics: General characteristics of main group of microorganisms – Bacteria, fungi, yeast.	Identify some micro organisms	Lecture, Demonstration
II	Microorganisms of soil, water, sewage & atmosphere: Soil – Nitrogen cycle, carbon cycle, sulphur cycle & Phosphorus cycle Water – methods of water purification, types of microorganisms Sewage – Sewage treatment methods, types of microorganisms Air – microbial pollution Control measures	Visit to sewage treatment plant	Lecture use of OHP using charts
III	Contamination of Cereals and cereals products: Contamination and prevention of spoilage of cereals and cereals products Contamination and prevention of spoilage of vegetables and fruits	Observe & note the spoilage in fruits and vegetable	Lecture, group discussion
IV	Contamination of milk, fish, meats : a. Contamination and prevention of spoilage of milk and milk product b. Contamination and prevention of spoilage of meats, fish and other sea foods	Observe and note the spoilage in milk and fish	Lecture, assignment presentation
V	Contamination of eggs and poultry: Contamination and prevention of spoilage of eggs Contamination and prevention of spoilage of poultry	Observe and note the spoilage in egg and poultry	Lecture, conducting quiz, group discussion

Selected References:

- Joshua. A.K. Microbiology, India printing works
- Martein Probisher, Fundamentals of micro-biology
- Goss, R.C., Experimental Microbiology. Guide laboratory, Kalyani publishers
- Frazier, W.C. Food Microbiology, Tata Mc. Graw Hill Book Company, Bombay, 1988
- Adams, M.R and Moss M.O. Food Microbiology Royal Society of Chemistry, Cambridge, 1995
- Banwart, G.T, Baric Food Microbiology CSS Publishers, New Delhi. 1987

**SKILL BASED SUBJECTS
FOOD SERVICE MANAGEMENT - I**

OBJECTIVES :

1. Gain knowledge about various types of food service.
2. Understand the principles and functions of management.
3. Realise the importance of sanitation.

UNITS	TOPIC AND CONTENT	PRACTICAL/ RELATED EXPERIENCE / VISIT	TEACHING METHOD
UNIT -1	ORIGIN OF RESTAURANT : Origin of restaurant and commercial food services, Types of institutional food service operation.	Visit to star hotels	Lecture Assignment Seminar
UNIT-2	MANAGEMENT PROCESS : Management and organization - Definition, principles and tools of management	Visit to catering institutions to know about its organization	Lecture Assignment Seminar
UNIT-3	PERSONNEL MANAGEMENT : Recruitment, selection, orientation, training, motivation and supervision.		Lecture Assignment Seminar
UNIT-4	FINANCIAL MANAGEMENT: Book keeping, account maintains, balance sheet	Comparison of cost of different types of hotels	Lecture Assignment Seminar
UNIT-5	HYGIENE AND SANITATION : Definition and importance of hygiene and sanitation in food handling, personal hygiene, pest and rodent control in food service institutions, Causes and prevention of accidents and safety education.	Maintaining hygiene and sanitation in the work place	Lecture Assignment Seminar

REFERENCES :

1. Mohini Sethi and – Surjeet Malhan.
2. Catering Management an integrated approach Wiley Eastern Ltd., New Delhi.
3. Malhotra – Food Service Management – Anmol Publisher, New Delhi.
4. The theory of catering, Kinton and Ceasarani.

**NON-MAJOR ELECTIVE
FOOD MICROBIOLOGY - I**

Objectives :

- To instruct students who are having their first experience with microbiology on the nature of micro organism
- To outline the source of contamination and their aspects of foods
- To understand the principles of food preservation
- To gain knowledge of the methods to prevent contamination

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	General characteristics: General characteristics of main group of microorganisms – Bacteria, fungi, yeast.	Identify some micro organisms	Lecture, Demonstration
II	Micro organisms of soil, water, Sewage & atmosphere: Soil – Nitrogen cycle, carbon cycle, sulphur cycle & Phosphorus cycle Water – methods of water purification, types of microorganisms Sewage – Sewage treatment methods, types of microorganisms Air – microbial pollution Control measures	Visit to sewage treatment plant	Lecture use of OHP using charts
III	Methods of Food preservation :- Bacteriostatic, dehydration pickling salting, sun drying, smoking, freezing mechanical drying, salt & sugar, oil & spices, Acids, Low temperature, High Temperature, Bactericidal – canning, cooking and irradiation.	Pickle making	Lecture Assignment Seminar
IV	Use of preservatives : Chemical preservative, Food additives, ideal Anti – microbial preservation, added preservative, developed preservative	Identification of preservatives	Lecture Assignment Seminar
V	Sterilization & disinfection : Sterilization : Physical agents – lights desiccation, Electricity and heat. Chemical agents removal of micro organisms and filtration.		Lecture Assignment Seminar

References:

- Joshua. A.K. Microbiology, India printing works
- Martein Probisher, Fundamentals of micro-biology
- Goss, R.C., Experimental Microbiology. Guide laboratory, Kalyani publishers
- Frazier, W.C. Food Microbiology, Tata Mc. Graw Hill Book Company, Bombay, 1988
- Adams, M.R and Moss M.O. Food Microbiology Royal Society of Chemistry, Cambridge, 1995
- Banwart, G.T, Baric Food Microbiology CSS Publishers, New Delhi. 1987

PRINCIPLES OF INTERIOR DECORATION - I**OBJECTIVES :**

1. To learn the basic principles of art.
2. To develop the skill of applying the principles of art in decorating the house.

UNITS	TOPIC AND CONTENT	PRACTICAL/ RELATED EXPERIENCE / VISIT	TEACHING METHOD
UNIT -1	FAMILY HOUSING : Need and importance of Housing. Factors influencing selection of site. Factors to be considered for good housing, Ventilation.	Visit different types of housing	Lecture Assignment Seminar
UNIT-2	ELEMENTS OF DESIGN : Design – Definition – Kinds of design. Elements of design line – Direction – Shape, Size, Texture and colour	Create the elements of design in a greeting card.	Lecture Assignment Seminar
UNIT-3	PRINCIPLES OF DESIGN : Harmony, Balance, Rhythm, Proportion, Emphasis.	Prepare different models using the principles of design	Lecture Assignment Seminar
UNIT-4	USE OF COLOUR IN INTERIOR : Classifications of colours – primary, binary, intermediate, tertiary and quaternary. Qualities of colour, Hue value, intensity, Prang colour system, colour and emotion, use of colour in interior decoration.	Colour chart, types of colour and colour in interior decoration.	Lecture Assignment Seminar
UNIT-5	Furniture selection : Care \and selection of furniture in dinning room, office, bed room, living room.		Lecture Assignment Seminar

REFERENCES:

1. Nickel, P. and Dorsey, J.M. – Management in Family living, Tohn Wiley and sons, Inc, New York (1986).
2. Varghese and Oglae, Home management, wiley Easter Ltd., New Delhi (1994).
3. Butt, H.H., Home Furnishings, John Wiley and sons, New York, 1971.

**SEMESTER - IV
CORE PAPER - VI**

FOOD CHEMISTRY

Objectives :

1. Understand the meaning and chemical preparation of carbohydrates in foods
2. Explain the role of lipids and protein in foods
3. Acquire knowledge on the chemical changes occurring in foods

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	Carbohydrates in food: a) Introduction to food chemistry, b) Monosaccharides- structure, properties & derivatives c) Oligosaccharides- structure, properties & derivatives	Evaluation of food grains for their character	Lecture, group discussion, use of charts in classification
II	Carbohydrates in food: a) Functions of sugars in foods b) Polysaccharides and their role in foods	Qualitative test for carbohydrate Estimation of reducing sugar	Lecture, assignment presentation, guest lecture
III	Lipids in food a) classification and composition b) characteristics of fat c) functional properties		Lecture, assignment presentation, guest lecture
IV	<u>Functional role of proteins</u> a) Denaturation of proteins, b) foam formation of proteins, c) functional role in foods		Lecture, assignment presentation, guest lecture
V	<u>Functional role of vitamins and minerals</u> Vitamins and minerals – Functional role in foods and its bioavailability		Lecture, assignment, presentation, quiz competition

References:

1. Seema Yadav, 1997, Food Chemistry, Anmol Publications Pvt. Ltd, New Delhi
2. Meyer. L.H, Food Chemistry
3. Srilakshmi. B, 2002, Food Science, New Age International (P) Ltd, New Delhi
4. Shankuntala Manay, 2001, Food Principles, New Age International (P) Ltd, New Delhi

**ALLIED SUBJECT
FOOD PROCESSING AND PRESERVATION**

Objectives :

1. To understand the principles of food preservation
2. To develop skills for setting up production units

Unit – I

Objectives and principles of food preservation

Unit – II

- a) Low temperature - refrigeration, freezing
- b) High temperature – canning, dehydration, drying

Unit –III

Preservation by use of chemicals – preparation of crush, squashes, synthetic syrup

Unit –IV

Preservation by use of sugar – Jam, Jelly, Marmalade, Tuity-fruity

Unit – V

Pickling – Principles and methods

**SKILL BASED SUBJECT
FOOD SERVICE MANAGEMENT - II**

OBJECTIVES :

1. Gain knowledge about various types of food service.
2. Understand the principles and functions of management.
3. Realise the importance of sanitation.

UNITS	TOPIC AND CONTENT	PRACTICAL/ RELATED EXPERIENCE / VISIT	TEACHING METHOD
UNIT -1	CLASSIFICATION : Types of food service-system conventional, ready prepared and assembly service system, Styles of services, self services, tray services, waiter services, vending, mobile and portal services.	Visit to star hotels	Lecture Assignment Seminar
UNIT-2	MENU PLANNING AND PURCHASING : Menu – Types of menu, principles involved in menu techniques in writing, presenting a menu.	Planning menus according to income levels.	Lecture Assignment Seminar

	Purchasing and receiving procedure – Purchase specifications and procedure involved in receiving, standard practices.		
UNIT-3	QUANTITY AND QUALITY CONTROL: Quantity food production, standardization of recipes, quality standard and portion control, utilization of left overs.		Lecture Assignment Seminar
UNIT-4	EQUIPMENT AND STORAGE: Equipment and base materials, classification, selection, care and maintenance of equipments	Gaining practices and experience of the equipment of their care.	Lecture Assignment Seminar
UNIT-5	Food Storage – food storage objectives, types records maintained, storage procedures, other activities and inventory control.		Lecture Assignment Seminar

REFERENCES :

1. Mohini Sethi and – Surjeet Malhan.
2. Catering Management an integrated approach Wiley Eastern Ltd., New Delhi.
3. Malhotra – Food Service Management – Anmol Publisher, New Delhi.
4. The theory of catering, Kinton and Ceasarani.

**NON-MAJOR ELECTIVE
FOOD MICROBIOLOGY - II**

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	Cereals and cereals products : Contamination and prevention of spoilage of cereals and cereals products	Observe & note the spoilage in Cereals and Pulses	Lecture, group discussion
II	Fruits & Vegetables : Contamination and prevention of spoilage of vegetables and fruits	Observe & note the spoilage in fruits and vegetable	Lecture, group discussion
III	Contamination of milk: Contamination and prevention of spoilage of milk and milk product	Observe and note the spoilage in milk	Lecture, assignment presentation
IV	Contamination of fish, meats : Contamination and prevention of spoilage of meats, fish and other sea foods	Observe and note the spoilage in fish	Lecture, assignment presentation

V	Contamination of eggs and poultry: Contamination and prevention of spoilage of eggs Contamination and prevention of spoilage of poultry	Observe and note the spoilage in egg and poultry	Lecture, conducting quiz, group discussion
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References:

- Joshua. A.K. Microbiology, India printing works
- Martein Probisher, Fundamentals of micro-biology
- Goss, R.C., Experimental Microbiology. Guide laboratory, Kalyani publishers
- Frazier, W.C. Food Microbiology, Tata Mc. Graw Hill Book Company, Bombay, 1988
- Adams, M.R and Moss M.O. Food Microbiology Royal Society of Chemistry, Cambridge, 1995
- Banwart, G.T, Baric Food Microbiology CSS Publishers, New Delhi. 1987

PRINCIPLES OF INTERIOR DECORATION - II

OBJECTIVES :

1. To learn the basic principles of art.
2. To develop the skill of applying the principles of art in decorating the house.

UNITS	TOPIC AND CONTENT	PRACTICAL/ RELATED EXPERIENCE / VISIT	TEACHING METHOD
UNIT -1	Furnishings – selection use and care. Draperies and curtains, floor coverings. Hanging Pictures. Table settings.		Lecture Assignment Seminar
UNIT-2	Flower Arrangement : Requirement of flower arrangement. Treatment of flower styles in flower arrangement (traditional oriental and modern) Types of flower arrangement. Steps in making flower arrangement	Flower arrangement different types	Lecture Assignment Seminar
UNIT-3	House Hold Equipments and Cleaning: Study about various house hold equipments. Need for house hold cleaning. Reagents, Equipments, Methods of cleaning. Principles followed in cleaning. Furniture cleaning and polishing, care doing cleaning.	Identify different cleaning and polishing materials	Lecture Assignment Seminar
UNIT-4	Household Pests : Common house hold pests mode of infection, methods of eradication, pest control common natural and artificial pesticides.	Identify different pests, comment different pesticides.	Lecture Assignment Seminar
UNIT-5	Illumination :		Lecture Assignment Seminar

REFERENCES :

1. Nickel, P. and Dorsey, J.M. - Management in Family living, Tohn Wiley and Sons, Inc., New York (1986).
2. Varghese and Oglae, Home management, Wiley Easter Ltd., New Delhi (1994).
3. Butt, H.H., Home Furnishings, John Wiley and Sons, New York, 1971.

PRACTICALS

1. Major - Nutrition through life cycle
2. Allied - Food Micro biology and Food preservation

**SEMESTER-V
CORE PAPER - VII
DIETETICS - I**

Objectives :

1. To gain insight into the national nutritional problems and their implications
2. To obtain knowledge about the methods of assessment of nutritional status
3. Develop skills in organizing and evaluating nutrition projects in the community

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	Diseases of GIT Diet in diseases of the digestive tract – peptic ulcer, diarrhea and constipation.	Menu planning, Preparation and evaluation of peptic ulcer, hepatitis and Cirrhosis	Lecture Group discussion
II	Diet in diseases of the liver and biliary tract – hepatitis, cirrhosis, gall bladder diseases		
III	Febrile and Diabetes Mellitus Diet in Febrile conditions, causes, types, metabolic changes, diet modification in Influenza, Malaria, typhoid, tuberculosis	Menu planning, Preparation and evaluation of typhoid, tuberculosis,	Lecture
IV	Diet in Diabetes Mellitus – etiology, changes in metabolism, clinical symptoms, methods of treatment- diet, drug, complications and Food Exchange list	Diabetes Mellitus	Preparation of food exchange list for diabetes

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
V	Cardiac disorders : Diet in Cardiac disorders: Atherosclerosis and hypertension, signs and symptoms, complications, diet modification	Menu planning, Preparation and evaluation of Atherosclerosis and hypertension	Lecture, guest lecture, seminar

References:

1. Sri Lakshmi (2004) Dietetics, Wiley Eastern publishers.
2. Corrine Robinson (1990) Normal and Therapeutic Nutrition, Oxford and IBH publishers.
3. Swaminathan. M. (2003) Principles of Nutrition and Dietetics, Bappco publishers, Bangalore.
4. Gopalan Etal., (1996) Nutritive value of Indian food, NIN publication, Hyderabad.
5. Bhavana sabarwal (1999) principles and practices of Dietetics, Ajay verma common wealth publishers, New Delhi.
6. Davidson Passmore (1989) Human Nutrition and Dietetics, London Churchill and Livingston publishers.

CORE PAPER - VIII

BAKERY AND CONFECTIONARY - I

OBJECTIVES :

1. Understand basic concept of baking.
2. Acquaint with the role of various major and minor ingredients in bakery products.
3. Familiarise with baking process and operation.
4. Learn the quality parameters of bakery products.

UNITS	TOPIC AND CONTENT	PRACTICAL/ RELATED EXPERIENCE / VISIT	TEACHING METHOD
UNIT -1	BAKERY : Wheat- type, principles of flour milling. Flour – types of flour, composition, quality assessment (Biscuit, cake, pastry, self-rising flour, whole wheat flour)	Identify different types of flour	Lecture Assignment Seminar
UNIT-2	OTHER INGREDIENTS AND THEIR FUNCTION IN BAKING : a) Yeast : types, function, uses effects of over and under fermentation. b) Eggs – Function in bakery. c) Sugar – Types uses.		Lecture Assignment Seminar

	d) Fats – Classification, function, effect of cooking. e) Milk and Milk products, emulsifiers, dried fruits & leaving agent. f) Water and salt (Baking soda)		
UNIT-3	BAKING PROCESS : Baking process – basic concepts, batch or continuous dough mixing, dividing, moulding, proofing, baking. Formation and expansion of gases. Trapping of gases in air cells coagulation of protein, gelatinization of starches, evaporation of water, melting of shortening, browning of the sugar.	Visit to a bakery unit. Preparation of Pizza	Lecture Assignment Seminar
UNIT-4	CAKES : Preparation of cake, different methods, icings, faults and remedies. Preparation of biscuits, cookies and its types.	Preparation of different types of cakes, biscuits, cookies and different icings.	Lecture Assignment Seminar
UNIT-5	BAKERY MACHINERY AND EQUIPMENT : Bakery machinery and equipments – bulk handling, mixers, forming, moulding, cuttings, embossing, ovens, packaging, auxiliary equipments.		Lecture Assignment Seminar

REFERENCES :

1. Kent.N.L. Technology of cereals – with special reference to wheat, pergamon Press, New York, USA, 1975.
2. Sultan.W.J. (1976): Practical baking manual – for students and instructors, AVI Publishing Co.INC, West Port, Connecticut.
3. Matz S.A. Technology for the materials of Baking- Eisevier Science Publishers, Barking, England.

MAJOR ELECTIVE

FAMILY RESOURCE MANAGEMENT – I

Objectives:

- To attain a thorough knowledge of understanding values and goals in house keeping
- To gain a basic knowledge of planning and constructing a house
- To understand a basic designs and art

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	<p>Housing</p> <p>Functions of the house and its environment</p> <p>House planning – site selection, factors to be considered, features of a house contributing to livability, orientation, grouping, roominess, lighting and ventilation, storage facility, privacy, flexibility, sanitation and economy</p> <p>Kitchen planning – different types – work triangle</p> <p>House plans – low, middle and high income groups</p>	Draw the house plan and kitchen plan	Using OHP, lecture, group discussion
II	<p>Care and maintenance of house</p> <p>a. Care and maintenance of house and its surroundings.</p> <p>b. Daily, weekly and periodical cleaning to keep the house in good condition.</p> <p>c. Insect and pest control – preventive and remedial measures to be adopted.</p>	Visit to hotels to obtain knowledge on interior decoration and housing keeping	Group discussion, assignment
III	<p>Design</p> <p>a. Elements of design, types of design, characteristics of a good design, principles of design</p> <p>b. Harmony – meaning, types – repetition, contrast, transition</p>	Demonstration of different designs	Guest lecture, assignment, group discussion
III	<p>c. Proportion – meaning – means of obtaining good proportion</p> <p>d. Balance – meaning – types and means of obtaining balance</p> <p>e. Emphasis – meaning – means of creating emphasis</p> <p>f. Rhythm – meaning – means of getting rhythm</p>		Assignment
IV	<p>Colour</p> <p>a. Qualities of colour – hue, value, intensity of colours and emotions, advancing and receding colours.</p> <p>b. How to use colours – proportion, balance, harmony, and rhythm in</p>	Demonstration on mixing colour	Group discussion

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
	colour. c. Use of colour in interior decoration		
V	Accessories, furniture, flower arrangement a. Selection, use and care of accessories, Picture and wall hangings, basic knowledge of flower arrangements – principles, types of flower arrangement. b) Selection and use of furniture – living room, bedroom and dining room – table setting.	Visit to flower show, demonstration on different types of flower arrangement, wall hangings, picture	Lecture, group discussion

References:

1. Desh Pande, R.S., Modern Ideal Homes for India – United Book Corporations, Poone – 1971.
2. Stella Soundararaj. A Textbook of House hold Arts, Orient Longmans, Bombay – 1968.
3. Margaret Kaye. A. A Students hand book of House wifery, J.M. Dent Sons Ltd., London.
4. Paulena Nickell, Jean Muir Dorsey – Management in Family Living, Wiley Eastern Private Ltd.

FUNCTIONAL FOODS AND NUTRACEUTICALS

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	<u>Functional foods and nutraceuticals</u> a) Introduction, definition, importance Health attributes of functional foods – Introduction, Health living Index provides information on healthy diet, fitness, emotional wellness	Formation of Pyramid	Lecture, assignment presentation
II	a) FFN and acute infection and probiotic – Probiotic immune system, sources of micro algal health supplements b) Probiotic functional food and treatment of GI disorders	Preparation of health supplements	Lecture, group discussion, demonstration

III	<p><u>Phytochemicals</u></p> <p>a) Introduction –Terpenoids, Polyphenolics, Anthocyanins, Isoflavones Silymarin, Tangeretin, Saponins</p> <p>b) other dominant phytochemicals</p>	Identification of different phytochemicals	Lecture, assignment presentation, Use of OHP
IV	<p>a) Other Nutraceuticals – PUFAs – Polyunsaturated fatty acid - Source ; natural constituents of animal and vegetable lipids, functions of PUFAs</p> <p>b) Functional foods in the control of aging, mood and performance, medical foods</p>	Collection and exhibits of medical foods	Group discussion, lecture
V	Colonic Functional Foods : Introduction to Colonic foods, Metabolism of colonic foods, Probiotics, Symbiotic, Health aspects of functional colonic foods, Host – microbe interaction.	Preparation of charts for cancer and food	Lecture, quiz competition, guest lecture

REFERENCE:

1. Mary K. Schimsl and Theodore P. Labuza; Essentials of functional foods 2000, Culinary and Hospitality industry Publication Services
2. C. Remacle and B. Reusens, Functional Foods, Aging and Degenerative Diseases, Culinary & Hospitality Publications Services.

FUNDAMENTAL OF TEXTILES AND CLOTHING.

OBJECTIVES:

1. To understand the characteristics & properties of textile fibers
2. To acquire thorough knowledge on fabric & yarn
3. To understand the construction of yarn and fabric.

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	a) <u>Fibres:</u> Definition, classification, general characteristics of cellulose, protein, thermoplastic and mineral fibres.		

	<p>b. <u>Major and minor textile fibres:</u> Manufacturing process, properties, use and care of textile fibres (eg) cotton, silk, rayon.</p> <p>c. Study of minor fibres jute, hemp, Coir.</p>		
II	<p>a. <u>Yarn construction:</u> Definition, twist, types and counts.</p> <p>b. <u>Fabric construction</u> Weaving-definition, Types of weaves - basic Weaves – plain, twill, satin and decorative Weaves (Jacquard weave).</p>		
III	<p>Fabric finishes – definition:</p> <p>a. Boiling, scouring, sizing, carbonizing, bleaching, shearing, singeing, calendaring, tendering, weighting, mercerizing.</p>		
Unit. No	Topic and content	Practical/ Related experience	Teaching methods
III	<p>a. Dyeing – initial dyeing – stock, yarn, piece, cross dyeing tie and dye, batik methods.</p> <p>b. Printing – types block, stencil, screen.</p> <p>c. Parts and function of sewing machines, use and care. - Tools for clothing construction. - Basic hand stitches. Temporary – basting-even, uneven, diagonal. Permanent – hemming, back stitch, whipping, overcasting, run stitch.</p> <p>d. Embroidery – stem, chain, cross, bullion, lazy – Daisy, fly, wheel, couching, blanket.</p>		
V	<p>SEAMS, NECK LINE, PLACKETS, GATHERS, FASTENERS, BIAS.</p> <p>a. Seams – definition, types.</p> <p>b. Bias – uses, types.</p> <p>c. Neck line – facing, binding, collar, peter pan collar.</p> <p>d. Fasteners – Types, uses &</p>		

	disadvantages. e. Plackets – uses, types. f. Garment Constructions Drafting – panty, A – line frock, six gore skirt, blouse		
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REFERENCES:

1. Fundamentals of textiles and their use. (Orient Longman Ltd.,)
2. Textiles fibres and their use – X.P. Hoss.
3. Household Textiles and laundry work Dankar.
4. Mary Mathew.
5. Clothing for modern – Macmillan & co.
6. Pattern drafting and making up – Bela Kapoor.

SEMESTER - VI

CORE PAPER - IX

CLINICAL BIOCHEMISTRY

Objectives:

1. To study different tests for diseases
2. To know the biochemical composition of bloods and different parts of the body

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	Blood Sugar Level of blood glucose in normal and abnormal conditions-Main tenancy of blood glucose level – Diabetes Mellitus – Types – Complication, Ketosis – Diabetic coma –	Visit to lab to observe the lists used for abnormal glucose level in blood	Lecture, Use of OHP
II	Inborn Errors of carbohydrate metabolism Pentosuria, Galactosemia Glucose Urea, Glycogen storage disease – Glucose tolerance test	Visit to lab to observe the lists used for abnormal glucose level in blood	Lecture, Use of OHP
III	Blood Lipids Types and level of lipids in blood disorder of lipoproteins – Determination of serum cholesterol – Hyper and Hypo Cholesterol, Atherosclerosis Inborn errors of fat metabolism.	A mini project related to heart diseases	Lecture, group discussion

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
IV	Plasma Protein: Plasma – Types – Functions an determination of total plasma proteins – inborn errors of amino acid metabolism – phenylke tonuria Albinism – Alkaptonuria and maple syrup disease	Conduct a survey to find out the prevalence of Inborn errors of metabolism	Lecture, Quiz programme
V	Gastric disorders Bile Salt – Functions, formation of bile acids and bile salts-bile pigments from haemoglobin	Visit to labs to observe liver and gastric test	Lecture, Use OHP, Use of other audio visuals

References :

1. Cantrow A and Trumper, Clinical Bio-Chemistry, M.W.B. Saunders co-1975.
2. Swaminathan, m. Bio-Chemistry for medical teachers.
3. Harold valley, Clinical, Bio-Chemistry (1986).
4. Saunder's C Clinical Bio-Chemistry.

CORE PAPER - X

BAKERY AND CONFECTIONARY - II

OBJECTIVES :

1. Understand basic concept of baking.
2. Acquaint with the role of various major and minor ingredients in bakery products.
3. Familiarise with baking process and operation.
4. Learn the quality parameters of bakery products.

UNITS	TOPIC AND CONTENT	PRACTICAL/ RELATED EXPERIENCE / VISIT	TEACHING METHOD
UNIT -1	Commercial bread making methods: Recent advances, chemical dough development, mechanical dough development, sheeting extrusion, other rapid methods. Methods of preparing bread and bread rolls. Evaluation of bread and quality control. Methods of preparation of pizza.	Bread making demonstration	Lecture Assignment Seminar
UNIT-2	Pastries – types, principles and working techniques- recipes for short cut pastry, puff pastry, sweet pastry, choux pastry,	Preparation of pizza	Lecture Assignment Seminar

	suet pastry. Reason for fault in the above preparation. Products made from the above pasteries.		
UNIT-3	Tarts – Tartlets – preparation and types Pies – types, mixing pie dough, pie crusts, procedure for making small fruit tart, assembling, baking and filling, common problems in fruit pies.	Preparation of different types of pies, sweet meats, chocolates – demonstration	Lecture Assignment Seminar
UNIT-4	Chocolate – manufacture and processing of chocolate, types and uses of chocolate, cocoa, butter, white chocolate, liquor chocolate, fondant chocolates and toffies		Lecture Assignment Seminar
UNIT-5	Microbial aspect of different bakery product : Prevention of bacterial rope and mold infection.		Lecture Assignment Seminar

REFERENCES :

1. Kent.N.L. Technology of cereals – with special reference to wheat, pergamon Press, New York, USA, 1975.
2. Sultan.W.J. (1976): Practical baking manual – for students and instructors, AVI Publishing Co.INC, West Port, Connecticut.
3. Matz S.A. Technology for the materials of Baking- Eisevier Science Publishers, Barking, England.

CORE PAPER - XI

DIETETICS - II

Objectives :

1. To gain insight into the national nutritional problems and their implications
2. To obtain knowledge about the methods of assessment of nutritional status
3. Develop skills in organizing and evaluating nutrition projects in the community

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	DIET IN FOOD ALLERGY- definition, classification, tests for allergy, diet modification		
II	Kidney diseases : Diet in Kidney disease: acute, chronic – glomerulonephritis, nephrosis, renal failure, urinary calculi, etiology, symptoms, diet modification.	Menu planning, Preparation and evaluation of glomerular nephritis, renal failure, urinary calculi	Lecture, quiz competitions assignment presentation

III	Burns : Diet in burns degrees of burns and diet management		Lecture, quiz competitions assignment presentation
IV	Obesity, Underweight : Diet in obesity & underweight – causes, methods of diagnosis, diet modifications	Menu planning, Preparation and evaluation of obesity & underweight	1. Lecture 2. Assignment presentation
V	Diet in Cancer – types, clinical symptoms, and dietary management.	Visit to hospitals for diet counseling	Group discussion

References:

1. Sri Lakshmi (2004) Dietetics, Wiley Eastern publishers.
2. Corrine Robinson (1990) Normal and Therapeutic Nutrition, Oxford and IBH publishers.
3. Swaminathan. M. (2003) Principles of Nutrition and Dietetics, Bappco publishers, Bangalore.
4. Gopalan Etal., (1996) Nutritive value of Indian food, NIN publication, Hyderabad.
5. Bhavana sabarwal (1999) principles and practices of Dietetics, Ajay verma common wealth publishers, New Delhi.
6. Davidson Passmore (1989) Human Nutrition and Dietetics, London Churchill and Livingston publishers.

MAJOR ELECTIVE

FAMILY RESOURCE MANAGEMENT – II

Objectives:

1. To enable the students to understand the importance of home management in family and personal living
2. To improve their ability in family resource management
3. To understand and apply basic principles of art in interior designing

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	Management: a. Definition and meaning of management – characteristics of a good home maker - management process – planning, organizing, controlling and evaluating b. Motivating factors in management – values, goals and standards. Decision making – steps in decision making	--	Lecture, using OHP, assignment, seminar

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
II	<p>Resources</p> <p>a. Resources – classification and characteristics</p> <p>b. Time and Energy Management – Importance of time management, guidelines in planning time schedule, fatigue - types and overcoming fatigue – work simplification – Mundel’s Law</p>	Work simplification techniques, time management	Group discussion, lecture
III	Standard of living – constituents – factors affecting, causes for low living standards in India.		Group discussion, lecture
IV	<p>Money Management</p> <p>Family Income – types, sources methods of augmenting family income.</p> <p>Family expenditure – budget – meaning – types of budget-planning a family budget – steps in planning, advantages of budgeting – Engel’s law of consumption</p> <p>Savings – meaning – need, saving institutions – Bank – Post office – Insurance – Chit fund – Unit trust of India</p>	<p>Steps in making the budget for a family various ways of improving the income of 10 family</p> <p>Visit to Banks and post offices</p>	<p>Seminar, group discussion, lecture, using OHP</p> <p>Guest lecture</p>
V	<p>Purchase pattern and consumer protection:</p> <p>b. The home maker as a wise consumer – rights of a consumer – consumer education –consumer aids – advertisement – standards-labels – price tag</p>	Cottage stay	Lecture, assignment, seminar
V	c. Consumer protection – need – measures adopted to provide consumer protection –consumer laws – consumer courts – consumer movement		

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
	d. Residence course – need, objectives planning, organisation and evaluation of the course – role of supervisor and staff adviser		

References:

1. Deshpande, R.S. Modern Ideal Homes for India – United Book corporations, Pune – 1971.
2. Paulena Nickell, Jean Muir Dorsey – Management in Family Living, Wiley Eastern Private Ltd.,
3. McCall's Editions – Mc Call's Decorating book – Random House, Mc calls.
4. Van Dommolen, D.B. Designing and Decorating Book – John Wiley & Son.
5. Mann, M (1980) home Management for Indian families, New Delhi Kalyan Publishers.

FOOD PACKAGING

Objectives :

This Course is designed to enable students to:

- Gain knowledge about various packaging materials and importance of packaging.
- Be familiar with testing and evaluation of packing media.
- Be familiar with packaging laws and regulations.
- Be able to select appropriate packaging material for a variety of foodstuffs vis-à-vis the need for preventing environment degradation.

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	a) Packaging – Concepts, Definition, Significance, Classification. b) Application in packaging	--	Lecture Group discussion
II	Primary Packaging Media – Properties and applications. Paper boards, metals, plastics, wood & plywood, glass, flexible, tin, aluminum can, foil. Labels, caps & closures & wads, adhesives, inks & lacquers, cushioning materials, reinforcements	Identify different packaging material	Guest lecture Lecture Seminar
III	Testing & evaluation of packing media – retail packs (including shelf life evaluation) and transport packages	Demonstration on evaluation of packing	Lecture Assignment presentation
IV	Packaging systems and methods for	Visit to packaging	Lecture

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
	food products – vacuum packaging, gas packaging, Aerosol packaging, Shrink packaging, Aseptic & retort packing, Bag-in Box, MAP, BOPP	centers	Assignment presentation Use of OHP
V	a) Storage, handling and distribution of packages (foods) – Effect of improper packaging – Preventive techniques. b) Branding and labeling. c) Packaging laws and regulations	Prepare labels and different packaging	Guest lecture Group discussion Seminar

References :

1. Sachrow & Griffin, Food Packing – AVI Publications.
2. Hotchikess Food & Packaging Interaction – American Chemical Society.
3. Darry, R. & T, Blackie: Principles & Applications of MAP – Academic & Professions.
4. Bhatia S.C. Canning & Preservations of Fruits & Vegetables – New Delhi, India.
5. Robertson G.L. Food Packaging – New York, Marcell Dekker, INC.
6. Bureau of G & Multon J.K. Food Packaging Technology (Vol.1 & 2) – VCH, Publishers, INC, New York.

APPENDIX - AZ57

Manonmaniam Sundaranar University, Tirunelveli BSc Food Science and Nutrition

(For there who joined the course from the academic year 2012-2013 onwards)

Semester - III			
	Components	Hours	Credits
Part I	Tamil/ other Language (1 course)	6	3
Part II	English (1 course)	6	3
Part III	Core Subjects (2 courses 1T + 1P) Essentials of macro nutrients	4 2	4
	Allied Subject (1 course) Family resource management-I	4 2	4
Part – IV	Skill based subject (1 course) Food Processing and Preservation Non Major (elective) Dietetics I	4 2	4 2
Total	(5T + 2P Courses)	30	20

Semester – IV			
	Components	Hours	Credits
Part I	Tamil/ other Language (1 course)	6	3
Part II	English (1 course)	6	3
Part III	Core Subjects (2 courses)(1T + 1P) Essentials of Micro Nutrients	4 2	4 2
	Allied Subject (1 course) Family resource management-II	4 2	4 2
Part – IV	Skill based subject (1 course) Fundamentals of Baking Non Major (Elective) 1 Course Dietetics II	4 2	4 2
PART V	Extension activity (NCC, NSS, YRC, YWF)		1
Total		30	25

Practicals: 1. Essentials of Macro & Micro Nutrients, 2. Family resource management

Semester –V			
	Components	Hours	Credits
Part III	Core Subjects (2T + 2P) courses		8
	Clinical Biochemistry	4	
		3	
	Food Packaging	4	
		3	
	Major Elective (2 courses)		10
	Food Micro Biology	5	
	Food Service Management	2	
	Hygiene and Sanitation	5	
Part – IV	Skilled Based Subject (Common)	4	4
Total	6 Courses	30	22

Semester VI			
	Components	Hours	Credits
Part III	Core Subjects (2 course) (1T + 1P)	6	8
	Nutrition Through Life Cycle	3	
	Food Chemistry	5	
		2	
			8
	Dietetics	6	8
		3	
	Major – elective (1 course)		5
	Textiles and Clothing	5	
Total	(4T + 3P Courses)	30	29

Practicals: 1. Nutrition through life cycle, 2. Food Chemistry, 3. Dietetics

Total no.of. Courses = 40 (33T + 7 P)

Total no.of.Hours = 180

Total no.of Credits = 140

Distribution of Marks Internal External

Theory 75 25

Practical 60 40

Pass Minimum 40%

SEMESTER III

CORE PAPER - V ESSENTIALS OF MACRO NUTRIENTS

Objectives :

1. To understand the role of Nutrition in the maintenance of good health.
2. To study nutritional deficiencies and their prevention.

Unit No.	Topic and Content	Practical / Related Experience	Teaching Methods
I.	Basic concepts of Nutrition Relation of good nutrition to normal physical development and sound health	---	Group Discussion, Demonstration
II.	Carbohydrates - Classification, digestion, absorption, metabolism, functions, sources and requirements	Formation of spot test	Lecture using OHP, Group discussion, assignment, seminar
III.	Protein : Classification, digestion, absorption, EAA, metabolism, functions, sources, requirements, and deficiency - Kwashiorkor, Marasmas		
IV.	Fats : (Lipids) Classification, digestion, absorption, metabolism, functions, PUFA, sources and effects of deficiency		
V	Energy : Definition, energy needs of the body, BMR, factors affecting BMR, determination of energy value - Bomb calorimetric method, determination of energy requirements - Direct calorimetry method.	--	Lecture

References:

1. Dr. M. Swaminathan, Advanced Text - Book on Food and Nutrition, Bappco, 1985.
2. N. Shakuntala Manay, M. Shadaksharaswamy, Foods Facts and Principles, Newage International (P) Ltd. Publishers, Second Edition, 2001.
3. Seema Yadav, Basic Principles of Nutrition, Anmol Publication Pvt. Ltd., First Edition, 1997.
4. Robinson, C.H. and Lawler, R.M., Normal and Therapeutic Nutrition, Maxmillan Publication & Co., New York, 1994, 17th edition.
5. Sri Lakshmi, B., Dietetics, New Age International Private Ltd., New Delhi, 1995.
6. Mahtab, S. Bamji, Pralhab Rao, R and Vinodhini, Text Book of Human Nutrition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, 1996.

ALLIED PAPER II

FAMILY RESOURCE MANAGEMENT – I

Objectives:

- To attain a thorough knowledge of understanding values and goals in house keeping
- To gain a basic knowledge of planning and constructing a house
- To understand a basic designs and art

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	<p>Housing Functions of the house and its environment House planning – site selection, factors to be considered, features of a house contributing to livability, orientation, grouping, roominess, lighting and ventilation, storage facility, privacy, flexibility, sanitation and economy Kitchen planning – different types – work triangle House plans – low, middle and high income groups</p>	<p>Draw the house plan and kitchen plan</p>	<p>Using OHP, lecture, group discussion</p>
II	<p>Care and maintenance of house a. Care and maintenance of house and its surroundings. b. Daily, weekly and periodical cleaning to keep the house in good condition. c. Insect and pest control – preventive and remedial measures to be adopted.</p>	<p>Visit to hotels to obtain knowledge on interior decoration and housing keeping</p>	<p>Group discussion, assignment</p>
III	<p>Design a. Elements of design, types of design, characteristics of a good design, principles of design b. Harmony – meaning, types – repetition, contrast, transition</p>	<p>Demonstration of different designs</p>	<p>Guest lecture, assignment, group discussion</p>
III	<p>c. Proportion – meaning – means of obtaining good proportion d. Balance – meaning – types and means of obtaining balance e. Emphasis – meaning – means of creating emphasis f. Rhythm – meaning – means of getting rhythm</p>		<p>Assignment</p>

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
IV	<p>Colour</p> <p>a. Qualities of colour – hue, value, intensity of colours and emotions, advancing and receding colours.</p> <p>b. How to use colours – proportion, balance, harmony, and rhythm in colour.</p> <p>c. Use of colour in interior decoration</p>	Demonstration on mixing colour	Group discussion
V	<p>Accessories, furniture, flower arrangement</p> <p>a. Selection, use and care of accessories, Picture and wall hangings, basic knowledge of flower arrangements – principles, types of flower arrangement.</p> <p>b) Selection and use of furniture – living room, bedroom and dining room – table setting.</p>	Visit to flower show, demonstration on different types of flower arrangement, wall hangings, picture	Lecture, group discussion

References:

1. Desh Pande, R.S., Modern Ideal Homes for India – United Book Corporations, Poone – 1971.
2. Stella Soundararaj. A Textbook of House hold Arts, Orient Longmans, Bombay – 1968.
3. Margaret Kaye. A. A Students hand book of House wifery, J.M. Dent Sons Ltd., London.
4. Paulena Nickell, Jean Muir Dorsey – Management in Family Living, Wiley Eastern Private Ltd.,

**SKILL BASED PAPER
FOOD PROCESSING AND PRESERVATION**

Objectives :

1. To understand the principles of food preservation
2. To develop skills for setting up production units

Unit – I

Objectives and principles of food preservation

Unit – II

- a) Low temperature - refrigeration, freezing
- b) High temperature – canning, dehydration, drying

Unit –III

Preservation by use of chemicals – preparation of crush, squashes, synthetic syrup

Unit –IV

Preservation by use of sugar – Jam, Jelly, Marmalade, Tuity-fruity

Unit – V

Pickling – Principles and methods

NON MAJOR ELECTIVE

HOME SCIENCE

1. Food Processing & Preservation
2. Dietetics - I

FOOD PROCESSING AND PRESERVATION

OBJECTIVES

3. To understand the principles of food preservation
4. To develop skills for setting up production units

Unit – I

Objectives and principles of food preservation

Unit – II

- c) Low temperature - refrigeration, freezing
- d) High temperature – canning, dehydration, drying

Unit –III

Preservation by use of chemicals – preparation of crush, squashes, synthetic syrup

Unit –IV

Preservation by use of sugar – Jam, Jelly, Marmalade, Tuty-fruity

Unit – V

Pickling – Principles and methods

DIETETICS - I

Objectives :

1. To gain insight into the national nutritional problems and their implications
2. To obtain knowledge about the methods of assessment of nutritional status
3. Develop skills in organizing and evaluating nutrition projects in the community

Unit : I

Nutrition throughout life cycle - I

- a) Basic principles of menu planning.
- b) Nutrition during pregnancy
- c) Nutrition during lactation

Unit : II

Nutrition throughout life cycle - II

- a) Nutrition during infancy
- b) Nutrition during preschoolers
- c) Nutrition during school going children

Unit : III

Concept of diet therapy

- a) Nutrition during adolescents
- b) Nutrition during adulthood
- c) Nutrition during old age

Unit : IV**Concept of diet therapy**

- a) Principles of therapeutic diet
- b) Modification of normal diets

Unit : V**Concept of diet therapy**

Nutrition for deficiency disorders - PEM Anemia and Vitamin A deficiency

SEMESTER IV

CORE PAPER - VI
ESSENTIALS OF MICRO NUTRIENTS

Objectives :

1. To understand the role of Nutrition in the maintenance of good health.
2. To study nutritional deficiencies and their prevention.

Unit No.	Topic and Content	Practical / Related Experience	Teaching Methods
I.	Micronutrients : Vitamins : History, Chemistry, absorption, functions, requirements, effects of deficiency, Fat soluble Vitamins - A, D, E and K, water soluble Vitamins - C and B complex Vitamins	Formation of spot test	Lecture assignment, group discussion
II.	Major Minerals : Functions, sources, requirements and effects of deficiency of minerals	---	Guest lecture Group discussion
III.	Trace Elements : Functions, sources, requirements and effects of deficiency of trace elements	--	Lecture
IV.	a. Inter relationship between carbohydrates, proteins, fat, vitamins and minerals	--	Lecture assignment, group discussion
	b. Water balance	--	Lecture assignment, group discussion
V	Enzymes - Classification, factors affecting enzyme action	--	Lecture assignment, group discussion

References:

1. Dr. M. Swaminathan, Advanced Text - Book on Food and Nutrition, Bappco, 1985.
2. N. Shakuntala Manay, M. Shadaksharaswamy, Foods Facts and Principles, Newage International (P) Ltd. Publishers, Second Edition, 2001.

3. Seema Yadav, Basic Principles of Nutrition, Anmol Publication Pvt. Ltd., First Edition, 1997.
4. Robinson, C.H. and Lawler, R.M., Normal and Therapeutic Nutrition, Maxmillan Publication & Co., New York, 1994, 17th edition.
5. Sri Lakshmi, B., Dietetics, New Age International Private Ltd., New Delhi, 1995.
6. Mahtab, S. Bamji, Pralhab Rao, R and Vinodhini, Text Book of Human Nutrition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, 1996.

PRACTICAL

ESSENTIALS OF MACRO AND MICRO NUTRIENTS

- a) Qualitative test for Sugar
- b) Qualitative test for proteins
- c) Qualitative test for minerals
- d) Quantitative estimation of Vitamin C in Greens
- e) Quantitative estimation of Vitamin C in Lime Juice
- f) Quantitative estimation of Vitamin C in Curds
- g) Quantitative estimation of reducing sugar in Fruit Juices
- h) Quantitative estimation of reducing sugar in honey
- i) Quantitative estimation of Calcium
- j) Quantitative estimation of Phosphorus 1

ALLIED PAPER II

FAMILY RESOURCE MANAGEMENT – II

Objectives:

1. To enable the students to understand the importance of home management in family and personal living
2. To improve their ability in family resource management
3. To understand and apply basic principles of art in interior designing

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	Management: a. Definition and meaning of management – characteristics of a good home maker - management process – planning, organizing, controlling and evaluating b. Motivating factors in management – values, goals and standards. Decision making – steps in decision making	--	Lecture, using OHP, assignment, seminar
II	Resources a. Resources – classification and characteristics b. Time and Energy Management –		

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
	Importance of time management, guidelines in planning time schedule, fatigue - types and overcoming fatigue – work simplification – Mundel's Law	Work simplification techniques, time management	Group discussion, lecture
III	Standard of living – constituents – factors affecting, causes for low living standards in India.		Group discussion, lecture
IV	<p>Money Management</p> <p>Family Income – types, sources methods of augmenting family income.</p> <p>Family expenditure – budget – meaning – types of budget-planning a family budget – steps in planning, advantages of budgeting – Engel's law of consumption</p> <p>Savings – meaning – need, saving institutions – Bank – Post office – Insurance – Chit fund – Unit trust of India</p>	<p>Steps in making the budget for a family various ways of improving the income of 10 family</p> <p>Visit to Banks and post offices</p>	<p>Seminar, group discussion, lecture, using OHP</p> <p>Guest lecture</p>
V	<p>Purchase pattern and consumer protection:</p> <p>a. The home maker as a wise consumer – rights of a consumer – consumer education – consumer aids – advertisement – standards-labels – price tag</p>	Cottage stay	Lecture, assignment, seminar
V	<p>b. Consumer protection – need – measures adopted to provide consumer protection – consumer laws – consumer courts – consumer movement</p> <p>c. Residence course – need, objectives planning, organisation and evaluation of the course – role of supervisor and staff adviser</p>		

References:

1. Deshpande, R.S. Modern Ideal Homes for India – United Book corporations, Pune – 1971.
2. Paulena Nickell, Jean Muir Dorsey – Management in Family Living, Wiley Eastern Private Ltd.,
3. McCall's Editors – McCall's Decorating book – Random House, McCall's.
4. Van Dommolen, D.B. Designing and Decorating Book – John Wiley & Son.
5. Mann, M (1980) home Management for Indian families, New Delhi Kalyan Publishers.

**SKILLED PAPER
FUNDAMENTALS OF BAKING**

Objectives:

This course will enable the students to

1. understand basic concepts of baking
2. Acquaint with the role of various major and minor ingredients in bakery products
3. Familiarize with baking process and operations.
4. Learn the quality parameters of bakery products

Unit – I:**Introduction**

- a) Introduction of baking
- b) Principles of baking
- c) Equipments needed – ovens, dough mixer, egg beater.

Unit -II**Role of ingredients in baking – I**

- a) Wheat
- b) Fats and oils
- c) Egg

Unit -III**Role of ingredients in baking-II**

- a) Milk, Sugar, Salt and Water
- b) Flavor agents
- c) Leavening agents – physical, biological

Unit – IV

Preparation of cakes – rich cakes, plum cakes, pineapple upside cake.

Unit – V

Preparation of cookies, bread rolls.

NON-MAJOR
1. FUNDAMENTALS OF BAKING
2. DIETETICS -II

FUNDAMENTALS OF BAKING

Objectives:

This course will enable the students to

5. understand basic concepts of baking
6. Acquaint with the role of various major and minor ingredients in bakery products
7. Familiarize with baking process and operations.
8. Learn the quality parameters of bakery products

Unit – I:

Introduction

- d) Introduction of baking
- e) Principles of baking
- f) Equipments needed – ovens, dough mixer, egg beater.

Unit -II

Role of ingredients in baking – I

- d) Wheat
- e) Fats and oils
- f) Egg

Unit -III

Role of ingredients in baking-II

- d) Milk, Sugar, Salt and Water
- e) Flavor agents
- f) Leavening agents – physical, biological

Unit – IV

Preparation of cakes – rich cakes, plum cakes, pineapple upside cake.

Unit – V

Preparation of cookies, bread rolls.

DIETETICS - II

Objectives :

1. To gain insight into the national nutritional problems and their implications
2. To obtain knowledge about the methods of assessment of nutritional status
3. Develop skills in organizing and evaluating nutrition projects in the community

Unit : I

Therapeutic diets for

- a) Obesity and underweight
- b) Diabetes Mellitus

Unit : II

Therapeutic diets for

- a) Peptic ulcer
- b) Cirrhosis and Hepatitis

Unit : III

Therapeutic diets for

- a) Atherosclerosis
- b) Hypertension

Unit : IV

Therapeutic diets for

Febrile condition - Typhoid, TB and Malaria

Unit : V

Therapeutic diets for

Cancer, burns and allergy

**SEMESTER V
CORE PAPER - VII
CLINICAL BIOCHEMISTRY**

Objectives:

1. To study different tests for diseases
2. To know the biochemical composition of bloods and different parts of the body

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	Blood Sugar Level of blood glucose in normal and abnormal conditions- Ketosis – Diabetic coma –	Visit to lab to observe the lists used for abnormal glucose level in blood	Lecture, Use of OHP
II	Inborn Errors of carbohydrate metabolism Pentosuria, Galactosemia Glucose Urea, Glycogen storage disease – Glucose tolerance test	Visit to lab to observe the lists used for abnormal glucose level in blood	Lecture, Use of OHP
III	Blood Lipids Types and level of lipids in blood disorder of lipoproteins – Hyper and Hypo Cholesterol, Atherosclerosis Inborn errors of fat metabolism.	A mini project related to heart diseases	Lecture, group discussion
IV	Plasma Protein: Plasma – Types – Functions – inborn errors of amino acid metabolism – phenylketonuria Albinism – Alkaptonuria and maple syrup disease	Conduct a survey to find out the prevalence of Inborn errors of metabolism	Lecture, Quiz programme

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
V	Gastric disorders Bile Salt – Functions, formation of bile acids and bile salts-bile pigments from haemoglobin. Test for kidney function-clearance test.	Visit to labs to observe liver and gastric test	Lecture, Use OHP, Use of other audio visuals

References :

1. Cantrow A and Trumper, Clinical Bio-Chemistry, M.W.B. Saunders co-1975.
2. Swaminathan, m. Bio-Chemistry for medical teachers.
3. Harold valley, Clinical, Bio-Chemistry (1986).
4. Saunder's C Clinical Bio-Chemistry.

CORE PAPER X

FOOD CHEMISTRY

Objectives :

1. Understand the meaning and chemical preparation of carbohydrates in foods
2. Explain the role of lipids and protein in foods
3. Acquire knowledge on the chemical changes occurring in foods

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	Carbohydrates in food: a) Introduction to food chemistry, b) Monosaccharides- structure, properties & derivatives c) Oligosaccharides- structure, properties & derivatives	Evaluation of food grains for their character	Lecture, group discussion, use of charts in classification
II	Carbohydrates in food: a) Functions of sugars in foods b) Polysaccharides and their role in foods	Qualitative test for carbohydrate Estimation of reducing sugar	Lecture, assignment presentation, guest lecture
III	Lipids in food a) classification and composition b) characteristics of fat c) functional properties		Lecture, assignment presentation, guest lecture
IV	Functional role of proteins a) Denaturation of proteins, b) foam formation of proteins, c) functional role in foods		Lecture, assignment presentation, guest lecture

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
V	<u>Functional role of vitamins and minerals</u> Vitamins and minerals – Functional role in foods and its bioavailability		Lecture, assignment, presentation, quiz competition

References:

1. Seema Yadav, 1997, Food Chemistry, Anmol Publications Pvt. Ltd, New Delhi
2. Meyer. L.H, Food Chemistry
3. Srilakshmi. B, 2002, Food Science, New Age International (P) Ltd, New Delhi
4. Shankuntala Manay, 2001, Food Principles, New Age International (P) Ltd, New Delhi

ELECTIVE PAPER (Any two)

**OPTIONAL-I
FOOD MICROBIOLOGY**

Objectives :

- To instruct students who are having their first experience with microbiology on the nature of micro organism
- To outline the source of contamination and their aspects of foods
- To understand the principles of food preservation
- To gain knowledge of the methods to prevent contamination

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	General characteristics: General characteristics of main group of microorganisms – Bacteria, fungi, yeast.	Identify some micro organisms	Lecture, Demonstration
II	Microorganisms of soil, water, sewage & atmosphere: Soil – Nitrogen cycle, carbon cycle, sulphur cycle & Phosphorus cycle Water – methods of water purification, types of microorganisms Sewage – Sewage treatment methods, types of microorganisms Air – microbial pollution Control measures	Visit to sewage treatment plant	Lecture use of OHP using charts

III	Contamination of Cereals and cereals products: Contamination and prevention of spoilage of cereals and cereals products Contamination and prevention of spoilage of vegetables and fruits	Observe & note the spoilage in fruits and vegetable	Lecture, group discussion
IV	Contamination of milk, fish, meats : a. Contamination and prevention of spoilage of milk and milk product b. Contamination and prevention of spoilage of meats, fish and other sea foods	Observe and note the spoilage in milk and fish	Lecture, assignment presentation
V	Contamination of eggs and poultry: Contamination and prevention of spoilage of eggs Contamination and prevention of spoilage of poultry	Observe and note the spoilage in egg and poultry	Lecture, conducting quiz, group discussion

Selected References:

- Joshua. A.K. Microbiology, India printing works
- Martein Probisher, Fundamentals of micro-biology
- Goss, R.C., Experimental Microbiology. Guide laboratory, Kalyani publishers
- Frazier, W.C. Food Microbiology, Tata Mc. Graw Hill Book Company, Bombay, 1988
- Adams, M.R and Moss M.O. Food Microbiology Royal Society of Chemistry, Cambridge, 1995
- Banwart, G.T, Baric Food Microbiology CSS Publishers, New Delhi. 1987

ELECTIVE PAPER OPTIONAL II FOOD SERVICE MANAGEMENT

Objectives :

To enable students to

- Gain knowledge about various types of food service
- Understand the principles and functions of management
- Understand personnel management, financial management and legal aspects of catering
- Realise the importance of sanitation and hygiene in food service institution

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	Management and Organisation: a. Lay out for kitchen – location – layout – work centres – lighting – ventilation – storage areas b. Storage spaces – location, types of	Visit to hotel to see the kitchen service and storage space	Lecture on group discussion

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
	storage – layout c. Service areas – location – planning service areas, layout		
II	Management and equipment: a. Tools of management – organizational chart – Job description – Job specification – job analysis work and time schedule – production and service analysis – budget. b. Equipments – classification – selection, care, maintenance.	Visit to equipment shops to study the new model of kitchen equipment	Lecture Training on preparation of organizational chart and budget Demonstration on equipment
III	Personnel Management Recruitment – sources – selection – steps in selection – methods of induction – formal, informal training – supervision.	Practical experience on preparation of recruitment	Lecture, group discussion, paper presentation
IV	Food Service Management: Procedure for purchasing and receiving and storage Types of menu-principles involved in menu planning – techniques in writing menu card Standardisation of recipes Portion control and utilization of left over Styles of service – waiter service, self service, vending, mobile catering	Training in purchase of materials in hotel, menu planning technique, standardization of recipe	Lecture, demonstration on styles of service
V	Financial Management : Food cost control – factors responsible for losses – methods of controlling food cost Book keeping – advantages of double entry system, book of accounts, purchase book, sales book, purchase return book, sales return book, journal and balance sheet	Cost analysis	Lecture, quiz competition, preparation of balance sheet

References:

1. Mohini sethi and Surjeet malhan, 1993, catering management and Integrated Approach wiley Eastern Ltd., New Delhi.
2. West, B.B Wood, L. Harger, V.F and Shugart G. (1993) Food science in institutions, John Wiley and sons, New York.

3. The theory of catering, Kinton and Ceasarani 91996) ELBS.
4. Malhotra – Food Service Management – Anmol publishers, New Delhi.
5. Vera clausen Crusius (1984), Quantity Food Management – Principles and Applications, surjeet publications.

**ELECTIVE PAPER
OPTIONAL III
HYGIENE AND SANITATION**

Focus:

Understand the principles and application of hygiene and sanitation in Food Processing.

Objectives :

This course will enable the students to –

1. Develop good habits of personal and environmental hygiene.
2. Learn safe handling of food and ensure complete safety of raw and processed foods.

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	<u>Hygiene</u> a. Definition of hygiene – its application to everyday life. b. Personal hygiene.	--	Group discussion
II	Safe handling of food : Personal hygiene including uniform, medical check-up, good food handling habits and training. Control and eradication of flies, cockroaches, rodents and other pests.	Spot test	Lecture Assignment
III	Disinfections : Definition of disinfectant, sanitizer, antiseptic and germicide. Common disinfectants. Use in ease of working surfaces, kitchen equipment, dish washing, hand washing etc. Sterilization of kitchen and service equipment. Sanitizing of watering equipment	Survey on equipment	Demonstration Lecture Seminar
IV	Care of premises and equipment Impervious washable floors and walls. Table tops, floor etc. Good ventilation and lighting. Care of dark corner, crevices and cracks. Garbage disposal – collection, storage and proper disposal from the premises.	Visit Food Corporation India	Lecture
V	Food Adulteration and laws a. Food adulteration and public health	Test the adulterants	Guest lecture

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
	<p>hazards. Prevailing food standards in India – P.F.A., F.P.O., Agmark and B.I.S.</p> <p>b. Legal administration and quality control – laws relating to food hygiene</p>	present in the sample	<p>Lecture</p> <p>Observation method</p>

References :

1. Hobbs, B.C. and Gilbert, R.J. (1970): Food Poisoning and Food Hygiene, Edward Arnold, London.
2. Rack, B.G: Hygiene in food manufacturing and Handling, Food trade press, London.
3. Longree, K. Blaker, G.G. (1971): Sanitary techniques in food service, John Wiley, New York.
4. Longree. K. (1967): Quantity food sanitation, 2nd Ed. Inter Science Publishers.
5. John Wiley & Sons, New York.

SEMESTER VI

CORE PAPER VIII **FOOD PACKAGING**

Objectives :

This Course is designed to enable students to:

- Gain knowledge about various packaging materials and importance of packaging.
- Be familiar with testing and evaluation of packing media.
- Be familiar with packaging laws and regulations.
- Be able to select appropriate packaging material for a variety of foodstuffs vis-à-vis the need for preventing environment degradation.

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	<p>a) Packaging – Concepts, Definition, Significance, Classification.</p> <p>b) Application in packaging</p>	--	<p>Lecture</p> <p>Group discussion</p>
II	<p>Primary Packaging Media – Properties and applications.</p> <p>Paper boards, metals, plastics, wood & plywood, glass, flexible, tin, aluminum can, foil.</p> <p>Labels, caps & closures & wads, adhesives, inks & lacquers, cushioning materials,</p>	Identify different packaging material	<p>Guest lecture</p> <p>Lecture</p> <p>Seminar</p>

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
	reinforcements		
III	Testing & evaluation of packing media – retail packs (including shelf life evaluation) and transport packages	Demonstration on evaluation of packing	Lecture Assignment presentation
IV	Packaging systems and methods for food products – vacuum packaging, gas packaging, Aerosol packaging, Shrink packaging, Aseptic & retort packing, Bag-in Box, MAP, BOPP	Visit to packaging centers	Lecture Assignment presentation Use of OHP
V	a) Storage, handling and distribution of packages (foods) – Effect of improper packaging – Preventive techniques. b) Branding and labeling. c) Packaging laws and regulations	Prepare labels and different packaging	Guest lecture Group discussion Seminar

References :

1. Sachrow & Griffin, Food Packing – AVI Publications.
2. Hotchikess Food & Packaging Interaction – American Chemical Society.
3. Darry, R. & T, Blackie: Principles & Applications of MAP – Academic & Professions.
4. Bhatia S.C. Canning & Preservations of Fruits & Vegetables – New Delhi, India.
5. Robertson G.L. Food Packaging – New York, Marcell Dekker, INC.
6. Bureau of G & Multon J.K. Food Packaging Technology (Vol.1 & 2) – VCH, Publishers, INC, New York.

CORE PAPER - IX NUTRITION THROUGHOUT LIFE CYCLE

Objectives:

- a. To help students to understand the basis of meal planning.
- b. To obtain knowledge on various nutritional deficiency disorders.
- c. To understand the nutritional needs of members at different age levels.

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	Requirements for infancy and preschool age: a) Infancy – Growth and development, nutritional requirements, breast feeding, weaning practices, diet supplements b) Pre school age – nutritional requirements, factors affecting	Menu planning, preparation and evaluation for preschool child.	Lecture, preparation of chart for supplementary foods

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
	nutritional status, problem related to nutrition	Visit to balwadi	
II	<p>Balanced diets for school going children and adolescence:</p> <p>a) Balanced diet – meaning, basic principles meal planning</p> <p>b) Planning meals for different socio economic conditions – low income, middle income & high income groups</p> <p>c) School age – nutritional requirements, food requirements, packed lunches, school lunch programmes</p> <p>d) Adolescence – Nutritional requirements, food habits, fast food, nutritional problems</p>	<p>Menu planning, preparation and evaluation for school age adolescence period</p> <p>Visit to ICDS</p>	Lecture, group discussion, assignment preparation
III	<p>Balanced diets for adults, pregnant, lactating mother</p> <p>Adult – nutritional requirements, food requirements, principles involved in planning of meals.</p> <p>Pregnant woman – Physical changes, nutritional requirements, food requirements, problems related to nutrition, during pregnancy complications & dietary problems</p> <p>Lactating mothers – nutritional requirements, food management</p> <p>Geriatric Nutrition – Process of aging, physiological and biochemical changes, considerations in feeding elderly</p>	<p>Menu planning, preparation and evaluation for pregnant women, lactating mother and old age</p>	Lecture, demonstration on low cost nutritious food, quiz programme
IV	<p>Diet Modification:</p> <p>Definition – importance – modification of normal diet – clear fluid – full fluid & soft diet.</p> <p>Tube feeding, parenteral feeding.</p> <p>Pre and post operative diets</p>	<p>Visit to hospital to see tube feeding and parenteral feeding</p>	Lecture, Use of OHP

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
V	<p><u>Diet for Deficiency conditions:</u></p> <p>a. Nutritional deficiency diseases – PEM, Vitamin A and Anaemia</p> <p>b. Lactose intolerance, phenyl ketonuria, alkaptonuria, galactossemia and sickle cell anaemia</p>	Visit to school to observe deficiency diseases, menu planning for PEM, Vitamin A deficiency and Anaemic person	Lecture, assignment presentation, preparing spotters for deficiency diseases

References:

1. Sri Lakshmi (2004) Dietetics, Wiley Eastern publishers.
2. Corrine Robinson (1990) Normal and Therapeutic Nutrition, Oxford and IBH publishers.
3. Swaminathan. M. (2003) Principles of Nutrition and Dietetics, Bappco publishers, Bangalore.
4. Gopalan Etal., (1996) Nutritive value of Indian food, NIN publication, Hyderabad.
5. Bhavana sabarwal (1999) principles and practices of Dietetics, Ajay verma common wealth publishers, New Delhi.
6. Davidson Passmore (1989) Human Nutrition and Dietetics, London Churchill and Livingston publishers.

**CORE PAPER XI
DIETETICS**

Objectives :

1. To gain insight into the national nutritional problems and their implications
2. To obtain knowledge about the methods of assessment of nutritional status
3. Develop skills in organizing and evaluating nutrition projects in the community

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	<p>Diseases of GIT</p> <p>a. Diet in diseases of the digestive tract – peptic ulcer, diarrhea and constipation.</p> <p>b. Diet in diseases of the liver and biliary tract – hepatitis, cirrhosis, gall bladder diseases.</p>	Menu planning, Preparation and evaluation of peptic ulcer, hepatitis and Cirrhosis	Lecture Group discussion
II	<p>Febrile and Diabetes Mellitus</p> <p>a. Diet in Febrile conditions, causes, types, metabolic changes, diet modification in Influenza, Malaria, typhoid, tuberculosis</p>	Menu planning, Preparation and evaluation of typhoid, tuberculosis, Diabetes	1. Lecture 2. Preparation of food exchange list for diabetes

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
	b. Diet in Diabetes Mellitus – etiology, changes in metabolism, clinical symptoms, methods of treatment- diet, drug, complications and Food Exchange list	Mellitus	
III	Cardiac disorders and allergy a. Diet in Cardiac disorders: Atherosclerosis and hypertension, signs and symptoms, complications, diet modification b. Diet in food allergy- definition, classification, tests for allergy, diet modification	Menu planning, Preparation and evaluation of Atherosclerosis and hypertension	Lecture, guest lecture, seminar
IV	Kidney diseases and burns Diet in Kidney disease: acute, chronic – glomerulonephritis, nephrosis, renal failure, anemia, urinary calculi, etiology, symptoms, diet modification. Diet in burns degrees of burns and diet management	Menu planning, Preparation and evaluation of glomerular nephritis, renal failure, urinary calculi	Lecture, quiz competitions assignment presentation
V	Obesity, Underweight and Cancer a. Diet in obesity & underweight – causes, methods of diagnosis, diet modifications b. Diet in Cancer – types, clinical symptoms, and dietary management.	Menu planning, Preparation and evaluation of obesity & underweight Visit to hospitals for diet counseling	1. Lecture 2. Assignment presentation 3. Group discussion

References:

1. Sri Lakshmi (2004) Dietetics, Wiley Eastern publishers.
2. Corrine Robinson (1990) Normal and Therapeutic Nutrition, Oxford and IBH publishers.
3. Swaminathan. M. (2003) Principles of Nutrition and Dietetics, Bappco publishers, Bangalore.
4. Gopalan Etal., (1996) Nutritive value of Indian food, NIN publication, Hyderabad.
5. Bhavana sabarwal (1999) principles and practices of Dietetics, Ajay verma common wealth publishers, New Delhi.
6. Davidson Passmore (1989) Human Nutrition and Dietetics, London Churchill and Livingston publishers.

ELECTIVE
FUNDAMENTAL OF TEXTILES AND CLOTHING.

OBJECTIVES:

1. To understand the characteristics & properties of textile fibers
2. To acquire thorough knowledge on fabric & yarn
3. To understand the construction of yarn and fabric.

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
I	<p>b. <u>Fibres:</u> Definition, classification, general characteristics of cellulose, protein, thermoplastic and mineral fibres.</p> <p>c. <u>Major and minor textile fibres:</u> Manufacturing process, properties, use and care of textile fibres (eg) cotton, silk, rayon.</p> <p>c. Study of minor fibres jute, hemp, Coir.</p>		
II	<p>a. <u>Yarn construction:</u> Definition, twist, types and counts.</p> <p>b. <u>Fabric construction</u> Weaving-definition, Types of weave-basic Weaves – plain, twill, satin and decorative Weaves (Jacquard weave).</p>		
III	<p>Fabric finishes – definition:</p> <p>a. Boiling, scouring, sizing, carbonizing, bleaching, shearing, singeing, calendaring, tendering, weighting, mercerizing.</p>		

Unit. No	Topic and content	Practical/ Related experience	Teaching methods
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- III
- b. Dyeing – initial dyeing – stock, yarn, piece, cross dyeing tie and dye, batik methods.
 - c. Printing – types block, stencil, screen.
 - d. Parts and function of sewing machines, use and care.
 - Tools for clothing construction.
 - Basic hand stitches.
 Temporary – basting-even, uneven, diagonal.
 Permanent – hemming, back stitch, whipping, overcasting, run stitch.
 - e. Embroidery – stem, chain, cross, bullion, lazy – Daisy, fly, wheel, couching, blanket.

V SEAMS, NECK LINE, PLACKETS, GATHERS, FASTENERS, BIAS.

- a. Seams – definition, types.
- b. Bias – uses, types.
- c. Neck line – facing, binding, collar, peter pan collar.
- d. Fasteners – Types, uses & disadvantages.
- e. Plackets – uses, types.
- f. Garment Constructions
 Drafting – panty, A – line frock, six gore skirt, blouse

REFERENCES:

1. Fundamentals of textiles and their use. (Orient Longman Ltd.,)
2. Textiles fibres and their use – X.P. Hoss.
3. Household Textiles and laundry work Danlkar.
4. Mary Mathew.
5. Clothing for modern – Macmillan & co.
6. Pattern drafting and making up – Bela Kapoor.

**PRACTICAL I
 NUTRITION THROUGHOUT LIFE CYCLE - I**

- a) Basic principles of menu planning
- b) Nutrition during pregnancy and lactation

- c) Nutrition during infancy and lactation
- d) Nutrition during preschoolers
- e) Nutrition during school children & adolescence
- f) Nutrition during oldage

**PRACTICAL II
FOOD CHEMISTRY**

- Determination of gluten content
- Preparation of colloid, gel, foam, emulsion
- Determination of acidity in flour
- Determination of acid value and free fatty acids
- Determination of peroxide value in fat and oil
- Purity in fat and oil
- Evaluation of milk samples

**PRACTICAL III
Dietetics**

Menu Planning for

- a) Underweight and Obesity
- b) Diabetics
- c) Peptic Ulcer
- d) Cardiovascular disease
- e) Renal Disorders
- f) Fever

APPENDIX - AZ58

**MANONMANIAM SUNDARANAR UNIVERSITY, THIRUNELVELI,
B.SC HOTEL MANAGEMENT AND CATERING SCIENCE
(For those who joint the course from the academic year 2012- 2013 onwards)
Semester – I**

	components	hours	Credits
Part-I	Tamil / other language(1 course)	6	3
Part-II	English (1 course)	6	3
Part-III	Core subjects (2courses 1T/1P) Food production and patisserie – I Food production and patisserie	6 4	8
	Allied subject (1 course) Housekeeping management – I Housekeeping management	4 2	4
Part-IV	Environmental studies (1 course)	2	5
total	(5T/2P courses)	30	20

Semester - II

	components	Hours	Credits
Part -I	Tamil/ other languages (1 course)	6	6
Part - II	English (1 course)	6	6
Part-III	Core subject (2 course 1T + 1P) Food production and patisserie – II Food production and patisserie – I	6 4	6
	Allied subject (2 course) House keeping management - II House keeping management - I	4 2	4
Part-IV	Value based education (1 course)	2	2
total	(5T + 1P)courses	30	20

Semester – III

	components	Hours	Credits
Part III	Core subjects (2T + 1P) 3courses Food production and patisserie – III Food production and patisserie – II Front office management - I	6 6 6	12
	Allied subject (1 courses) Food and beverage service – I Food and beverage service – I	4 2	2
Part IV	Skilled based subject (1 courses) – allied Principles of tourism management	4	4
	Non major elective (1 courses II) 1. Hospitality management – I or 2. Bakery and confectionery - I	2	2
total	(5T + 2P)courses	30	20

Semester – IV

	components	Hours	Credits
Part III	Core subjects (2 courses) (1t + 1p) Food production and patisserie – IV Food production and patisserie – II	6 6	8
	Major elective (1course) Front office management - II	6	6
	Allied subject (1 courses) Food and beverage service – II Food and beverage service – I	4 2	4 2
Part IV	Skilled based subject (1 course) Computer application in hotel industry	4	4
	Non major elective II (1 courses) Hospitality management –II Or Bakery and confectionery -II	2	2
Part V	Extension activity		1
total	(5T + 2P)courses	30	26

Semester – V

	components	Hours	Credits
Part III	Core subjects (2 courses) (3t + 1p)		
	Food production and patisserie – V	4	16
	Food production and patisserie – III	8	
	Food and beverage service – III	4	
	Hotel accounting	4	
Major elective (1course)	6	5	
	Food and beverage management		
Part IV	Skilled based subject (1 course)common	4	4
Total	(5T + 1P)courses	30	25

VI Semester

	Components	Hours	Credits
Part-III	Core subjects (1T + 4P)	4	5
	Human recourse management	8	4
	Food and beverage service – II	8	10
	Internship training report and viva voice	8	4
	Food production and patisserie –III	2	2
	Front office management.		
Total		30	25

Semester – III

Core subject

Food production and patisserie – III :

Unit – I

Quantity food production

Equipment: quality of equipment used, specification of equipment, list of manufacturers, care and maintenance of equipment, heat and cold generating equipment, modern developments in equipment manufacturing.

Menu planning: basic menu planning, special emphasis on quantity food production, planning for various categories, such as school/ college students, industrial workers, hospital, canteens, outdoor parties, theme dinners, transport/mobile caterings, parameters for quantity food menu planning.

Unit – II

Indian cookery (regional cooking styles)

Introduction to regional cooking, factors affecting eating habits, heritage of Indian cuisine, differentiation of regional cuisine

Cooking from different states under geographical location, historical background, availability of raw materials (seasonal), equipment and fuel (special), staple diet, specialty cuisine, food prepared for festival and occasion. States to be covered Andhra Pradesh, Bengal, Bihar, Goa, Gujarat, Karnataka, Kashmir, Kerala, Maharashtra, North eastern states, Punjab, Rajasthan, and Tamil Nadu & Uttar Pradesh. Cooking from different communities / styles such as Parsee, Chettinad, Bohra, Avadh, Malabari, Lukhnawi, Indian breads, Indian sweets.

Unit – III

International cuisine

Chinese cuisine: characteristics, preparations & cooking techniques, utensils and ingredients used – regional styles of Chinese cooking – examples of Chinese dishes.

Unit – IV

International cuisine

Italian cuisine: characteristics, main ingredients, pasta – types of pasta, preparation of pasta. Noodles – types, polenta, gnocchi – variations, spaetzle – presentation style. Examples of Italian dishes.

Unit – V

International cuisine

Thai cuisine: Characteristics, comparison with Indian & Chinese cuisine. Ingredients used. Mexican cuisine – characteristics, ingredients used – examples of Mexican dishes.

Reference text:

1. The Indian menu planner (lustre) – welcome group chefs.
2. The professional chef (IV edition) – Le Roy A. Polson.
3. The book of ingredients – Jain Grigson.
4. Professional cooking - Wayne Gisslen
5. Italian cooking for pleasure – Mary Roynolds

Semester – III

Core subject

FRONT OFFICE MANAGEMENT – I

UNIT – I

Introduction to the hotel industry.

Classification of hotels as per location, size, clientele, length of stay, heritage hotels, all-suite hotels, time share, condominiums, casino hotels, convention hotels, conference hotels, star hotels.

The accommodation product – Type of guest room – as per number and size of beds, décor, room size and view, executive floor, presidential suites.

Rates – Room rate, rack rate, corporate rate, commercial rate, airline rate, group rate, children rate, package plan rate, government rate, weekend rate, half-day charges.

Meal plans – EP, CP, AP, MAP.

Types of hotel guests – Pleasure travellers, DFIT, FFIT, GIT, Special interest tours, incentive tours, business travellers, convention and conference guests.

The Front Office Department – Functions and components of front office department. Organizational chart of a Front Office department (large, medium and small). Attributes of Front Office staff.

UNIT – II

Duties of Front Office personnel – Reservationist, Receptionist, Information Assistant, front Office Cashier, Bell Captain, Bell Boy, Concierge, Telephone Operator, Guest Relations Executive, Front Office Manager, Lobby Manager, Business center Co-coordinator, Night auditor.

Equipments used in Front Office – Information rack, alphabetical rack, mail and key rack, computers, billing machines, folio, PBX, PABX, EPABX, log book. Lay out of a Front Office counter – Manual, semi-automated and computerized Guest cycle.

UNIT – III

Reservation – Functions of reservation systems, types of reservation – Guaranteed, non-guaranteed, advanced and confirmed. Reservation enquiry, sources of reservation – group travellers, pleasure travellers, travel agents, airline, central reservation system, intersell agencies, group reservations.

The reservation process – The reservation request, accepting or denying a request. Accepting a reservation – the reservation from, importance of guest history, reservation confirmation, confirmation number. Charting the reservation data (reservation charts – density chart, Whitney reservation system). Modifying a reservation.

Reservation maintenance – Guaranteed reservation, non-guaranteed reservation, credit card guaranteed, advance deposit, other guaranteed reservations, over-bookings, group reservations – special details.

UNIT – IV

Registration/check-in procedure – Main duties of the reception department. Basic check-in activities:

- (a) Preparation of guest arrival (room status availability, arrival and departure list, special requests. VIP and frequent stay guests, guest history record).
- (b) Registration (registration from – its use, black list, pre-arrival registration).
- (c) Room assignment and room rate (special requests, early check-in, walk-in, scanty baggage).
- (d) Checking methods of payments (direct, bill to company, processing a credit card, travel agents vouchers, transfer credit/debit, advance deposits).
- (e) Issuing the key and escorting the guest (role of bell desk, bell boy arrival errand card, key card).
- (f) Completing the forms – Arrival and departure register, 'C' form alphabetical guest register, guest folio, arrival intimation notice.
- (g) Housekeeper's report – Housekeeping discrepancy report, various terms – SB, DND, DL, DC sleeper, SO, OOO, VR, CO.
- (h) Taking position formula plus and minus position.
- (i) Handling guest mail and messages.

UNIT – V

Types of folios (guest, master, non-guest), allowances, paid-outs.

Check-out procedures – Role of bell desk, cashier, late check-outs

Methods of account settlements and procedure for accepting such settlements.

Updating Front Office records (room status / room rack, arrival / departure register, guest history cards, departure intimation notice).

Calculation of house count, room count, percentage of single occupancy, percentage of double occupancy.

Front Office security functions – The role of Front Office in key control, electronic card key, handling the grand master key, lost keys, damaged keys, keys given against key cards.
Safe deposit locker (key and their control, safe deposit registration card)
How to deal with lost and found.
Emergency procedures – medical, robbery/theft, fire, death.

REFERENCE TEXT:

1. Basic Hotel Front Office Procedures – Peter Renner – Van Nostrand Reinhold.
2. Managing Front Office operations – Michael L. Kasavana – Education Institute AHMA.
3. Hotel & Motel Front Desk Personnel – Grace Paige and Jane Paige – Van Nostrand Reinhold.
4. Principles of Hotel Front Office Operations – Sue Baker, Pam Bradley & Jeremy Huyton – Cassell.
5. Front Office Procedures, Social skills and Management – Petrabbol & Sue Lowry – Butterworth Heinemann.

Semester – III
Allied paper
FOOD & BEVERAGE SERVICE – I

Unit – I

Introduction to catering – different types of catering establishments. Scope of caterers in the industry, relationship of catering industry with other industries. Status of the waiter /waitress in the catering industry.

Attribute of waiter: personal hygiene, punctuality, personality, and attitude towards guests, appearance, and salesmanship, sense of urgency and sense of urgency.

Unit – II

Staff organization- The principle staff of different types of restaurants. Duties and responsibilities of restaurant staff.

Types of restaurant: over view and key characteristics of coffee shop continental restaurants specialty restaurants, pubs, night clubs, discotheques, snake and milk bar.

Unit – III

Operating equipment's: classification of crockery, cutlery, glassware, hollowware, and flatware. Special equipment – upkeep and maintenance if equipment's.

Unit – IV

Ancillary department: pantry, stillroom, silver room, wash – up and hot – plat.

Restaurant service: Mise-n-place. Points to be remembered while laying table. Do's and don'ts in a restaurant. Dummy waiter and its uses during service.

Unit – V

Different types of menu: origin of menu, a la carte menu, French classical menu, planning of simple menu; food and their usual accompaniments.

Reference text:

1. The waiter – john fuller & A J Currie – Hutchinson
2. Modern restaurant service, a manual for student & practitioner – john fuller
- Hutchinson
3. Food and beverage service - Dennis R. lillicrap & john A. cousins – ELBS.

Semester – III
Skilled based subject – allied
PRINCIPLES OF TOURISM MANAGEMENT

Unit – I

Definition of tourism – origin and growth of tourism – types of tourism – forms of tourism – basic components of tourism.

Unit –II

Importance of tourism in modern times – causes for the rapid growth – concepts of domestic and international tourism.

Unit – III

Travel agency and its functions – travel agent in India – role of Tamil Nadu tourism Development Corporation.

Unit – IV

Transportation – road ways, rail ways, waterways and airways accommodation – types – Organizations and management.

Unit – V

New policy on tourism management strategy – tourism policy analysis – tourism legislation.

Reference text

1. Successful tourism management - Pran Nath Seth - sterling publishers pvt ltd.
2. Tourism management - A.K. Bhatia - sterling publishers pvt ltd.

Semester – III
Non Major Elective
HOSPITALITY MANAGEMENT – I

Unit – I

Hospitality and over view- meaning of hospitality – growth of hotel industry- growth of hotels in India – scope and significance of hotel industry – classification of hotels – types of rooms – department of large hotel.

Unit – II

Front office operations – the functions of the front office – sections of front office – front office organization – lobby – reservation – check in check out procedures.

Unit – III

Housekeeping operations – functions of housekeeping - personal of qualities of housekeeping personal - cleaning procedure – interior decoration – flower arrangements.

Unit – IV

Catering operations – styles of catering – types of plan – classification of catering establishments .

Unit – V

Hotel management – management issues – training for hotel management – forms of hotel ownership – financial management

Reference text

1. Hospitality management – Dr. O. Reegan, cn publication, kottaram.
2. Front office management – S.K.Bhatnagar, frank brothers & co publishers.
3. Accommodation operation management – S.K.Kaushal, frank brothers & co publishers.

(OR)

Semester - III

Non major elective

Bakery and confectionery – 1

Unit – I

Bakery

Wheat – type, grading varieties, structure, composition, principles of flour milling, air classification

Flour – types of flour, composition, role of constituents, quality assessment (biscuit, cake, pastry, self-rising flour, whole wheat flour)

Unit – II

Other ingredients and there functions in baking

Yeast: types, functions, uses effects of over and under fermentation

Eggs – composition, functions of bakery,

Sugar – types deferent forms, uses.

Fats – composition, classification, function, effect of cooking.

Milk and milk products, emulsifiers, dried fruits, enzymes, cream, other living agents.

Unit – III

Baking process

Baking process: basic concepts batch or continue dough mixing, dividing, molding, proofing, baking, formation and expansion of gases rapping of gases in air cells. Coagulation of protein, gelatinization of starches, evaporation of water, melting of shortening, browning of the sugar.

Stilting – protecting a product from air, adding moister retainer to the formula, freezing.

Unit – IV

Cakes

Preparation of cake: deferent methods

Preparation of biscuits, cookies and its types

Unit - V

Bakery

Machinery and equipment

Bakery machinery and equipment – bulk handling, mixers, moulding, cuttings, ovens, packaging.

Reference text

1. Kent N.L. technology of cereals with special references of wheat. Newark.

Semester – III & IV

PRACTICAL - FOOD PRODUCTION AND PATISSERIE – II

Quantity kitchen (INDIAN)

To formulate 15 sets of menu consisting of 5 dishes from the following regions:

1. Andhra Pradesh
2. Bengal
3. Chettinad
4. Goa
5. Gujarat
6. Kashmir
7. Karnataka
8. Kerala
9. Maharashtra
10. Punjab
11. Rajasthan
12. Tamil Nadu

Note: the menu should consists of rice, Indian breads, chicken/mutton/fish/salads/vegetable and a sweets.

More weightage given to chettinad & kerala.

INTERNATIONAL CUISINE (INDIVIDUAL)

To formulate 15 sets of menu consisting of 4 dishes from the following countries mentioned below:

1. American
2. Chinese
3. Germany
4. Greece
5. Holland
6. Indonesia
7. Italian
8. Japanese
9. Malaysian
10. Mexican
11. Portugal
12. Scandinavian
13. Spain
14. Thai
15. Turkey

BAKERY(Demonstration)

To formulate 10 sets of bakery dishes consisting of 4 items from the below for each practicals:

1. Pizza
2. French bread
3. White bread
4. Italian bread
5. Vienna bread
6. Muffins
7. Sourrye
8. Baba/ Savarin dough

9. Brioche
10. Croissant
11. Danish Pastry
12. Double Knot roll
13. Braided roll
14. Eight roll
15. Kaiser roll
16. Butterflake roll
17. Danish spiral
18. Coffee cake (Wreath/Filled/Danish pockets/Braided loaf)
19. Biscuits (Any two variations)
20. Scones
21. Doughnuts
22. Fruit tart
23. Frangipane tart
24. Lemon tart
25. Pinwheels
26. Cream horns
27. Profitroles
28. Apple pie
29. Yellow butter cake
30. Swiss roll
31. Genoise sponge
32. Petit four
33. Checkerboard cookies
34. Almond Macaroons
35. Jam buns
36. Madeleines
37. Pineapple upside down cake
38. Black forest cake
39. Christmas cake
40. Cheese straws
41. Chicken Vol au vent
42. Melting Moments
43. Almond Bonbons
44. Brandy snaps
45. Marshmallows
46. Date Fudge
47. Chelsea bun
48. Banana bread
49. Cinnamon rolls
50. Cherry cake

REFERENCE TEXT:

1. Cooking with Indian Masters – J. Inder Singh Kaira & Pradeej Das Gupta.
2. A Taste of India – Madhur Jaffery.
3. Flavours of India – Madhur Jaffery.
4. Cooking Delights of the Maharajas – Digvijay Singh.
5. Rotis & Naans of India – Purobi Babber
6. The Indian Menu Planner (Lustre) – Welcomgroup Chefs.
7. Food Heritage of India – Vimala Patil.
8. The Professional Chef (IV Edition) – Le Roi A. Polsom.
9. Larousse Gastronomique – Cookery Encyclopedia – Paul hamyln.
10. Professional Cooking – Wayne Gisslen
11. The Complete Guide to Art of Modern Cookery – Escoffier.
12. Modern Cookery (Vol I & II) For Teaching & Trade – Thangam E. Philip.
13. The Cookery Year – Readers Digest Association Ltd.
14. Italian Cooking For Pleasure – Mary Reynolds.
15. Cook Book (Food for family & friends) – Madhur Jaffery.
16. Practical Professional Cookery – Cracknell &Kaullmann.
17. Contemporary Cookery – Caserani & Kinton and Foskett.
18. The Cooking of India – Time Life Service.
19. Classical Recipes of the World – Henry Smith.

Semester – III & IV

Allied practical **FOOD AND BEVERAGE SERVICE – I**

1. Appraising and drawing of cutlery, crockery, glassware and miscellaneous equipment's.
2. Serviette folds.
3. Laying and relaying of table cloths.
4. Cleaning and polishing/wiping of cutlery, crockery glassware.
5. Carrying a light tray.
6. Carrying a heavy tray.
7. Carrying glasses.
8. Handling cutlery and crockery.
9. Manipulating service spoon and fork.
10. Service of water.
11. Arrangement of side board.
12. Table d' hote cover laying.
13. A la cart cover laying.
14. Practice of simple menu compilation.
15. Receiving the guest, presenting the menu, taking orders.
16. Service hors d oeuvre.
17. Service of soup.
18. Service of main course.
19. Service of salads.
20. Service of sweet.
21. Service of chees.
22. Service of non – alcoholic drinks.
23. Continental breakfast cover and tray setup.
24. English breakfast cover and tray set up.
25. Taking orders through telephone for room service.
26. Changing ashtray during room service.
27. Presenting the bill.

SEMESTER – IV
Core subject
FOOD PRODUCTION & PATISSERIE – IV

UNIT – I

Basic principle of baking

Formulas & Measurement – Measurement, procedure for using a baker's balance scale, baker's percentages.

Gluten – Meaning, baker control of gluten.

The baking process – Formation & expansion of gases, trapping of gases in air cells, coagulation of proteins, gelatinization of starches, evaporation of water, melting of shortenings, browning of the sugar & crust formation.

Staling – Protecting the product from air, adding moisture retainer to the formula, freezing.

UNIT – II

Breads – Types, mixing methods (straight dough method, modified straight dough method for rich dough, sponge method), Steps in dough production.

Dough formulas & techniques – Hard rolls, soft rolls, French bread, white pan bread, rye bread & rolls, brioche, sweet roll dough products.

Make-up techniques – Hard rolls & breads, soft roll dough, sweet dough products, rolled in dough products.

UNIT – III

Sponges: Preparation methods, types.

Icings: Types (Fondant, butter creams, foam, flat, fudge, royal icings, marzipan, tragacanth, meringues), glazes, fillings.

Assembling a icing cakes: Selection of icing, procedure for assembling layer cakes, small cakes and sweet cakes.

UNIT – IV

Cake decoration: Colour, design, templates, texture, equipment, casting moulds, lettering, monogram, stencils.

Cookies: Characteristics & causes, mixing methods, types & make-up, panning, baking and cooling, formulas for bar cookies, macaroons, lace cookies & sandwich cookies.

Pies: Types, mixing pie dough, pie crusts, procedure for making small fruit tarts, assembling, baking & filing, common problems in fruit pies.

UNIT – V

Tarts & tartlets: Preparation & types.

Puff pastry: preparation & types.

Sweet meats: Truffles, Fondants, Glaced petit fours.

Chocolate: Manufacture & processing of chocolate, types & uses of chocolate, cocoa butter, white chocolate, liquor chocolates, fondant chocolates & toffies.

REFERENCES TEXT:

1. Professional Baking – Wayne Gisslen – John Wiley & Sons.
2. The New International confectioner – Edited by Wilfred J. Franc
3. Practical Baking – William J. Sultan.

SEMESTER – IV

Major Elective

FRONT OFFICE MANAGEMENT – II

UNIT – I

Front Office Salesmanship: Upgrading; Front Office reception as a sales department: guidelines to selling – by telephone, face to face; selling to the business person, conference and group business – How to compete in the market.

Guest relation and social skills: The role of Guest relations officer; types of guest problems; skills necessary for dealing with problems; solving problems; handling complaints; course of action to take when handling problems; follow up action; telephone handling skills.

UNIT – II

Flow of guest information between sections of front office and other departments: importance of log book; reservations; reception; mail and information; bell desk; front office cashier; telephones; housekeeping department; sales department; engineering department; accounts department.

Information/bell desk / concierge: Functions of the information department; handling guest mail and messages; registered and insured mail; guest tickets and special requests; information binder; Lobby hierarchy; duties of the bell desk; luggage handling; vending stamps; scanty luggage guest; control on bell captain; concept of concierge.

UNIT – III

Function of Front Office Accounting systems: guest accounting cycle; the check out procedure; settlement of guest accounts; late check outs, methods of accounts settlement and procedure for accepting such settlements.

Cash settlement – local currency, foreign currency, travellers cheque, personal cheque, bank credit cards; Credit settlements; settlement of corporate account; travel agents vouchers.

Creating a good and lasting impression; updating front office records.

Room status / room rack; alphabetical guest register; arrival / departure register; departure information notice; guest history cards

UNIT – IV

Credit control: Meaning; objectives; hotel credit control policy; accounts settled by credit card or charge card; credit control measures required when receiving reservations; credit control measures at check-ins; credit control measures during occupancy; credit control measures by other sales department; credit control measures at check-out; credit control measures after guest departure; preventing walk-outs.

UNIT – V

Forecasting: Importance of forecast how to forecast, useful forecasting data: format of reservation forecast; calculation of reservation forecast (room revenue).

Tariffs: Establishing room rates; the rule of thumb approach; Hubbart formula, differential room rates, seasonal rates.

Yield management: Concept of yield management; hospitality application; measuring yield; formulas.

Differential rates – potential average single rate, multiple rate, potential average double rate multiple occupancy percentage, rate spread, potential average rate, room rate achievement factor. using booking forecast, to maximize yield; multiple rates, displacement of transient business.

REFERENCE TEXT:

1. Basic Hotel Front Office Procedures – Peter Renner – Van Nostrand Reinhold.
2. Managing Front Office Operations – Michael L. Kasavana – Education Institute AHMA.
3. Hotel & Motel from Desk Personnel – Grace Paige and Jane Paige – Van Nostrand Reinhold.
4. Principles of Hotel Front Office Operations – Sue Baker, Pam Bradley & Jeremy Huyton – Cassell.
5. Front Office Procedures, Social Skills and Management – Petrabbol & Sue Lowry – Butterworth Huneman.

Semester – IV

Allied paper

FOOD AND BEVERAGE SERVICE – II

Unit – I

Breakfast: types, menu for each type, terms used in the terms of continental breakfast. Cover laying for continental and English breakfast.

Order taking procedures: in- person, telephone and door hangers.

Unit – II

Types of service: different styles of services, factors influencing each type, table layout for different styles, advantages and disadvantages, styles of service often implemented these days.

Unit – III

Classification of beverages: types of beverages, preparation of common non-alcoholic beverages. Examples tea, coffee, milk based drinks, juice, squash and aerated water, and bar non-alcoholic drinks used in dispense and main bar.

Unit – IV

Potato preparation – styles.

Salads – types, classical salad dressing and salads. Methods of dressing salads.

Unit – V

Cheese – type and characteristics of English and European cheeses, cover and its accompaniments.

Savoury – types, examples for each types, cover laying and its accompaniments.

Ice-creams – categories of ice-creams – sundae, parfait, biscuits, bombes, and its cover laying.

Sweets – meaning of bavoroise, mousse; flan, soufflé, custard, jellies, fools – cover laying, styles of presenting sweets.

Dessert – fruits and nuts – cover and accompaniments.

Reference text:

1. The waiter – John Fuller & A J Currie – Hutchinson
2. Modern restaurant service, a manual for student & practitioner – John Fuller - Hutchinson
3. Food and beverage service - Dennis R. Lillcrap & John A. Cousins – ELBS.
4. Food and beverage service training manual – Sudhir Andrews.

SEMESTER – IV

Skilled based Subject: **COMPUTER APPLICATIONS IN HOTEL INDUSTRY**

UNIT – I

Computer Appreciation and Dos: Introduction – Characteristics, History, Generations, Classifications, Applications of computer – Hardware and Software – Operating systems – Computer languages.

DOS file: Directory – Changing the directory – Creating a new directory – Copying files – Deleting files – Changing file name – Data and time – Type – Print.

UNIT – II

Windows 2000: Windows Basics – Introduction – Starting windows – Using mouse – Moving & Resizing windows – Maximizing, minimizing and restoring windows – Using menu in windows.

Word: Introduction to word – Editing a document – Move and copy text and Help system – Formatting text & paragraph – Finding & replacing text and spell checking – using tabs – Enhancing documents – Columns, tables & other features. Using Graphics, Templates & Wizards – Using mail merge – Miscellaneous features of word.

UNIT – III

Introduction to worksheet & excel – Getting started with excel – Editing cells and using commands and functions – Moving and copying, Inserting and deleting rows & columns – Getting help and formatting a worksheet- Printing the worksheet – Creating charts – Using date and time and addressing modes – Naming ranges and using statistical, math and financial functions.

Database in a worksheet – additional formatting commands and drawing tool bar – miscellaneous commands and functions – multiple worksheets and macros.

UNIT – IV

Power point basics – editing text – adding subordinate points – deleting slides – working in outline view – using a design template – merging presentation in slide sorter view applying templates – adding graphs – adding organization charts – running an electronic slide show – adding special effects.

UNIT – V

Access Basics – creating a table – entering and adding records – changing a structure – working with records – creating forms – establishing relationships using queries to extract information – using reports to print information.

REFERENCE TEXT:

1. PC Software for Windows Made Simple – R.X. Taxali – Tata McGraw Hill.
2. PC Software for Office Automation – Karthikeyan & Dr. C. Muthu – Sultan Chand.
3. Office 2000 complete reference – Stephen L. Nelson – BPB.
4. Quick course in Microsoft office – Joyce Cox, Pully Urban – Galgotia Publications.
5. Mastering Office 2000 – Gini Courter, Annette Marquis – BPB.

Semester – IV

Non Major Elective Paper – II

HOSPITALITY MANAGEMENT – II

Unit – I

Hospitality industry – introduction & growth. Organization of hotels based on location, size, and length of stay of guest other types of accommodations, bungalow, youth hostel, types of ownership sole proprietorship and partnership organizational structure of various kinds of hotels.

Unit – II

Introduction – housekeeping, layout, organization structure, hotel linen – classification items classified as bed and bath linen and other sizes. Selection criteria for linen items linen functions and its uses.

Unit – III

Introduction to front office. Front office organization duties and responsibilities. Attitudes and attributes of front office staffs. Types of rooms – single, double, twin suites, pentouses, cabana etc. types of plan – EP, CP, AP, and MAP.

Unit – IV

Reservation and reservation enquiry sources of reservation types of reservation confirmation forecasting system, VIP lists, amenities, vouchers arrival & departure register guest history cards.

Unit – V

Rules of guest floor. Bed making key handling procedure types of key standard supply provide on guest rooms. Special service. cleaning procedure and frequency methods.

Reference text

1. Hospitality management – Dr. O. Reegan, cn publication, kottaram.
2. Front office management – S.K.Bhatnagar, frank brothers & co publishers.
3. Accommodation operation management – S.K.Kaushal, frank brothers & co publishers.

(OR)

Semester - IV

Non major elective

BAKERY AND CONFECTIONERY – 11

Unit – I

Commercial bread making methods

Recent advances, chemical dough development, mechanical development. Methods of preparing bread and bread rolls. Evaluation of bread and quality control

Methods of preparation of pizza.

Unit – II

Microbial aspect of different bakery products

Prevention of bacterial rope and mould infection.

Unit – III

Pastries – types, recipes for shortcut cut pastry, buff pastry, sweet pastry, suet pastry.

Reason for fault in the above preparation.

Unit – IV

Tarts and tartlets – preparation and types.

Chocolate – manufacture and processing of chocolate,

Types and uses of chocolate, cocoa, white chocolate.

Unit – V

Bakery

Machinery and equipment

Bakery machinery and equipment – bulk handling, mixers, moulding, cuttings, ovens, packaging.

SEMESTER – V

Core subject

FOOD PRODUCTION & PATISSERIE – V

UNIT – I

Larder: Essential of larder control, Importance and functions of larder in main kitchen, relationship with other section of main kitchen Duties and responsibilities of Larder chef, Equipment and tools used in larder, Floor plan or layout of a larder?

UNIT – II

Force meat: Meaning, uses, (types and recipes)

Panada: Meaning, uses, types and recipes.

Compound butters: Meaning, uses, types and recipes and examples.

Marinade: Different types and uses.

Brine: Types and uses

Aspic jelly: Uses and Preparation.

Chaud Froid: Uses and Preparation.

Sauces: Types and preparation

UNIT – III

Garnishes: Importance, names of garnishes used with soup, fish, beef, veal, poultry and game.

Cold Preparation: Galantine, Ballotine, Terrine, Pate terrine, mousse, soufflé, mousselines, quenelles, etc. Recipes for the above.

Ice carving: Equipment, ice preparation, making a template, melting effects, storage.

UNIT – IV

Kitchen organization: Allocation of work – Job description/ Duty rosters, production planning production scheduling, production quality & quantity control, forecasting, budgeting.

Kitchen stewarding: Importance of Kitchen stewarding, Organization of the kitchen stewarding department, equipments found in kitchen stewarding department, work flow in kitchen stewarding, garbage disposal.

UNIT – V

Kitchen Management: Objectives, Meal production, Indenting, purchasing, storing, control, yield, portion control.

Standard Recipe – Importance of standard recipe. Advantages and disadvantages, Left over utilization.

REFERENCE TEXT:

1. Practical cookery – Ronald Kinton & Victor Ceserani – Hodder Starghton.
2. Theory of Catering – Ronalk Kinton & Victor Ceserani – Hodder Starghton.
3. Food & Beverage Management – Bernard Davis & Sally stone – ELBS.

4. The Professional Chef (IV Edition) – Le Roi A. Polsom.
5. Larousse Gastronomique – Cookery Encyclopedia – Paul Hamyln.
6. The Book of Ingredients – Jain Grigson.
7. Professional Cooking – Wayne Gisslen.
8. The New Catering Reporter (Vol.I) – H.L Cracknell and G. Noble.
9. The Cookery Year – Readers Digest Association Ltd.
10. The Complete Guide to Art of Modern Cookery – Escoffier.

SEMESTER – V

Core subject

FOOD & BEVERAGE SERVICE – III

UNIT – I

Cocktail – Meaning, Method of mixing cocktail – Points observed while making cocktail – Types of cocktail – Meaning of blended drinks, champagne cocktails, cobbler, Collins, coolers, crustas, cups, daiquiris, daisies, egg noggs, fixes, fizzes, flips, frappes, high ball, juleps, pick-me-ups, pousse café, punches, sangarees, smashes, sours, swizzles and toddies. Recipes of whisky, rum, gin brandy, vodka, tequila based cocktails and mocktails (Given in the Food & Beverage Service – Dennis R. Lillicrap & John A Cousins – Sixth Edition only)
Liqueur / Spirit coffee: Irish coffee, Scandinavian coffee, Monk's coffee, Normandy coffee, Royal coffee, Prince Charles Coffee, Dutch coffee, Mexican coffee, German coffee, Italian coffee, Royal mint coffee, Caribbean coffee, Gfaelic coffee, Calypso coffee.

UNIT – II

Tobacco – Important tobacco producing countries of the world, Quality cigars and cigarettes served in hotel. Strength and size of cigars, Storage of cigars and cigarettes. Afternoon tea service: Menu for High tea & Afternoon tea, cover for High tea & Afternoon tea, order of service, Reception tea service.

UNIT – III

Checking, control and billing: Introduction & checking system, types of checking carbon copies, triplicate system of checking, checking for wines & other drinks, checks for still room and other services.

Types of checks: Return check, En place check, En suite check, Extra charge, No charge & cancellation checks.

The Bill – methods of making the bill & settling the account.

UNIT – IV

Floor/Room service: Meaning, Full & Partial room service, Breakfast service in the room, tray set-up, facilities in room.

Lounge service: Meaning, organization of lounge service.

UNIT – V

Dispense bar: Meaning, glassware & equipment's used in the dispense bar, Garnishes & kitchen supplies used in the dispense bar.

Bar design: Space requirements, stocking of alcoholic drinks & beverages. Bar control.

REFERENCE TEXT:

1. Modern Restaurant Service, A manual for students & Practitioners – John Fuller – Hutchinson.
2. Food & Beverage Service – Dennis R. Lillicrap & John A. Cousins – ELBS.
3. Food & Beverage Service Training Manual – Sudhir Andrews – Tata McGraw-hill.
4. The Student Guide to Food & Drink – John Cousins & Andrew Durkan – Hodder & Stoughton.
5. The Beverage Book – Andrew Durkan & John A. Cousins – Hodder & Stoughton.
6. Table & Bar – Jeffery Clarke

Semester – V
Core subject
HOTEL ACCOUNTING

Unit – I

Fundamentals of book keeping – accounting concepts & conventions – journal – ledger – subsidiary books.

Unit – II

Preparation of trail balance – preparation of final accounts – trading and profit & loss accounts – balance sheet with simple adjustments.

Unit – III

Banking – introduction – pass books – Cheque – types of crossing.
Bank re consolation statement: meaning, preparations, causes of difference, presentation.

Unit – IV

Classification of departments of hotel based on revenue.
Hotel accounting methods – ledger – revenue generation of various departments.
Internal audit and statutory audit: an introduction to internal and statutory audit, distinction between internal audit and statutory audit, implementation and revenue of internal audit.

Unit – V

Cost accounting – meaning – definition – preparation of cost sheet – method of pricing of stock issue.

Accounting Machines & their importance in catering business.

Note: the theory and problems must be given equal preference in the question paper.

Reference text

1. Double entry book keeping – T.S.Grewall
2. Cost accounting principles and practice – S.P.Jayan
3. Bookkeeping hotel and catering industry – Richard kotas.

SEMESTER – V
Major elective paper
FOOD & BEVERAGE MANAGEMENT

UNIT – I

Food & Beverage Management: Introduction – Food & Beverage function – Responsibilities & objectives of F & B department – Constraints of food & beverage management – Cost & market orientation (Cost structure & profitability, demand for product, capital intensity, nature of the Product).

The meal / drink experience: Food & drink, variety in menu choice, level of service, value for money, interior design, atmosphere & mood Expectation & identification, location / accessibility and staff.

UNIT – II

Purchasing: The nature of purchasing – The main duties of purchase manager- Importance of purchase functions – The purchasing procedure – The selection of a supplier – supplier rating – Aids to purchasing – The purchasing of food & beverages. Standard purchase specification: Meaning & Objective – The purchase specification for food & beverages. Receiving: Objective – Receiving procedure – Receiving of expensive commodities – Returnable containers – Blind receiving – Dispatch to stores or user department – Clerical procedures & forms used.

UNIT – III

Storing & issuing: Storing & issuing of food & beverages.

Stock taking of food & beverages – Stock turnover – Stock levels.

Food control: Objectives of food cost control – The essentials of a control system – Calculation of food cost – Methods of food control – Food control check list – Obstacles to food cost control.

Beverage control: Objectives of beverage control – Calculation of beverage cost – Methods of beverage control – Beverage control checklist.

UNIT – IV

Element of cost: Cost defined, basic concepts of profit, control aspect, pricing aspects. Cost

dynamics: Fixed & variable costs – Break even chart – Turn over & unit costs. Variance

analysis: Standard cost – Standard costing – Cost Variances – Material Variances – Overhead variances – Labour variances – Fixed overhead variances – Sales variance.

UNIT – V

Selling: The pricing problem – Pricing objectives – 4 pricing problems – Practical applications of pricing – Fixed selling price – En pension terms – Control of cash & credit sales – Control by selling price – Aids to pricing.

Sales Control: Manual system and Machine system.

Operating yard stick: Total food & beverage sales – Departmental profit – Ratio of food &

beverage sales – Departmental profit – Ratio of food & beverage sales to total sales – Average

spending power – Sales mix – Payroll costs – Index of productivity – Stock turnover – Sales per seat available – Rate of seat turnover – Sales per waiter.

REFERENCE TEXT:

1. Food & Beverage Management – Bernard Davis & Sally Stone – ELBS.
2. Profitable food & Beverage Management – Richard Kotas & Chandana Jayawardena – Hodder & Stoughton.
3. Food Cost Control – Richard Kotas & Bernard Davis – International Text Book Company.
4. Food Costing & Budgeting – Boardman – Heinemann.
5. Food & Beverage Operations – David Fearn – Newnes, Butterworth.
6. Cost Accounting, Principles & Practice – S.P Jain & K.L. Narang – Kalyani Publishers.
7. Food & Beverage Operations, Cost control & System Management – Charles Levinson, Prentice Hall.
8. Principles of Food, Beverage and Labour Cost Control – Paul R. Dittmer – John Wiley & Sons.

Semester – V
PRACTICAL - FOOD PRODUCTION & PATISSERIE – III

DEMONSTRATION ON THE FOLLOWING

- a) Ice carving
- b) Vegetable carving
- c) Butter carving
- d) Aspic Jelly preparation and presentation
- e) Force meat
- f) Panades
- g) Galantine
- h) Ballotine
- i) Pate terrine

CONTINENTAL CUISINE (INDIVIDUAL)

To formulate 10 sets of menu consisting of 6 dishes from the following courses mentioned below:

1. Hors – Doeuvre – Simple or Compound
2. Soup
3. Egg
4. Pasta/rice
5. Fish
6. Mutton/Veal/Beef/Pork
7. Poultry/Furred game/Feathered game
8. Potatoes
9. Vegetables/Salads
10. Sweet
11. Savoury

REFERENCE TEXT:

1. Practical cookery – Renald Kinton & Victor Ceserani – Hodder Starghton.
2. The Professional Chef (IV Edition) – Le Roi A. Polsom
3. Larousse Gastronomique – Cookery Encyclopedia – Paul Hamyln.
4. Professional Cooking – Wayne Gisslen
5. The Complete Guide to Art of Modern Cookery – Escoffier.
6. The Cookery Year – Readers Digest Association Ltd.
7. Practical Professional Cooker – Cracknell & Kaullmann
8. Contemporary Cookery – Caserani & Kinton and Foskett.

Semester – V
PRACTICAL - FOOD & BEVERAGE SERVICE – II

1. Recollecting II year portions.
2. Preparing duty rotra.
3. Banquets:
 - a) Booking procedure
 - b) Preparing banquet menus
 - c) Space area requirements
 - d) Service toasting
- e) Informal banquets (Viz., Reception, Cocktail parties, Seminar, Exhibitions Fashion shows, Trade fair, Wedding, Outdoor catering etc.)

4. Buffers:
 - f) Area requirements
 - g) Planning & Organization
 - h) Sequence of food (Indian & Continental)
 - i) Types of buffet display
 - j) Equipment supplies
 - k) Checklist
5. Gueridon Service:
 - l) Types of trollies
 - m) Gueridon equipement
 - n) Gueridon ingredients
 - o) Service of courses and dishes from Gueridon.

Semester – VI
INDUSTRIAL EXPOSURE TRAINING

The students will be required to undergo 3 months Industrial Exposure Training in 3,4,5 star hotels in Kitchen or F&B service or Housekeeping or Front Office Department.

At the end of the Industrial Exposure Training (IET), students should prepare an IET report on the area where training is obtained and submit two typed computer processed copies to the Head of the Department. The IET will carry a total of 100marks including the report carrying 75 marks and a viva at the end of fifth semester is carrying 25 marks. The report will be assessed by the internal teacher and on the basis of the certificate of the teacher concerned that the report has been satisfactorily completed, would the student be granted as having partially fulfilled the degree program.

Core subject
HUMAN RESOURCE MANAGEMENT

UNIT – I

Human Resource Management – Meaning nature, scope and objective – Function of HumanResource Department – The role of HR Manager – Organization of HR Department – HR polices & procedures.

UNIT – II

Manpower is planning – Concept, organization & practice, Manpower planning techniques – Short term and long term planning. Recruitment & Selection – Job analysis – Description – Job specification – selection process – Tests & Interviews – Placement & Induction.

UNIT – III

Performance appraisal – Job evaluation & merit rating – Promotion – Transfer and demotion – Human relations – Approaches to good human relations – Job satisfaction – morale and discipline – Labour turnover – Punishment.

UNIT – IV

Wages and salary administration – Development Sound Compensation structure, Direct & Indirect costs, Fringe benefits, CTC (Cost to Company) Concepts & its implications – Regulatory provisions – Incentive system – Labourwelfare and social security – Safety health & security – Retirement benefits to employees.

UNIT V

Industrial relations – Trade unionism – Grievance handling – Developing Grievance Handling System – Managing conflicts – Collective bargaining and workers participation.

REFERENCE TEXT:

1. Personnel Management – C.B. Mamoria – Himalaya Publishing House.
2. Personnel Management in Indian Organizations – Pramod Verma.
3. Personnel Management – Edwin B. Flippo – Tata McGraw Hill.
4. Personnel Management

PRAC – FOOD & BEVERAGE SERVICE – II

1. Recollecting II year portions.
2. Preparing duty rota.
3. Banquets:
 - a) Booking procedure
 - b) Preparing banquet menus
 - c) Space area requirements
 - d) Service toasting
 - e) Informal banquets (Viz., Reception, Cocktail parties, Seminar, Exhibitions Fashion shows, Trade fair, Wedding, Outdoor catering etc.)
4. Buffets:
 - f) Area requirements
 - g) Planning & Organization
 - h) Sequence of food (Indian & Continental)
 - i) Types of buffet display
 - j) Equipment supplies
 - k) Checklist
5. Gueridon Service:
 - l) Types of trollies
 - m) Gueridon equipment
 - n) Gueridon ingredients
- o) Service of courses and dishes from gueridonement & Industrial Relations – Tripathi – Sultan Chand & Sons.

Semester – V & IV

Practical-front office management

Topics to be handled in practical classes

1. Telephone handling skills.
2. Reservation procedures.
3. Identification of rooms through the use of conventional and density charts (the students must be provided with different charts and problems to be given)
4. Check-in and check-out procedures.
5. Dealing with guest mail and messages, hotel mail and staff mail
6. Modes of bill settlement.
7. Handling guest complaints and solving problems.
8. Places of interest in and around Tamil Nadu.
9. General awareness about places of interest in India with importance given to wild life sanctuaries, bird sanctuaries, zoos, hill resorts, beach resorts, places of work ship, places, forts, museums, galleries, and national and international airports in India.
10. Calculation of statistical information
 - a) House count, b) room position, c) percentage of room occupancy, d) percentage of single occupancy, e) percentage of double occupancy f) Percentage of early departure, g) Percentage of late departure, h) Percentage of early arrivals
 - vii) Percentage of no-shows
 - vii) Average room rate
 - viii) Average room rate per person
12. General awareness of capitals, currency and airlines of countries.

Reference text

1. Basic hotel front office procedure – Peter Renner – van Nostrand Reinhold.
2. Meaning front office operations – Michael I. Kasavana – Education Institute AHMA.
3. Manorama year book (new edition)
4. Any tourist guides of Tamil Nadu & India.

SEMESTER IV

	Components	Hours	Credits
Part-III	T16 - Core: Theory: Linear Integrated Circuits	6	4
Part-III	T17 - Major Elective: Computer Networks	6	5
Part-III	MP4 - Practical: Linear Integrated Circuit	6	4
Part-III	Allied II: T18 - Theory Paper : Digital Electronics AP2 - Practical II : Basic Electronic Devices and Digital Circuits	4 2	4 2
Part-IV	T19 - Skill Based Subject (II): Electrical Machines	4	4
	T20 - Non Major Elective (II): Television (or) Radar	2	2
Part-V	Extension activity	-	1
	Total (Total Papers – 7 - 5 Theory + 2 Practical)	30	26

SEMESTER V

	Components	Hours	Credits
Part-III	T21 - Core : Theory: Microprocessor	4	4
Part-III	T22 - Core : Theory: Medical Electronics	4	4
Part-III	T23 - Core : Theory: Mathematics for Electronics	4	4
Part-III	T24 - Major Elective: Theory XI : Television Engineering	6	5
Part-III	MP5 – Practical: Microprocessor	8	4
Part - IV	T25 - Skill Based III (Subject): Personality Development (or) Effective Communication	4	4
	Total (Total Papers – 7 - 5 Theory + 2 Practical)	30	25

SEMESTER VI

	Components	Hours	Credits
Part-III	T26 - Core: Theory: Communication System	4	4
Part-III	T27 - Core: Theory: Industrial Electronics	4	4
Part-III	T28 - Core: Theory: VLSI Design	4	4
Part-III	T29 - Core: Theory: Robotics	4	4
Part-III	MP6 - Practical: Electronic System Design	8	4
Part-III	T30 - Major Elective: Fibre Optic Communication	6	5
	Total (Total Papers – 7 - 5 Theory + 2 Practical)	30	25

Total number of courses : 38 (30 Theory + 8 Practical)
 Total number of hours : 180
 Total number of credits : 140

Note: Distribution of marks in Theory between External and Internal Assessment is 75:25

For practicals – 60:40

Pass mark: Minimum of external and overall components.

Appropriate Major / Allied related, ‘Allied Courses’ and ‘Skill based courses’ may be chosen by the Major departments, taking into account the total work load of the department.

Abbreviations: T – Theory, MP – Major Practical, AP – Allied Practical

III SEMESTER

T11 Core Theory

ELECTRONIC CIRCUITS

UNIT I:

Rectifiers – Half wave rectifier, bridge rectifier, Inductor – Capacitor - L type filters – Ripple factor – Voltage regulator (series type) – Current limit over load production – Introduction to IC fixed and variable IC723, 78XX, 79XX voltage regulators - Formulas value substitution problems.

UNIT II:

Amplifiers - General principle of operation – Classification of amplifiers – Classification of distortion (amplitudes, frequency, phase) – RC coupled amplifiers – Gain – Frequency response – Input and output impedance - Multistage amplifiers - Transformer couple amplifiers - Frequency response – Formula value substitution problems.

UNIT III:

Introduction – Classification power amplifier – Class A power amplifier – Class A push pull amplifier – Class B power amplifier – Class B push pull amplifier – Class C power amplifiers - Class C push pull amplifiers - Power dissipation output power – Distributors – Formula value substitution problems.

UNIT IV:

Feed back - Basic concepts – Characteristics - Effect of negative feedback - On gain – Stability distortion – Bandwidth – Analysis of voltage and current feedback amplifier circuits - Formula value substitution – Problems.

UNIT V:

Classification of oscillators-use of positive feedback - Barkhausen criterion for oscillation – Colpitts oscillator – Hartley oscillator – Wein bridge oscillator - Phase shift oscillator - Crystal oscillator - Frequency stability of oscillators - Multivibrators (mono, astable, bistable) - Formula value substitution problems.

Books for Study and Reference:

1. Electronic devices and circuits – Millman & Halkias, 2nd edition, Tata McGraw-Hill, India, 2008.
2. Electronic devices and applications and integrated circuit, Mathu.
3. Basic Electronics, B.L. Theraja, 5th edition, S. Chand & Co. Ltd., India, 2007.
4. Electronic devices and circuits, G.K. Mithal, Khanna publishers, India, 2008.
5. Electronic devices and circuits, Allen Mottershead, 1st edition, Prentice Hall of India Learning, India, 2011.
6. Problems and solutions of electronic devices and circuits, Experience teachers CBS publication, New Delhi.

III SEMESTER**T12 Core Theory****ELECTRONIC MEASUREMENTS AND CIRCUIT THEORY****UNIT I:**

Measurements - Errors in measurements – Standards - Classification characteristics of Transducers, AC/DC Bridge measurements and their applications.

UNIT II:

A.F Spectrum analyzer – Digital Voltmeters and Multimeters, AC voltmeter - Vector voltmeter - CRO Block Diagram – Single beam - Dual trace - Sampling oscilloscope, Analog – Digital recorders and printers.

UNIT III:

Ohms Law – Kirchoff's Laws and their applications – Branch and loop current - Mesh and node analysis.

UNIT IV:

Fundamental ideas of AC circuits – Impedance of RL, RC, RLC circuits - Resonance in AC circuits – Series and parallel single tuned and double tuned co-circuits.

UNIT V:

Network graph of a network – Concept of tree - Branches and chords dual networks - Networks theorems: Superposition, Thevenin Norton maximum power transfer Theorem.

Books for Study and Reference:

1. Instrumentation devices and systems, C.S. Rangan, 5th edition, Tata McGraw-Hill, India, 1998.
2. Electronic instrumentation and measurement techniques, Copper, Prentice Hall of India, India, 1989.
3. Digital instrumentation, A.J. Bouwels, McGraw-Hill, India, 1986.
4. Intelligent Instrumentation, C. Barney, Prentice Hall of India, India, 1985.

5. Electronic Measurements and Instrumentation, Oliver & Cope, McGraw-Hill, India, 1975.
6. Measurements Systems, Deobelin, 4th edition, McGraw-Hill, India, 1990.
7. Electronic circuits, Edminister, 5th edition, Tata McGraw-Hill, India, 2011.
8. Circuits and Networks, Analysis and Synthesis, A. Sudakar & S.P. Shyammoan, Tata McGraw-Hill, India.
9. Networks, Analysis and Synthesis, Umesh Sinha, 7th edition, Sathya Prakashan, India, 2010.
10. Electronic circuits Theory, Dr. M. Arumugam & Dr. N. Prem Kumaran, 5th edition, Khanna Publishers, India, 2011.
11. Circuit theory (Electrical circuits), Prof. T. Nageswara Rao, 5th edition, A. R. Publications, India.
12. Circuit theory (Network theory & Design), Umesh sinha, 4th edition, Satya prakashan, India, 1997.
13. Modern electronic instrumentation & Measurement techniques, Albert D. Helfrick & William D. Cooper, Prentice Hall of India, India, 2004.

III SEMESTER

T14 Skill Based

ELECTRICAL INSTRUMENTS AND MEASUREMENTS

UNIT I:

Principle of operation of meters - Essentials of indicating instruments - Deflecting controlling Torque - Damping Torque - Moving iron ammeter and voltmeter - Attracting moving iron instrument – Repulsion type moving iron instrument – Extension of range.

UNIT II:

Moving coil instruments - Permanent magnet type instrument – Advantages and disadvantages of PMMC instrument - Extension of range Electrodynamometer type instruments - Hot wire instruments.

UNIT III:

Megger - Induction Ammeter, Induction voltmeter – Error in Induction Instruments -Advantages and disadvantages - Electrostatic Voltmeters - Attracted disc type volt quadrant voltmeter - Kelvin's Multicellular voltmeter - Advantages and Limitations of Electrostatic Voltmeters - Range extension of electrostatic voltmeters.

UNIT IV:

Wattmeter - Dynamometer wattmeter – Wattmeter errors - Induction wattmeter - Advantages and limitations of induction watt meters - Energy meters - Electrolytic meter - Motor meter- Errors in motor Meters - Induction type single phase watt hour meter – Errors in induction watt - Hour meters.

UNIT V:

Ballistic Galvanometer – Vibration Galvanometer - Vibrating reed frequency meter - Electrodynamic frequency meter - Moving iron frequency meter - Electrodynamic power factor meter - Moving iron power factor meter - Instrument transformers - Current transformer - Clip on type power transformer - Potential transformer.

Books for Study and Reference:

1. A text book of Electrical Technology in S.I units volume-1, B.L. Theraja & A.K. Theraja, 23rd edition, S. Chand & company Ltd, India, 2002.
2. Basic electrical Engg., P.S. Dhogal, Tata McGraw-Hill, India, 1985.

III SEMESTER**MP3 Core Practical III****ELECTRONIC CIRCUITS AND MEASUREMENTS**
(Any 12 experiments and six from each section)**Section – I: ELECTRONICS CIRCUITS**

1. Study and use of CRO.
2. Half wave rectifier and Full wave rectifier.
3. Fixed dual power supply construction using IC's.
4. RC coupled amplifier two stage.
5. FET amplifier.
6. RC phase shift oscillator.
7. Hartley oscillator.
8. Colpitts oscillator.
9. Clipping and Clamping circuits.
10. Monostable multivibrator.
11. Astable multivibrator.

Section – II: MEASUREMENTS LAB

1. Wheatstone bridge.
2. Kelvin double bridge.
3. Maxwell bridge.
4. Hay bridge.
5. Schering bridge.
6. LVDT.
7. Displacement meter.
8. Transducer applications and measurement.
9. Extension of range of PMMC meter.
10. Current measurement using sensors.

III SEMESTER
Allied Electronics subjects for other major students

ELECTRONIC DEVICES

UNIT I:

Resistors – Types – Colour codes – Tolerance – Potentiometer – Thermistor – Negative and positive temperature coefficient – Basic construction of various types of resistors – Capacitors (ceramic, air, mica, polystyrene, electrolytic) – Fixed and variable - Power ratings – Inductors. Various types – Inductors for high frequency applications.

UNIT II:

Atomic structure – Bohr's atomic model – Energy levels – Energy bands – Importance of energy bands in solids – Classification of solids and energy bands – Semiconductors energy band description – Temperature effect – Intrinsic and extrinsic semiconductors – P-type and N-type majority and minority carriers – PN junction.

UNIT III:

Forward, reverse and unbiased PN junction – PN junction diode: Characteristics – Temperature dependence – Static and dynamic resistance – Space charge and diffusion capacitance – Rectifiers: Half wave and Full wave rectifier – Bridge rectifier – Clippers and clampers – Zener diode characteristics – Voltage regulator - LED, LDR and photodiode.

UNIT IV:

Bipolar transistor – UJT – Common Base, Common Emitter & Common Collector characteristics – Transistor load analysis – Operating point – Cut off and saturation point – Power rating – Method of transistor biasing – Bias stabilization – Bias compensation – Thermal run away problem – Transistor as a switch – as a amplifier – SCR.

Unit – V

FET – construction features working Principle - Characteristics – JFET characteristics – JFET as a switch and an amplifier – Biasing – MOSFET - Enhancement and depletion type – Working principle and characteristics.

Books for Study and Reference:

1. Integrated electronics, J. Millman & C. Halkias, Tata McGraw-Hill, India, 1991.
2. Basic electronics: A text lab manual, Zbar, Malvino & Miller, 7th edition, Tata McGraw-Hill, India, 2009.
3. Basic Electronics, B.L. Theraja, 5th edition, S. Chand & Co. Ltd., India, 2007
4. Principle of Electronics, V.K. Metha, 7th edition, S. Chand & Co, New Delhi, 2005.
5. Semiconductor Devices and Circuit, G.K. Mettal, Khanna publishers, India.
6. Micro Electronics, J. Millman & A. Grabel, 2nd edition, McGraw-Hill, New York, 1987.
7. Solid state electronic devices, Ben G. Street man, 5th edition, Prentice Hall of India, India, 2005.

III SEMESTER

Non Major Elective subjects for other major students

Choose any one of the following papers (a) or (b)

(a) ELECTRONIC TROUBLESHOOTING

UNIT I:

Corrective maintenance – Troubleshooting – Repairing troubles - Testing or operational check – Troubleshooting aids – Corrective maintenance time – Intermittent troubles – Precautions while trouble shooting and repair.

UNIT II:

Preventive maintenance – Merits and demerits of preventive maintenance record – Shutdown planning – Calibration – Inspection.

UNIT III:

Classification of printed circuit boards – Manufacturing process – Repair of PCB's.

UNIT IV:

Digital test instruments - Basic digital measurements – Testing digital circuits – Digital equipment service literature – Digital trouble shooting – Use of some test equipments.

UNIT V:

Trouble shooting laboratory and industrial equipments – Power supplies, Oscillators, Function generators – Speed controllers – CRO.

Book for Study and Reference:

1. Maintenance of Electronic Equipments, K.S. Jamwal, 1st edition, Dhannpat Rai & Co, India, 2002.

(b) COMPUTER HARDWARE

UNIT I:

CPU essentials – Processor modes – Modern CPU concepts – Architectural performance features – The INTEL'S CPU.

UNIT II:

Essential memory concepts – Memory organizations – Memory packages – Modules – Logical memory organizations – Memory considerations – Memory types – Memory techniques – Selecting and installing memory.

UNIT – III:

Active motherboards – Sockets and slots – INTEL D850GB – Pentium4 mother board – expansion slots – Form factor – Upgrading a mother board – Chipsets – North bridge – South bridge.

UNIT – IV:

Power supplies power management – Concepts of switching regulation – Potential power problems – Power management.

UNIT – V:

IDE drive standard and features – Hard drive electronics – CDROM drive – Construction – CDROM electronics – DVD-ROM – DVD media – DVD drive and decoder.

Books for Study and Reference:

1. Trouble Shooting, Maintaining and Repairing PCs, Stephen J. Bigelow, 5th edition, Tata McGraw-Hill, New Delhi, 2001.
2. The complete reference: PC hardware, Crig Zacker & John Rourke, 1st edition, Tata McGraw-Hill, New Delhi, 2001.
3. Introduction to PC Hardware and Trouble shooting, Mike Meyers, Tata McGraw-Hill, New Delhi, 2003.
4. IBM PC and Clones hardware trouble shooting and Maintenance, B. Govindarajulu, Tata McGraw-Hill, New Delhi, 2002.

IV SEMESTER**T16 Core Theory****LINEAR INTEGRATED CIRCUITS****UNIT I:**

Differential amplifiers - Dual input - Balance output differential amplifier - Current monitor - Level translator - Block diagram representation of typical Op-Amp interpreting a typical set of data sheets - The ideal Op-Amp equivalent circuit of an Op-Amp – Ideal voltage transfer curve.

UNIT II:

Input off set voltage – Input bias current – Input offset current – Total output offset voltage – Input and output resistance – Thermal drift – CMRR - Voltage shunt and voltage series feedback amplifiers.

UNIT III:

Frequency response of initially compensated Op-Amp – Open loop frequency response - Closed loop Frequency response – Circuit stability - Slew rate. Filters: Low pass filters - High pass filters – Band pass filters - Band reject filters - All pass filters.

UNIT IV:

Adder – Subtractor – Integrator – Differentiator - V to I and I to V converter. Oscillator: Principles - types – Frequency stability phase shift oscillator - Wein bridge oscillator - Square wave generator – Triangular wave generator.

UNIT V:

Comparator - Schmitt trigger - Clipper and clamper - Peak detector - Zero crossing detectors IC 555 function block diagram – Mono stable operation – Astable operation – Applications – Saw tooth wave generator.

Books for Study and Reference:

1. Linear Integrated circuits, D. Roy Choudry & Shail Jain, New Age publications, India, 1999.
2. Operational amplifiers and linear integrated circuits, F. Coughlin & Drison, 4th edition, Prentice Hall of India, India, 1992.
3. Operational Amplifiers and linear integrated circuits, Denton J. Dailey, 1st edition, McGraw-Hill, India, 1989.
4. Operational Amplifiers and linear integrated circuits, Ramakant A. Gayakwad, 3rd edition, Prentice Hall of India, India, 1997.
5. Operational amplifiers and linear ICs, David A. Bell, 2nd edition, Oxford University Press, USA, 2007.

IV SEMESTER**T17 Major Elective****COMPUTER NETWORKS****UNIT I:**

Data communication Concepts: Transmission media - Data encoding - Interface and modems – Multiplexing - Error detection and correction - Digital subscriber line - Circuit switching - Packet switching - Message switching.

UNIT II:

Wide area networks: ISO-ISO layered architecture – Function of the layers - Data link protocols - HDLC, LAPB, LAPD, and Inter networking devices - Repeaters, Bridges, Routers, Routing algorithms - Distance vector routing, link state routing , x.25 protocol, Congestion control.

UNIT III:

Frame relay and ATM networks: Frame relay operation - Layer and traffic control: ATM networks - Architecture switching, Layers services classes.

UNIT IV:

Local Area Networks: LAN Topology - Ethernet-Token Bus-Token ring – FDDI - Wireless LAN, ATM LAN-IEEE 802 Medium access control layer standard - Random access protocols - ALOHA-slotted ALOHA.

UNIT V:

OSI Layers: Transport layer issue - Session layer – Synchronization - Presentation layer - Encryption, Decryption, Application layer - Message handling system, File transfer, Virtual terminal - E-mail.

Books for Study and Reference:

1. Data and computer communication, William Stallings, 6th edition, Pearson education Asia, India, 2002.
2. Data communication and networking, Behrouz A. Forouzan, 2nd edition, Tata McGraw-Hill, India, 2000.
3. Data communication, computer networks and open system, Fred Halsall, 4th edition, Addison Wesley, India, 1995.
4. Computer networks, Andrew S. Tanenbaum, 3rd edition, Prentice Hall of India, India, 1996.

IV SEMESTER**MP4 Core Practical IV****LINEAR INTEGRATED CIRCUIT**

(Any 12 experiments)

1. Characteristics of OP-AMP.
2. Inverting and non-inverting amplifier.
3. Phase shift oscillator using OP-AMP IC.
4. High pass, Low pass, Band pass filters.
5. Integrator and Differentiator.
6. Instrumentation amplifier.
7. Digital to Analog Converter, Analog to Digital Converter.
8. Astable Multivibrator using IC555.
9. Monostable Multivibrator using IC555.
10. Phase locked loop.
11. Characteristics of Schmitt Trigger.
12. Design the circuit for comparator by using OP-AMP IC.
13. Design the circuit for triangular wave generator by using OP-AMP IC.
14. Construct Wien Bridge Oscillator by using OP-AMP IC.

IV SEMESTER

Allied Electronics subjects for other major students

DIGITAL ELECTRONICS

UNIT I:

Number systems and codes – Decimal, binary, octal and hexa decimal number system – conversion from one system to another – Binary arithmetic – 1's and 2's compliments - BCD – excess 3 – gray – Alpha numeric codes.

UNIT II:

Bollean operations – Logic expressions – Rules and laws of Bollean – Demorgan's therorems – Bollean junctions and standard canonical forms – Simplification of expression using Bollean junction algebra and Karnaugh map.

UNIT III:

Arithmetic circuits – Half adder – Full adder – Half subtractor – Full subtractor – Binary adders – BCD adders – Decoders – Encoders – Multiplexers – and their uses in combinational logic circuits.

UNIT IV:

Various flip-flop - RS – JK-D-T Master slave flip-flop – Shift registers serial in serial out – serial in parallel out – Parallel in serial out – Shift right left and bi-directional shift registers - Counters – Asynchronous – Synchronous - Synchronous – Up & down counters – Mod-n counters – Ring counters.

UNIT V:

Memory concepts – Types of semiconductor memories – Static and dynamic RAM – ROM – PROM - EPROM and EEPROM – Read write operation – Memory organization CCD devices.

Books for Study and Reference:

1. Digital Principles & Applications, Malvino & Leach, 5th edition, Tata McGraw-Hill, India, 1994.
2. Digital Electronics - An introduction to Theory and Practice, William H. Gothmann, 2nd edition, Prentice Hall of India, India, 1982.
3. Digital fundamental, Thomas L. Floyd, 10th edition, Prentice Hall of India, India, 2008.
4. Digital practice using integrated circuits, R.P. Jain & Anand, Tata McGraw-Hill, 1983.

IV SEMESTER

Allied Practical for other major Students

BASIC ELECTRONIC DEVICES AND DIGITAL CIRCUITS

PART – A

1. Characteristics of PN diode.
2. Characteristics of Zener diode.
3. Transistor Characteristics – Common base.
4. Transistor Characteristics – Common emitter.
5. Transistor Characteristics – Common collector.
6. Measurement of stability factor of self biasing method.
7. Measurement of stability factor of fixed biasing method.
8. FET Characteristics.
9. Photoconductivity of LDR.
10. Characteristics of Photo diode.
11. Characteristics of SCR.
12. Characteristics of Photo transformer.

PART – B

1. Study of AND, OR, NOT, NAND, NOR and XOR gates using IC.
2. Designing of all the logic gates using NAND gate IC.
3. Designing of all the logic gates using NOR gate IC.
4. Verification of Demorgan's theorems.
5. Construction of gates using discrete components.
6. Code conversion.
7. Half adder and Full adder.
8. Half subtractor and Full subtractor.
9. Multiplexer and De-Multiplexer.
10. Encoder and Decoder.
11. Study of Flip flops.
12. Shift register.
13. Ripple counter.

IV SEMESTER

T25 Skill Based

ELECTRICAL MACHINES

UNIT I:

D.C Motors, Motor Principle - Comparison of motor and generator action - Voltage equation of motor performance characteristics of shunt, series and compound wound motors comparison of series and shunt motors losses and efficiency power flow diagram – starting – 3 point and 4 point starters- Calculation of resistors elements for shunt motor – Electric braking – Electric speed control.

UNIT II:

DC Generator - Working principle - Parts of DC Generator - Types of armature windings- EMF equation of generator - Characteristics of dc generator – Classification of DC - Generator – Self excitation - Armature reaction – Remedies - Commutation – Methods of removing commutation – Losses in DC generators - Efficiency of DC generator – Rating of a generator.

UNIT III:

Transformers - Working principle of transformers - Transformer constructors - Core type transformer - Shell type transformer – Voltage transformation ratio – Losses – Efficiency – Rating - Construction and use of autotransformer - Parallel operation of transformer.

UNIT IV:

Alternator – Working principle - Parts-types relation between speed – Poles - Frequency coil span and distribution factor – Equation of Alternator – Rating losses – Synchronization – Parallel operation of alternators.

UNIT V:

Single phase motors – Induction motor – Shaded pole – Split phase – Capacitor motor – Capacitor start – Capacitor start capacitor run – Universal motor or AC series motor – Repulsion motor – Synchronous motors – Double squirrel cage induction motor – Starting of induction motor – Star delta starter – Determining phase sequence – Speed control – Magnetic locking-Losses.

Books for Study and Reference:

1. Electrical Technology, B.L. Theraja, A.K. Theraja, S. Chand & Co., India, 2008.
2. Basic electrical Engg., P.S. Dhogal, Tata McGraw-Hill, India, 1985.

IV SEMESTER

Non Major Elective subjects for other major students

Choose any one of the following papers (a) or (b)

(a) TELEVISION

UNIT I:

Monochrome Television, Transmitter and receiver (block diagram) picture and sound transmission and reception – Vertical and horizontal scanning – Video signals.

UNIT II:

Transmission channel band width and picture tube video signal dimension – Horizontal and vertical synchronization - Amplitude modulation, Channel band width – Vestigial side band transmission and reception – Transmission efficiency – Frequency modulation, Channel band width for Monochrome and Colour transmission.

UNIT III:

Television transmitter – Block diagram – Positive and negative modulation. Sound transmission – Merits of frequency modulation.

UNIT IV:

Simple circuits for generation of frequency modulation (reactance modulator, varactor diodes modulator)

UNIT V:

Television receiver – Block diagram – Various stages and controls in TV receiver (RF section - IF section – Video detector and amplifier – Sound Section – Automatic gain control deflection circuits – Low voltage and high voltage supplies – simple circuits).

Books for Study and Reference:

1. Monochrome and colour television, R.R. Gulati, Wiley Eastern Ltd., New Delhi, 1994.
2. Antenna and Propagation, K.D. Prasad, 3rd edition, Satya Prakashan, 1996.
3. Modern Television, R.R. Gulati, Wiley Eastern Ltd., India.
4. Colour Television, R.R. Gulati, Wiley Eastern Ltd., India.
5. Basic television and video system, Grob, 2nd edition, Tata McGraw-Hill, India, 1954.
6. Colour television theory and practice, S.P. Bali, 1st edition, Tata McGraw-Hill, India, 1994.

(b) RADAR

UNIT I:

An introduction to radar: Basic radar, The simple form of the radar equation Block schematic of pulse radar – Radar frequencies – Applications of radar, the origins of radar.

UNIT II:

CW radar – Application of CW radar – CW radar with nonzero IF – FM CW radar – FM CW altimeter – MTI and Pulse Doppler radar.

UNIT III:

Introduction to Doppler and MTI radar, Delay line cancellers, Digital MTI Processing, Moving target detector, Pulse Doppler radar.

UNIT IV:

Direction finders – Instrument landing System – Radio ranges. Navigation – Hyperbolic navigation – LORAN. Satellite navigation – Doppler navigation.

UNIT V:

Global positioning system – Different types of microwave antennas – Basic principles. Microwave passive devices, Coaxial connectors and adapters, Phase shifters, Attenuators, Waveguide Tees, Magic tees

Books for Study and Reference:

1. Microwave Devices and Circuits, Liao, 3rd edition, Pearson Education, India, 2003.
2. Introduction to Radar Systems, Merrill I. Skolnik, 3rd edition, Tata McGraw-Hill, India, 2001.
3. Microwave Engineering, Annapurna Das & Sisir K. Das, Tata McGraw-Hill Publication, India, 2001.
4. Microwave Engineering, David M. Pozar, 2nd edition, John Willey, India, 2004.
5. Microwave devices & Circuits, Samuel Liay, Prentice Hall of India, India.
6. Microwave and Radar, A.K. Maini, 3rd edition, Khanna publishers, India.
7. Microwave and Radar Engineering, M. Kulkarni, 3rd edition, Umesh Publications, India, 2003.
8. Introduction to radar systems, Merrill I. Skolnik, 3rd edition, Tata McGraw-Hill, India, 2001.
9. Radar systems and radio aids to navigation, A.K. Sen & A.B. Bhattacharya, Khanna Publishers, India, 2010.

V SEMESTER**T21 Core Theory****MICROPROCESSOR****UNIT I:**

Architecture of 8085 – Instruction set – Data transfer, Arithmetic, Logical, Branching and I/O, Instruction types – Various Addressing Modes, Different 8 bit and 16 bit processors Z80, MC 6800 & INTEL 8086.

UNIT II:

Timing sequence – Instruction cycle – Machine cycle – Halt wait state – Timing diagram for opcode fetch, Memory read & write cycle - Timing analysis. ALP – Mnemonics - Simple assembly language program flow chart stack and subroutines – Interrupts.

Unit III:

Peripheral device – Programmable peripheral Interface (8255 A) – Programmable Interrupt controller (8259 A) – USART – Serial communications Interface. Programmable DMA controller (8257).

Unit IV:

Interfacing – Analog to Digital converter – Digital to Analog converter – Traffic light controller – Stepper motor – Key board & display interface.

Unit V:

Supporting devices – Co-processors – Bus interfacing controller, Bus arbiter, Bus standards – RS232 Bus standards - GPIB – Multibus.

Books for Study and Reference:

1. Microprocessor and Interfacing, Programming and Hardware, Douglas V. Hall, 2nd edition, McGraw-Hill, New York, 1988.
2. Microprocessor Architecture Programming and applications with 8085/8080A. S. Ramesh Goankar, 3rd edition, Wiley Eastern Limited, India, 1986.
3. Digital systems & Microprocessor Douglas V. Hall, 2nd edition, McGraw-Hill, New York, 1983.
4. Microprocessor, Srinath, Prentice Hall of India Learning, India, 2005.

V SEMESTER**T22 Core Theory****MEDICAL ELECTRONICS****UNIT 1:**

Transducer and its principles – Active transducers – Passive transducers – Transducers in bio medical applications – Resting and action potentials – Propagation of action potentials – Bio electric potentials – Electrode theory bio chemical transducers.

UNIT II:

The heart and cardio vascular system - The heart - Blood pressure – Characteristics of blood flow – Electro cardiography – Measurement of blood pressure, Blood flow and cardiac output – Plethysmography - Measurement of Hearts sounds.

UNIT III:

Patient care and monitoring - The elements of intensive care monitoring – Diagnosis calibration and reparability of patient monitoring equipment – Pace makers – Defibrillators.

UNIT IV:

Psycho physiological measurements – Testing motor responses – Sensory measurements – Bio feedback instrumentation – Bio telemetry introduction physiological parameters – N bio telemetry components – Application of telemetry.

UNIT V:

X-Ray machine – Computer tomography (CT scanner) - Magnetic resonance imaging system – Ultra sonic imaging system. Colour Doppler.

Books for Study and Reference:

1. Bio medical instrumentation and measurements, Leslie Cromwell, Fred J. Weibell & Erich Apfeitter, 2nd edition, Prentice Hall of India, India, 1996.
(Unit I to IV chapter: 2, 3, 4, 5, 6, 7, 11, 12)
2. Hand book of Bio medical instrumentation, R.S. Khandpur, Tata McGraw Hill, India, 1997. (Unit V: Chapter 19, 20, 21)

V SEMESTER**T23 Core Theory****MATHEMATICS FOR ELECTRONICS****UNIT 1:**

Finite differences – Difference table operator E, Δ , D - Relations between these operators – Difference equations – Linear difference equation Homogeneous linear difference equation with constant coefficients.

Unit II:

Interpolation using finite differences – Newton Gregory formula for forward interpolation Divided differences – Properties – Newton's formula for unequal intervals – Lagrange's formula – Relation between ordinary differences and divided differences.

Unit III:

Solutions of algebraic and Transcendental equation iterative method, Bisection method, Newton Raphson method. Solution of simultaneous Linear equations – Gauss method - Gauss Jordan method – Iteration method – Gauss Seidel method.

Unit IV:

Theory of equation – Relation between the roots and coefficients - Transformation of equation.

Unit V:

Reciprocal equation - Approximate solution of equation – Newton's method and Homer's method.

Books for study and reference:

1. Mathematics for Electronics, K.C. Pillai.
2. Numerical analysis, Arumugam & Isaac.
3. Numerical analysis, Gupta & Kapoor.
4. Theory of equation, Arumugam & Isaac.
5. Algebra, Manikavasagam pillai.

V SEMESTER

T24 Major Elective

TELEVISION ENGINEERING

UNIT I: Elements of Television system

Basic block schematic of television transmitter and receiver, Analysis of Television pictures, Scanning, Human factor consideration, Flicker, Interlaced scanning, Number of scanning lines, Horizontal and vertical resolution, Maximum video frequency, Colour resolution and bandwidth, Vertical and horizontal synchronization signal dimensions, Channel bandwidth.

UNIT II: Television Camera and Transmitters

Photoelectric effects, Working principle of image orthicon, Vidicon, Plumbicon, CCD, structure of CCD and its working, Monochrome and colour television camera: Block schematic explanation, TV transmitters: Positive and negative modulation and its comparison, High level and low level modulation and its comparison.

UNIT III: Monochrome and Colour Reception, Monochrome Receiver

Detailed block schematic, Yagi antenna, BALUN transformers, RF tuner, Electronic tuning, IF conversion, VSB reception and correction, Video detector, AGC: Delayed AGC and Keyed AGC, Video amplifier, Cathode and grid modulation, Horizontal and vertical deflection circuits and wave forms, Sound separation. Power supplies: SMPS and block schematic explanation, EHT generation.

UNIT IV: Colour Television

Compatibility consideration, Colour response of human eye, Three colour theory, Additive mixing of colours, Chromaticity diagram, Luminances and chrominance, Colour difference signal and its generation, Polarity of colour difference signal, Basic colour television systems: PAL and NTSC, Block schematic explanation.

UNIT V: Television applications

CCTV and its functional block schematic, cable television: Converters, Cable connections. Satellite television: Dish antenna, LNB, Down converters, Video discs: VCD and DVD, Digital recording, LASER source, High definition television.

Books for Study and Reference:

1. Monochrome and colour television, R.R. Gulati, Wiley Eastern, India, 1990.
2. Colour Television, Theory and Practice, 1st edition, S P Bali, Tata McGraw-Hill, 1994.
3. Television engineering, A.M. Dhake, Tata McGraw-Hill, India, 1983.
4. Basic Television Engineering, Bernad Grob, McGraw-Hill, India.

MP5 Core Practical V

V SEMESTER

MICROPROCESSOR

(Any 12 experiments)

1. Program for 8 Bit Addition and Subtraction.
2. Program for 16 Bit Addition and Subtraction.
3. Program for 8 Bit Multiplication and Division.
4. Program for 16 Bit Multiplication and Division.
5. Program for Square and Square root of a number.
6. Program for Sorting and Searching.
7. Program for BCD to Binary, Binary to BCD and ASCII to Binary.
8. Binary to ASCII Conversion.
9. Program to display Time (Hours and Minutes).
10. Program for 1's complement and 2's complement of 8 bit and 16 bit data.
11. Program for Reverse a string.
12. Program for Fibonacci Series.
13. Program for Factorial number.
14. Program for 1's and 0's in given 8-bit binary number.

VI SEMESTER

T26 Core Theory

COMMUNICATION SYSTEM

UNIT I: Introduction

Communication systems – Modulation - Need for modulation - Bandwidth - Amplitude modulation – Theory - Mathematical representation - Frequency spectrum - USB & LSB power relation – Frequency modulation - Theory – Mathematical representation - Frequency spectrum - Phase modulation - Comparison of AM-FM-PM.

UNIT II: Radio Transmitters

AM transmitters - Block diagram - Solid state modulators - Circuit explanation - FM transmitter - Reactance modulator - Varactor diode modulator - Armstrong modulator.

UNIT III: Radio Receivers

Tuned radio frequency receiver - Super heterodyne receiver - Block schematic - Selectivity-sensitivity - Importance of IF - Image frequency rejection - AM receivers - Schematic explanation - RF amplifiers - Circuit explanation - Mixer circuits - IF amplifiers - Circuit explanation - Simple diode detector - Automatic gain control circuit - Simple and delayed AGC - FM receivers - Block schematic explanation - Amplitude limiting - FM demodulator: Slope detectors - Phase discriminator - Ratio detectors.

UNIT IV: Side Band Communication

Single side band transmission - Suppression of carrier - Balanced modulator - Filtering of unwanted sideband - SSB receivers - Block schematic explanation - Pilot carrier receiver - Suppressed carrier receiver - Vestigial side band transmission - Transmitter and receiver responses - Advantages of VSB in television

UNIT V: Telephone Systems

Telephone subscribers loop circuit - Subscribers line interface circuit - Pulse and tone signaling - Frequency assignments - Electronic telephone block schematic of a telephone set -Block schematic of single line analog SLIC board two wire repeaters – Electronic private automatic branching exchange - Basic block schematic – Power line communication: Block schematic explanation Facsimile - FA transmitter and receiver.

Books for Study and Reference:

1. Electronic communication system, Wayne Tomasi, 5th edition, Pearson Education, India, 2009.
2. Electronic communication, Rody and Cooln, 4th edition, Pearson Education India, India, 2009.
3. Electronic communication System, George Kennedy, 3rd edition, Tata McGraw-Hill, India, 1985.
4. Electronic and Radio Engineering, A.P. Mathur.
5. Telephony and carrier current engineering, N. Das.
6. Modern Communication systems, Leon W. Couch, Prentice Hall of India, India, 1995.

VI SEMESTER

T27 Core Theory

INDUSTRIAL ELECTRONICS

UNIT I: Control Systems

Introduction to automatic control system – Open loop control systems - Examples of open loop control system: Automatic washing machine, Automatic traffic light system – Advantages & disadvantages of open loop control systems. Closed loop control systems - Examples of closed loop control system: Home heating system, Gasoline engine – Components of closed loop control systems – Advantages & disadvantages of closed loop control systems – Basic elements of servo system – System performance.

UNIT II: Contactors, Relays & Electronic Timers

Electromagnetic contactor – Relays - Introduction – DC operated solenoid type relay – Thermal overload relay – Time Delay Relay (TDR) - Types: Pneumatic time delay relay - Motorized time delay relay - Electronic timer - Integrated Circuit timer - Programmable timer.

UNIT III: Inverters, Choppers, & Cycloconverters

Inverters: Introduction – Working principle of Inverters – Thyristor inverters – Simple series inverter – Parallel inverters – Basic single phase Bridge inverter. Choppers: Introduction – Types: DC chopper – Single Thyristor chopper – Two-Thyristor chopper. Cycloconverters: Introduction – Single phase Cycloconverter - Types: Single phase centre tapped transformer Cycloconverter – Bridge configuration single phase Cycloconverter – Three pulse three phase Cycloconverter.

UNIT IV: Ultrasonics

Introduction – Generation of Ultrasonics – Piezoelectric ultrasonic generator – Magnetostriction ultrasonic generator using Colpitt's oscillator – Applications on Ultrasonics.

UNIT V: Circuit breakers, Starter & Heating

Introduction – Static AC circuit breakers - Static DC circuit breakers – Soft starter – High frequency heating – Induction heating – Dielectric heating

Books for Study and Reference:

1. **UNIT I to IV** → Industrial Electronics and Control, S.K. Bhattacharya & S. Chatterjee, Tata McGraw-Hill, India, 1995.
2. **UNIT V** → Industrial Electronics, J. Gnanavadivel, R. Dhanasekaran & P. Maruthupandi, 1st edition, Anuradha publications, India, 2011.
3. Industrial Electronics and Control, Biswanth Paul, 2nd edition, Prentice Hall of India, India, 2009.
4. Industrial Electronics, Thomas E. Kissell, 3rd edition, Prentice Hall of India, India, 2002.

VI SEMESTER

T28 Core Theory

VLSI DESIGN

UNIT I: Process Steps in IC Fabrication

Crystal growth and wafer preparation – Czochralski process – Silicon shaping - Slicing - polishing – Diffusion of impurities – Fick's I and II law of diffusion – Diffusion profiles – Ion implantation – Annealing process – Oxidation process – Lithography – Photolithography, Fine line lithography, electron beam and x-ray lithography – Chemical vapour deposition (CVD) – Epitaxial growth – Metallisation – Patterning – Wire bonding and packaging.

UNIT II: MOS Technology

Introduction - MOS transistor fabrication - FET structures – JFET – MOSFET – PMOS and NMOS, Control of threshold voltage (V_{th}) – Schottky diode - Sheet resistance and resistor design – Capacitor design – Metal gate & silicon gate technology – Oxide isolation.

UNIT III: CMOS Technology

Introduction - Fabrication steps - Latch up – Bi-CMOS technology: Fabrication steps – Circuit design process: Stick diagrams – Design rules – Basic circuit concepts: Capacitance of layers – Driving large capacitance loads – Wiring capacitance – Scaling of MOS structures – Scaling factors.

UNIT IV: Subsystem Design and Layout

Simple logic circuits – Inverter, NAND gates, NOR gates, CMOS logic systems – Combinational logic: Multiplexer - Bus lines & arrangements – Power dissipation – Power supply rail distribution – Subsystem design process: Design of a 4 bit shifter.

UNIT V: Gallium Arsenide Technology

Sub-micron CMOS technology – Crystal structure – Doping process – Energy Band Structures – MOSFET – GaAs fabrication – Device modeling.

Books for Study and Reference:

1. Modern VLSI design, Wayne Wolf, 4th edition, Pearson Education, USA, 2008.
2. VLSI technology, S. M. Sze, 2nd edition, McGraw-Hill, India, 1988.
3. Basic VLSI design, Douglas Pucknell, 3rd edition, Prentice Hall of India, India, 2005.
4. Principles of CMOS VLSI Design, H.E. Weste, 3rd edition, Pearson Education, India, 2006.
5. Integrated Circuits, K.R. Botkar, 5th edition, Khanna Publications, India, 2010.
6. CMOS circuit design layout and simulation: R. Jacob Baker, 3rd edition, IEEE press, 2010.
7. Introduction to VLSI, Conway, Addison Wesley, USA, 1979.

VI SEMESTER

T29 Core Theory

ROBOTICS

UNIT 1: Introduction

Robotics and programmable automation, Historical background, Laws of robotics, Robot definition, Robot anatomy and systems, Human systems and robotics, Specification of robotics.

UNIT 2: Robot Kinematics

Introduction, Forward and reverse kinematics of three degree of freedom robot arm, Forward and reverse transformation of a four degrees of freedom manipulator in 3-D, Homogeneous transformations kinematic equation using homogeneous transformations.

UNIT 3: Robot Drives, Actuators and Control

Function of drive systems, General types of fluids, Pump classification, Pneumatic system, Electrical drives, DC: Motors, Stepper motor and drives mechanisms.

UNIT 4: Robot End-Effectors

Classification of end-effectors, Drive system for grippers, Mechanical, Magnetic, Vacuum and adhesive grippers, Hooks, Scoops and others devices, Active and passive Grippers.

UNIT 5: Sensors and Intelligent Robots

Artificial intelligence and automated manufacturing, AI and robotics, Need for sensing systems, Sensory devices, Types of sensors, Robot vision systems - Robot Languages and programming Different languages, Classification of robot languages, Computer control and robot software, VAL systems and languages.

TEXT BOOKS:

1. Robotics technology and flexible automation, S.R. Deb, 2nd edition, Tata McGraw-Hill, India, 2010.
2. Robotics principles and practice, Dr. K.C. Jain & Dr. L.N. Agarwal, Khanna Publishers, India, 1993.
3. Introduction to robotics, mechanics and control, John J. Craig, Addison Wesley, USA, 1986.

VI SEMESTER

T30 Major Elective

FIBRE OPTIC COMMUNICATION

UNIT I: Introduction to Optical Fibres

Evolution of fibre optic system - Element of an Optical fibre transmission link - Ray optics- Optical fibre modes and configurations - Mode theory of circular wave guides – Overview of modes - Key model concepts - Linearly polarized modes - Single mode fibres - Graded index fibre structure.

UNIT II: Signal Degradation Optical Fibres

Attenuation - Absorption losses, Scattering losses, Bending losses, Core and cladding losses, Signal distortion in optical wave guides - Information capacity determination - Pulse broadening in GI fibres - Mode coupling – Design optimization of SM fibres - RI profile and cut – Off wavelength.

UNIT III: Fibre Optical Sources and Coupling

Direct and indirect band gap materials – LED structures – Light source materials - Quantum efficiency and LED power, Modulation of a LED, Lasers Diodes - Modes and threshold condition- Laser diodes, Temperature effects, Introduction to quantum laser, Fibre amplifiers – Power launching and coupling. Lencing schemes, Fibre- to –fibre joints.

UNIT IV: Fibre Optical Receivers

PIN and APD diodes – Photo detector noise, SNR, Detector response time, Avalanche multiplication, Noise - Comparison of photo detectors – Fundamental receiver operation - Preamplifiers. Error sources - Receiver configuration – Probability of error – Quantum limit.

UNIT V: Digital Transmission System

Point-to-Point links system considerations - Link power budget - Rise-time budget - Noise effects on system performance – Operational principles of WDM, Basic on concepts of SONET/SDH Network.

Books for Study and Reference:

1. Optical Fibre Communication, Gerd Keiser, 3rd edition, McGraw–Hill International, Singapore, 2000.
2. Optical Communication, Principles and Practice, J. Senior, 2nd edition, Prentice Hall of India, India, 1994.
3. Optical Communication System, J. Gower, Prentice Hall of India, India, 2001.

VI SEMESTER

MP6 Core Practical VI

ELECTRONIC SYSTEM DESIGN LAB

(Any 12 experiments)

1. Design and construction of fixed voltage power supply.
2. Design and construction switching power supply.
3. Design and construction of 1.5V to 12V power supply.
4. Design and construction of Burglar alarm using LDR.
5. Design and construction of temperature switch using Thermistor.
6. Design and construction of light sensitive switch using photo diode.
7. Design and construction of audio amplifier using LM 380.
8. Design and construction of timer circuit.
9. Design and construction of Decade counter/Seven segment decoder.
10. Design and construction of logic probe.
11. Design and construction of photo transistor circuit.
12. Design and construction of the circuit of Thermistor.
13. Design and construction of the circuit of transistor switch.
14. Design and construction of voltage doubler circuit.

APPENDIX - AZ60

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
B.Sc ELECTRONICS & COMMUNICATION (CBCS)
Scheme of examinations (2012– 2013 onwards)

SEMESTER I

	Components	Hours	Credits
Part I	T1- Tamil	6	3
Part II	T2- English	6	3
Part III	Core:		
	T3- Theory I: Basic Electronic Devices and Digital Circuits	6	4
	MP1- Practical: Basic Electronic Devices	4	4
Part III	Allied-I		
	TP4- Theory Paper I:	4	2
	AP1- Practical I:	2	2
Part IV	TP5 - Environmental Studies	2	2
	Total (Total Papers: 05 Theory)	30	20

SEMESTER II

	Components	Hours	Credits
Part I	T6 - Tamil	6	3
Part II	T7- English	6	3
Part III	Core:		
	T8- Theory II: Semiconductor Devices	6	4
	MP2- Practical: Digital Circuits	4	4
Part III	Allied-I		
	T9- Theory Paper II:	4	4
	AP1- Practical I:	2	2
Part IV	T10- Value Based Education – Social Value Education	2	2
	Total (Total Papers: 07- 5 Theory + 2 Practical)	30	22

SEMESTER III

	Components	Hours	Credits
Part III	T11- Core: Theory III : Electronic Circuits	6	4
Part III	T12- Core: Theory IV: Electronic Measurement & Circuit Theory	6	4
Part III	MP3- Core: Practical: Electronic Circuits & Measurements	6	4
	Allied II:		
	T13- Theory Paper III: Digital Data Communication	4	4
Part III	AP2- Practical II:	2	
Part IV	T14- Skill based subject (I): Telecommunication	4	4
	T15- Non-Major Elective (I): Electronic Trouble Shooting (or) Computer Hardware	2	2
	Total (Total Papers:05 Theory)	30	22

SEMESTER IV

	Components	Hours	Credits
Part-III	T16- Core: Theory V: Linear Integrated Circuits	6	4
Part-III	T17- Major Elective: Microprocessor & Interfacing	6	5
Part-III	MP4- Practical : Linear Integrated Circuit	6	4
Part-III	Allied II: T18 - Theory Paper: IV: Advanced Communication systems AP2- Practical II: Communication Laboratory	4 2	4 2
Part-IV	T19 - Skill Based Subject II: Electrical Instruments and Measurements	4	4
	T20 - Non Major Elective II: Industrial Controls (or) Power Convertors	2	2
Part-V	Extension activity	-	1
	Total (Total Papers:07- 5 Theory + 2Practical)	30	26

SEMESTER V

	Components	Hours	Credits
Part-III	T21- Core : Theory VIII: Communication system	4	4
Part-III	T22- Core : Theory IX: Mathematics for Electronics	4	4
Part-III	T23- Core : Theory X: Digital Communication	4	4
Part-III	T24- Major Elective I: Theory XI : VLSI Design	6	5
Part-III	MP5- Practical: Communication system	8	4
Part-IV	T25- Skill Based III (Common): Personality Development (or) Effective Communication	4	4
	Total (Total Papers:05 Theory)	30	25

SEMESTER VI

	Components	Hours	Credits
Part-III	T26- Core: Theory XII: Optical Fibre Communication	4	4
Part-III	T27- Core: Theory XIII: Advanced Communication System	4	4
Part-III	T28- Core: Theory XIV: Computer Networks	4	4
Part-III	T29- Core: Theory XV: Antennas	4	4
Part-III	MP6- Practical: Electronic System Design	8	4
Part-III	T30- Major Elective II: Power Electronics	6	5
	Total (Total Papers:07- 5 Theory + 2Practical)	30	25

Total number of courses : 38 (30 Theory + 8 Practical)

Total number of hours : 180

Total number of credits : 140

Note: Distribution of marks in Theory between External and Internal Assessment is 75:25

For practicals – 60:40

Pass mark: Minimum of external and overall components.

Appropriate Major / Allied related, 'Allied Courses' and 'Skill based courses' may be chosen by the Major departments, taking into account the total work load of the department.

Abbreviations: T – Theory, MP – Major Practical, AP – Allied Practical.

III SEMESTER

T11 Core Theory

ELECTRONIC CIRCUITS

UNIT I:

Rectifiers – Half wave rectifier, Full wave rectifier, Bridge rectifier, Inductor – Capacitor – L-type filters – Ripple factor - Voltage regulator (series type) – Current limit over load production – Introduction to IC fixed and variable IC723, 78XX, 79XX – Voltage regulators - Formula value substitution problems.

UNIT II:

Amplifiers – General principle of operation – Classification of amplifiers – Classification of distortion (amplitudes, frequency, phase) – RC coupled amplifier – Gain – Frequency response – Input and output impedance – Multistage amplifiers – Transformer couple amplifiers – Frequency response – Formula value substitution problems.

UNIT III:

Introduction – Classification power amplifier – Class A power amplifier – Class A push pull amplifier – Class B power amplifier – Class B push pull amplifier – Class C power amplifier – Class C push pull amplifier – Power dissipation output power – Distortion – Formula value substitution problems.

UNIT IV:

Feedback – Basic concepts – Characteristics – Effect of negative feedback – On gain – Stability – Distortion – Bandwidth – Voltage to current feedback amplifier circuits - Formula value substitution problems.

UNIT V:

Classification of oscillators – Use of positive feedback – Barkhausen criterion for oscillation – Colpitts oscillator – Hartley oscillator – Wein bridge oscillator – Phase shift oscillator – Crystal oscillator – Frequency stability of oscillators – Multivibrators (mono, astable, bistable) - Formula value substitution problems.

Books for Study and Reference:

1. Electronic devices and circuits – Millman & Halkias, 2nd edition, Tata McGraw-Hill, India, 2008.
2. Electronic devices and applications and integrated circuits, Mathu.

3. Basic Electronics, B.L. Theraja, 5th edition, S. Chand & Co. Ltd., India, 2007.
4. Electronic devices and circuits, G.K. Mithal, Khanna publishers, India, 2008.
5. Electronic devices and circuits, Allen Mottershead, 1st edition, Prentice Hall of India Learning, India, 2011.
6. Problems and solutions of electronic devices and circuits, Experience teachers CBS publication, New Delhi.

III SEMESTER

T12 Core Theory

ELECTRONIC MEASUREMENT AND CIRCUIT THEORY

UNIT I:

Measurements, Errors in measurements – Standard, Classification and characteristics of Transducers, AC/DC Bridge measurements and their applications.

UNIT II:

A.F Spectrum analyzer – Digital Voltmeter and Multimeters, AC Voltmeter – Vector voltmeter – CRO – Block diagram – Single beam – Dual trace – Sampling Oscilloscope - Analog – Digital Recorders and printers.

UNIT III:

Ohms law – Kirchhoff's law and their application – Branch and loop currents – Mesh and node analysis.

UNIT IV:

Fundamental ideas of AC circuits – Impedance of RL, RC, RLC circuits – Resonance in AC circuits – Series and parallel single tuned and double tuned completed circuits.

UNIT V:

Network graph of a network – Concept of tree – Branches and chords dual network – Network theorems: Superposition, Thevenin, Norton, Maximum power transfer theorem.

Books for Study and Reference:

1. Instrumentation devices and systems, C.S. Rangan, 5th edition, Tata McGraw-Hill, India, 1998.
2. Electronic instrumentation and measurement techniques, Copper, Prentice Hall of India, India, 1989.
3. Digital instrumentation, A.J. Bouwels, McGraw-Hill, India, 1986.
4. Intelligent Instrumentation, C. Barney, Prentice Hall of India, India, 1985.
5. Electronic Measurements and Instrumentation, Oliver & Cage, McGraw-Hill, India, 1975.
6. Measurements Systems, Deobelin, 4th edition, McGraw-Hill, India, 1990.
7. Electronic circuits, Edminister, 5th edition, Tata McGraw-Hill, India, 2011.

8. Circuits and Networks, Analysis and Synthesis, A. Sudakar & S.P. Shyammohan, Tata McGraw-Hill, India.
9. Networks, Analysis and Synthesis, Umesh Sinha, 7th edition, Sathya Prakashan, India, 2010.
10. Electronic circuits Theory, Dr. M. Arumugam & Dr. N. Prem Kumaran, 5th edition, Khanna Publishers, India, 2011.

III SEMESTER

T 14 Skill Based

TELECOMMUNICATION

UNIT I:

Evolution of telecommunication: Basic Switching System, Simple Telephone communication, Telephone Transmitter, Telephone receiver, telephone's bell & dialer pulsing mechanism, Subscribers telephone sets, Dialing types, Signaling tones, Brief introduction to electromagnetic exchanges.

UNIT II:

Electronic Switching – Space division switching stored programme control – Centralized SPC, Distributed SPC, Software Architecture, Application Software – Enhanced services, Multi stage switching networks.

UNIT III:

Time Division Switching – Time Division Space Switching, Time Division time Switching, Time Multiplexed space switching, Time multiplexed time switching, Combination switching.

UNIT IV:

Traffic Engineering, Grade of Service and Blocking Probability – Telephone Networks, Subscriber loops, Switching Hierarchy and Routing, Signaling Techniques, In Channel, Conman Channel, Transmission media.

UNIT V:

Fax System - Basic facsimile system-Facsimile application - Working of fax machines - Recording media - Fax reproduction technique. Mobile radio communication - Introduction - Cellular structures and planning - Frequency allocation - Propagation Problems - Base station antenna- Mobile unit antenna- Types of mobile systems – Handoffs - Analog cellular radio - Digital cellular radio - Digital narrowband TDMA and CDMA technology.

Books for Study and Reference:

1. Digital Telemetry, John C. Bellamy, 3rd edition, Wiley-Interscience, New York, 2000.
2. Telecommunication Switching Systems and Networks, Thiagarajan, Prentice Hall of India, India, 2004.
3. Telecommunication system Engg., Roger L. Freeman, 4th edition, Wiley-Interscience, New York, 2004.
4. Wireless mobile communication, Rappaport, Pearson education India, India, 2009.

III SEMESTER

MP3 Core Practical III

ELECTRONIC CIRCUITS AND MEASUREMENTS

(Any 12 experiments and six from each section)

Section – I: ELECTRONICS CIRCUITS

1. Study and use of CRO.
2. Half wave rectifier & Full wave rectifier.
3. Fixed dual power supply construction using ICs.
4. RC coupled amplifier two stages.
5. FET amplifier.
6. RC phase shift oscillator.
7. Hartley oscillator.
8. Colpitts oscillator.
9. Clipping and clamping circuits.
10. Monostable multivibrator.
11. Astable Multivibrator.

Section – II: MEASUREMENT LAB

1. Wheatstone bridge.
2. Kelvin double bridge.
3. Maxwell bridge.
4. Hay bridge.
5. Schering bridge.
6. LVDT.
7. Displacement meter.
8. Transducer applications and measurements.
9. Extension of range of PMMC meter.
10. Current measurement using sensors.

Allied Subject for other major Students

III SEMESTER

DIGITAL DATA COMMUNICATION

UNIT I:

Ray form coding techniques, Information in a communication system - Low pass, band pass, PCM, Quantizing and encoding - Companding – DM – ADM - Comparison of PCM and DM on the basics of speech signals – Telegraphy - Telex - FDM and TDM - coding speech at low bit rays - Typical telephone multiplexing scheme with details of bit, Word and frame-Synchronization.

UNIT II:

Modulation techniques and codes - Band pass data transmission systems - PSK – FSK-DPSK-QPSK - MSK- Receiver implementation - Signal detection techniques – Definition of codes - need for line shaping signals – RZ - NRZ - Shannon’s noiseless coding theorem- Shannon coding – Huffman’s coding.

UNIT III:

Discrete signals-information rate - Shannon’s theorem - Channel capacity - Symmetric channels - Deterministic and noiseless channels - Entropy of continuous signals - Rate of transmission – Capacity of band limited channels - Shannon Hartely law - Band width - SNR trade off - Bandwidth efficiency - Shannon’s limit.

UNIT IV:

Half duplex – Full duplex - Synchronous and asynchronous communication - Telephone system - Multiplexer circuit, message and packet switching - Concept of protocols - ISO-OSI reference model - Functions of each layers - RS 232C, RS422A, V.24 - SDLC, HDLC procedures.

UNIT V: LAN and Internet Working

TCP/IP – APQ and protocols used in each layer - LAN topology and standards – IEEE 802.3(CSMA/CD).IEEE 802.4(token bus), Token ring, Purse ALOHA protocols, Conventional channel allocation methods, Radio and satellites networks, ISDN, Local Area Network.

Books for Study and Reference:

1. Digital communication, Simon Haykin, 1st edition, Wiley, India, 2006.
2. Communication Systems, Taub & Schilling, 3rd edition, Tata McGraw Hill, India, 2008.
3. Digital Communications, John Proakis, 5th edition, McGraw-Hill, India, 2007.
4. Introduction to Data communications and networking, M. Schwarts.
5. Computer Networks, Andrew S. Tanenbaum, 3rd edition, Pearson Education in South Asia, India, 2007.

III SEMESTER

Non Major Elective subjects for other major students

Choose any one of the following papers (a) or (b)

(a) ELECTRONIC TROUBLESHOOTING

UNIT I:

Corrective maintenance – Troubleshooting – Repairing troubles – Testing or operational check – Troubleshooting aids – Corrective maintenance time – Intermittent troubles – Precautions while trouble shooting and repair.

UNIT II:

Preventive maintenance - Merits and demerits of preventive maintenance – Preventive maintenance program - Maintenance schedule – Maintenance record – Shut down planning – Calibration – Inspection.

UNIT III:

Classification of printed circuit boards – Manufacturing process – Repair of PCB's.

UNIT IV:

Digital test instruments – Basic digital Measurements – Testing digital circuits – Digital equipment services literature – Digital trouble shooting – Use of some test equipments.

UNIT V:

Troubleshooting laboratory and Industrial equipments – Power suppliers, oscillators, function generators - Speed controllers - C.R.O.

Book for Study and Reference:

1. Maintenance of Electronic Equipments, K.S. Jamwal, 1st edition, Dhannpat Rai & Co, India, 2002.

(b) COMPUTER HARDWARE

UNIT I:

CPU essentials – Processor modes – Modern CPU concepts – Architectural performance features – The Intel's CPU.

UNIT II:

Essential memory concepts – Memory organizations – Memory packages – Modules – Logical memory organizations – Memory considerations – Memory types - Memory techniques – Selecting and installing memory.

UNIT III:

Active mother boards – Sockets and slots – Intel D850GB - Pentium4 mother board - Expansion slots – Form factor - Upgrading a mother board - Chipsets – North bridge - South bridge.

UNIT IV:

Power supplies and power management – Concepts of switching regulation – Potential power problems – Power management. The floppy drive – Magnetic storage – Magnetic recording principles – Data and disk organization – Floppy drive – Hard drive – Data organization and hard drive – Sector layout.

UNIT V:

IDE drive standard and features – Hard drive electronics – CDROM drive – Construction – CDROM electronics – DVD-ROM – DVD media – DVD drive and decoder.

Books for Study and Reference:

1. Trouble Shooting, Maintaining and Repairing PCs, Stephen J. Bigelow, 5th edition, Tata McGraw-Hill, New Delhi, 2001.
2. The complete reference: PC hardware, Crig Zacker & John Rourke, 1st edition, Tata McGraw-Hill, New Delhi, 2001.
3. Introduction to PC Hardware and Trouble shooting, Mike Meyers, Tata McGraw-Hill, New Delhi, 2003.
4. IBM PC and Clones hardware trouble shooting and Maintenance, B. Govindarajulu, Tata McGraw-Hill, New Delhi, 2002.

IV SEMESTER

T16 Core Theory

LINEAR INTEGRATED CIRCUITS

UNIT I:

Differential Amplifier - Dual Input - Balance output Differential Amplifier - Current monitor-Level translator - Block Diagram representation of typical Op-Amp interpreting a typical set of data sheets - The ideal Op-Amp - Equivalent circuit of an Op-Amp - Ideal voltage transfer curve.

UNIT II:

Input Offset voltage - Input bias current- input offset current - Total output offset voltage - Input and output resistance – Thermal drift – CMRR – Voltage shunt and Voltage series feedback amplifiers.

UNIT III:

Frequency response of initially compensated Op-Amp - Open loop frequency response - Closed loop frequency response - Circuit stability - slew rate - Filters: Low pass filters – High pass filters - Bandpass filters - Band reject filters - All pass filters.

UNIT IV:

Adder – Subtractor – Integrator - Differentiator – Voltage to current and current to voltage converter - Oscillator: Principles – Types - Frequency stability base shift oscillator – Wein bridge oscillator – Square wave generator - Triangular wave generator.

UNIT V:

Comparator - Schmitt trigger - Clipper and clamper - Peak detector - Zero crossing detectors- IC555 Function Block diagram - Monostable operation – Astable operation – Applications - Saw tooth wave generator.

Books for Study and Reference:

1. Linear Integrated circuits, D. Roy Choudry & Shail Jain, New Age publications, India, 1999.
2. Operational amplifiers and linear integrated circuits, F. Coughlin & Drison, 4th edition, Prentice Hall of India, India, 1992.
3. Operational Amplifiers and linear integrated circuits, Denton J. Dailey, 1st edition, McGraw-Hill, India, 1989.
4. Operational Amplifiers and linear integrated circuits, Ramakant A. Gayakwad, 3rd edition, Prentice Hall of India, India, 1997.
5. Operational amplifiers and linear ICs, David A. Bell, 2nd edition, Oxford University Press, USA, 2007.

IV SEMESTER

T17 Major Elective

MICROPROCESSOR AND INTERFACING

UNIT I:

Architecture of 8085 – Instruction set – Data transfer, Arithmetic, Logical, Branching Instruction, Instruction types – Various Addressing modes – Z80 - MC 6800

UNIT II:

Instruction cycle - Timing diagram for opcode fetch cycle, memory read, Input/output read, memory write – Timing analysis – Simple Assembly language programs – Stack and Subroutines - Mnemonics (opcode and operands).

UNIT III:

Peripheral device - Programmable DMA controller (8257) – Programmable Peripheral interface (8255A) - Programmable interrupt controller (8259A) – Programmable communication interface (8251).

UNIT IV:

Interfacing – Analog to digital converter (ADC 0800) – Digital to analog converter (DAC 0800) – Stepper Motor – Traffic light control – Keyboard and Display interface.

UNIT V:

Supporting devices – Co processors Intel 8087 – Clock generator Intel 8284A - RS232 bus standards – Bus interface controller (8288) - GPIIP.

Books for Study and Reference:

1. Fundamentals of Microprocessors and Microcomputers, Dr. Badri Ram, 4th edition, Dhanpat Rai & sons, India, 1993.
2. Microprocessors & Microcontrollers, A. Nagoor Kani, 1st edition, Rba Publications, India, 2009.

MP4 Core Practical IV

IV SEMESTER

LINEAR INTEGRATED CIRCUIT

(Any 12 experiments)

1. Characteristics of OP-AMP.
2. Inverting and non-inverting amplifier.
3. Phase shift oscillator using OP-AMP IC.
4. High pass, Low pass, Band pass filters.
5. Integrator and Differentiator.
6. Instrumentation amplifier.
7. Digital to Analog Converter, Analog to Digital Converter.
8. Astable Multivibrator using IC555.
9. Monostable Multivibrator using IC555.
10. Phase locked loop.
11. Characteristics of Schmitt Trigger.
12. Design the circuit for comparator by using OP-AMP IC.
13. Design the circuit for triangular wave generator by using OP-AMP IC.
14. Construct Wien Bridge Oscillator by using OP-AMP IC.

IV SEMESTER
Allied Subject for other major Students

ADVANCED COMMUNICATION SYSTEM

UNIT I: Optical Fibre Transmission Media

Optical communication – Advantages of optical fibres – Block diagram of an optical fibre communication system. Optical fibre construction, light propagation – Refraction, Refractive index, Snell's law – Optical fibre configurations – Coupling fibres – Fibre splicing – Optical fibre connections – Coupling losses; Optical sources – LED's, ILD, Light Detectors – PIN diodes.

UNIT II: Telephone Instrument and Signals

Introduction – Carbon Granule transmitter, Receiving transducer, Simple local battery telephone circuit – Functions of Telephone Set, Block diagram of Telephone set, Basic telephone call procedures, Call progress tones and signals – Dial tone, DTMF tone, Dial tone, Dial pulse, Station busy, Equipment busy, Ringing, Ring-back, Receiver on/off Hook, Cordless telephones, Caller ID, Electronic Telephones.

UNIT III: Public Telephone Network and Switching

Instruments, Local Loops, Trunk circuits and Exchanges, Local central office telephone Exchanges, Operator assisted local exchanges, Automated central office switches and exchanges, Matrix Switching, Step by step switching.

UNIT IV: Cellular Telephone Concept

Cellular telephone – Fundamental concepts of cellular telephones – Frequency reuse, Interference – Co-channel, Adjacent channel, Cell splitting, Sectoring, Segmentation and Duplication, Cellular system topology, Roaming, Handoff, Cellular telephone network components – Electronic switching center, Cell-site controller, Radio Transceiver, System interconnects, Mobile and Portable Telephone units, Communication protocols.

UNIT V: Satellite Communications

Kepler's laws, Satellite orbital pattern, Geosynchronous satellites, Satellite classifications, Spacing and Frequency allocation, Satellite antenna radiation patterns, Footprints, Satellite system link models – Uplink, Transponder, Downlink, Cross-links.

Books for Study and Reference:

1. Advanced electronics communication systems, Wayne Tomasi, 6th edition, Prentice Hall of India, India, 1998.
2. Telecommunication Systems, P.H. Smale, 2nd edition, Wheeler Publication, India.
3. Optical Fibre Communications, Gerd Kaiser, 2nd edition, Tata McGraw-Hill, India.
4. Satellite Communications, Roddy, 4th edition, Tata McGraw-Hill, India, 2006.

IV SEMESTER

Allied Practical for other major Students

COMMUNICATION LABORATORY

1. Suppressed carrier AM.
2. Voltage to frequency converter.
3. Study of AGC (Automatic Gain Control).
4. Study of mixer circuit.
5. Study of IF amplifier.
6. Study of analog signal sampling.
7. Directional characteristics of micro phone and loud speakers.
8. Time division MUX and De-MUX.
9. PCM encoder.
10. PCM detector.
11. ASK modulator and detector.
12. PSK modulator and detector.
13. Low high power splitter using MATLAB.
14. Band pass and band stop filter using MATLAB.

V SEMESTER

T25 Skill Based

ELECTRICAL INSTRUMENTS AND MEASUREMENT

UNIT I: Basic Electronic Instruments

Cathode ray oscilloscope - Special oscilloscope - RF voltage and power measurements.

UNIT II: Signal Generators and Analyzers

Function generators - RF signal generators - Sweep generators - Frequency synthesizer - Wave analyzer - Harmonic distortion analyzer - Spectrum analyzer.

UNIT III: Digital Instruments

Comparison of analog and digital techniques - Digital voltmeter - Multimeter frequency counters - Measurement of frequency and time interval - Extension of frequency range - Measurement errors.

UNIT IV: Data Acquisition Systems

Elements of a digital data acquisition system - Interfacing of transducers-multiplexing-computer controlled instrumentation - IEEE 488 bus.

UNIT V: Fibre Optic & Microwave Measurements

Fibre optic measurements for power and system loss - Optical time domains reflectometer. Microwave Measurements Measurement of standing wave ratio, Measurement of frequency, Measurement of power, Phase shift, Antenna pattern measurement.

Books for Study and Reference:

1. Elements of Electronics Instrumentation and Measurement, Albert J. Carr, Pearson education, India, 2003.
2. Principles of Measurements and Instrumentation, Alan S. Morris, 2nd edition, Prentice Hall India, India, 2003.
3. Measurement Systems - Application and Design, Ernest O. Doebelin, 5th edition, Tata McGraw-Hill, India, 2004.
4. Microwave Engineering, A. Dass & S.K. Dass, 2nd edition, Tata McGraw-Hill, India, 2009.

IV SEMESTER

Non Major Elective subjects for other major students

Choose any one of the following papers (a) or (b)

(a) INDUSTRIAL CONTROLS

UNIT I:

Starting and speed control of DC Motors – Starting and speed control of AC motors – Automatic regulation system.

UNIT II:

Elements of automatic control system - Rotary amplifiers – Magnetic amplifiers – Thyristor control of DC and AC motor Inverters – Cyclo convertors.

UNIT III:

Phase control of DC shunt motor – Reversible speed control of DC motor using dual converter – Chopper control of DC series motor – Slip control – Frequency control – constant speed DC drive.

UNIT IV:

Pilot devices and accessories – Push button controllers & master switches – Rotary selector switches – Rotary control switches – Over travel and limit switches – Float switches – Pressure switches and regulators – Thermostats or temperature switches – Speed governors.

UNIT V:

Plugging switches – Contactors - Electromagnetic relays – Protective relays – Voltage relay- Electromagnetic time relay – Control and automation relays – Polarized electromagnetic relay - Construction and operation of electromagnetic relay.

Books for Study and References:

1. Utilization of Electric Power and Electric Traction, G.C. Garg, 9th edition, Khanna Publishers, India, 2012.

(b) POWER CONVERTORS

UNIT I:

DC-AC PWM inverters: Introduction – Principle of operation – Performance parameters - Single phase bridge inverters.

UNIT II:

Three phase inverters – Voltage control of single phase inverters – Voltage control of three phase inverters – Current secure inverters.

UNIT III:

Resonant pulse Inverters: Introduction – Series resonant inverters – Parallel resonant inverters – Zero current Switching resonant converter.

UNIT IV:

Zero voltage switching resonant converter – Two quadrant ZVS resonant converter - Resonant DC link inverter.

UNIT V:

Principle of phase controlled converter operation – Single phase full converter – Single phase dual converter

Book for Study and Reference:

1. Power electronics, Circuits, Devices & Applications, Rashid M.H., 3rd edition, Pearson Education, India, 2003.

V SEMESTER

T21 Core Theory

COMMUNICATION SYSTEM

UNIT I:

Basic elements of a communication system – Modulation – Description – Need for Modulation – Noise – External noise (Atmospheric and Extra terrestrial Noise) – Internal Noise (Thermal Agitation, Shot, Transit-time Noise) – Signal to Noise Ratio – Definition of Noise Figure – Calculation of Noise Figure.

UNIT II:

Amplitude modulation – Theory of AM – Frequency spectrum of the AM wave – Representation of AM – Power relations in the AM wave – Frequency modulation – Theory of Frequency modulation – Mathematical Representation of FM – Phase modulation – Pre emphasis and De emphasis – Inter system Comparison.

UNIT III:

Generation of AM – AM transmitter – Grid modulated class C amplifier – Plate modulated Class C amplifier – Modulated transistor amplifier – FM transmitter – Reactance modulator – Varactor diode modulator – Armstrong.

UNIT IV:

Radio receivers – TRF receivers – Superhetrodyne receiver – RF section and characteristics – Sensitivity – Selectivity – RF amplifiers – Image frequency and its rejection – FM receivers – Amplitude Limiting – Simple diode detector – Balanced slope detector – Phase discriminator – Ratio detector .

UNIT V:

Telephone systems – Telephone subscribers loop circuits – Electronic telephone – Telephone subscribers line interface circuit - Two wire repeaters – Public telephone network – Step by step switching – Cross bar switching – Digital switching – Trunk circuits – Private telephone networks.

Books for Study and Reference:

1. Electronic communication systems, G. Kennedy & Bernard Davis, 4th edition, Tata McGraw-Hill, India, 2005.
2. Electronic communications, Dennis Roddy & John Coolen, 4th edition, Prentice Hall of India, India, 1995.

V SEMESTER

T22 Core Theory

MATHEMATICS FOR ELECTRONICS

UNIT 1:

Finite differences – Difference table operator E , Δ , D - Relations between these operators – Difference equations – Linear difference equation - Homogeneous linear difference equation with constant coefficients.

UNIT II:

Interpolation using finite differences – Newton Gregory formula for forward interpolation Divided differences – Properties – Newton's formula for unequal intervals – Lagrange's formula – Relation between ordinary differences and divided differences.

UNIT III:

Solutions of algebraic and transcendental equation iterative method, Bisection method, Newton Raphson method. Solution of simultaneous linear equations – Gauss method - Gauss Jordan method – Iteration method – Gauss Seidel method.

UNIT IV:

Theory of equation – Relation between the roots and coefficients - Transformation of equation.

UNIT V:

Reciprocal equation - Approximate solution of equation – Newton's method and Homer's method.

Books for Study and Reference:

1. Mathematics for Electronics, K.C. Pillai.
2. Numerical analysis, Arumugam and Isaac.
3. Numerical analysis, Gupta and Kapoor.
4. Theory of equation, Arumugam and Isaac.
5. Algebra, Manikavasagam pillai.

V SEMESTER

T23 Core Theory

DIGITAL COMMUNICATION

UNIT I:

Sampling Process – PAM-Other forms of pulse modulation – Bandwidth - Noise trade off- Quantization - PCM-Noise considerations in PCM systems – TDM - Digital multiplexers- Virtues, Limitation and modification of PCM - Delta modulation - Linear Prediction - Differential pulse code modulation - Adaptive delta modulation.

UNIT II:

Matched filter - Error rate due to noise - Inter symbol Interference - Nyquist's criterion for distortion less base band binary transmission - Correlative level coding - Base B and M array PAM transmission - Adaptive equalization - Eye patterns.

UNIT III:

Introduction - Passband transmission model - generation, detection, signal space diagram, Bit error probability and power spectra of BPSK, QPSK, FSK and MSK schemes - Differential phase shift keying - Comparison of digital modulation systems using a single carrier - carrier and symbol synchronization.

UNIT IV:

Discrete memory less channels - Linear block Codes - Cyclic codes - Convolutional Codes - Maximum likely hood decoding of convolutional codes - Viterbi algorithm, Trellis coded modulation, Turbo codes.

UNIT V:

Pseudo - Noise sequences - A notion of spread spectrum – Digital sequence spread spectrum with coherent binary phase shift keying - Signal space dimensionality and processing gain-probability of error - Frequency-hop spread spectrum - Maximum length and gold codes.

Books for Study and Reference:

1. Communication systems, Simen Haykins, 4th edition, John Wiley, India, 2001.
2. Digital and Analog Communication, Sam K. Shunmugam, John Wiley & sons, Singapore, 1994.
3. Digital Communication, John G. Proakis, 3rd edition, Tata McGraw-Hill, India, 1995.
4. Principles of digital communication, Taub & Schilling, 28th reprint, Tata McGraw-Hill, India, 2003.

V SEMESTER

T24 Major Elective

VLSI DESIGN

UNIT I:

Basic MOS Technology: Integrated circuits era. Enhancement and depletion mode. MOS transistors. NMOS fabrication. CMOS fabrication. Transistor Theory: Introduction MOS Device Design Equations, The Complementary CMOS DC characteristics, The Transmission Gate, Tristate Inverter.

UNIT II:

Circuit design processes: MOS layers. Stick diagrams. Design rules and layout-lambda-based design and other rules. Examples. Layout diagrams. Symbolic diagrams. Basic Physical Design of Simple logic gates CMOS logic structures: CMOS Complementary Logic, Bi CMOS Logic, Pseudo-NMOS Logic, Dynamic CMOS Logic, Clocked CMOS Logic, Pass Transistor Logic, and CMOS Domino Logic Cascaded Voltage Switch Logic (CVSL).

UNIT III:

Basic circuit concepts: Sheet resistance. Area capacitances. Capacitance calculations. The delay unit. Inverter delays. Driving capacitive loads. Propagation delays. Wiring capacitances. Scaling of MOS circuits: Scaling models and factors. Limits on scaling. Limits due to current density and noise.

UNIT IV:

CMOS subsystem design: Architectural issues. Switch logic. Gate logic. Design examples-combinational logic. Clocked circuits. Other system considerations Clocking Strategies CMOS subsystem design processes: General considerations. Process illustration. ALU subsystem. Adders Multipliers.

UNIT V:

Memory registers and clock: Timing considerations. Memory elements. Memory cell arrays. Testability: Performance parameters. Layout issues. I/O pads. Real estate. System delays. Ground rules for design.

Books for Study and Reference:

1. Basic VLSI Design, Douglas A. Pucknell & Kamran E. Shraghian, 3rd edition, Prentice Hall of India, India, 2005.
2. Principles of CMOS VLSI Design: A Systems Perspective, Neil H.E. Weste & K. Shraghian, 2nd edition, Pearson Education (Asia) Pvt. LTD., India, 2000.
3. Fundamental of Semiconductor Devices, M.K. Achuthan & K.N. Bhat, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2007.
4. CMOS Digital Integrated Circuits: Analysis and Design, Sung-Mo Kang & Yusuf Leblebici, 3rd edition, Tata McGraw-Hill, New Delhi, 2007.
5. Analysis and design of Digital Integrated Circuits, D.A Hodges, H.G Jackson & R.S. Saleh, 3rd edition, Tata McGraw-Hill, New Delhi, 2007.

MP5 Core Practical V

V SEMESTER

COMMUNICATION LAB

(Any 12 experiments)

1. Generation & detection of AM.
2. Generation & detection of FM.
3. Characteristics of AM receiver (Selectivity & Sensitivity).
4. Characteristics of FM receiver (Selectivity & Sensitivity).
5. Pulse amplitude modulation.
6. Pulse width modulation.
7. Pulse position modulation.
8. Pre emphasis & de emphasis.
9. PCM encoder.
10. PCM detector.
11. ASK modulator and detector.
12. PSK modulator and detector.
13. Suppressed carrier AM.
14. Time division MUX and De-MUX.

VI SEMESTER

T26 Core Theory

OPTICAL FIBRE COMMUNICATION

UNIT I:

The nature of light – Linear polarization – Elliptical and circular polarization – Basic optical laws and definitions – Optical fibre modes and configurations – Fibre types – Rays and modes – Step index fiber structure – Ray optics representation – Dielectric slab waveguide – Mode theory for circular wave guide.

UNIT II:

Fibre materials – Fibre fabrication – Outside vapour – Phase oxidation – Vapour – Phase axial deposition - Modified chemical vapour deposition – Plasma – Activated chemical vapour deposition – Double – Crucible method – Mechanical properties of fibres.

UNIT III:

Elements of an optical fibre transmission link – Fibre optic cables – Attenuation – Absorption – Scattering losses – Bending losses – Core and cladding losses – Signal distortion in optical waveguides – Material dispersion – Waveguide dispersion – Polarization - mode dispersion – Refractive – index profiles of a single mode fibre.

UNIT IV:

Photodetectors – Physical principles of photodiodes – Avalanche photodiodes – Photo detector noise – Noise sources - Signal to noise ratio – Lensing schemes for coupling improvement – Fibre to fibre joints – Fibre splicing – Splicing Techniques – Optical fibre connectors.

UNIT V:

Measurements – Attenuation measurement (the cutback technique and insertion – loss method) - Dispersion measurements (Time domain and frequency domain inter model dispersion measurement chromatic dispersion) – Optical spectrum analyzers - Optical networks – Network topologies.

Books for Study and Reference:

1. Optical Fibre communication, Gerd Keiser, 3rd edition, Tata McGraw-Hill, India, 2000.

VI SEMESTER

T27 Core Theory

ADVANCED COMMUNICATION SYSTEM

UNIT I:

Satellite communication – Satellite orbits – Geo synchronous orbit – Orbital velocity – Round trip time delay – Antenna look angles – Satellite classifications – Spacing – Frequency allocation – System parameters analysis – Link equations – Link budget – Space craft subsystem (block schematic). Tracking and telecommand – Earth stations – Antenna systems – Receiver sub systems (block) – Functioning LNA – LNB – Down converter – Channel filters – Demodulators – INTELSAT/INMARSAT – Overview of INSAT.

UNIT II:

Types of satellite communication system - FSS, DSS - Direct broadcasting and community broadcast – Multiple Access Techniques – Introduction – FDM – FM - FDMA, PSK-TDMA, SSMA, CDMA - Switching Techniques – Circuit – Message – Packet switching – Packet satellite network – Domestic satellite system.

UNIT III:

The cellular concept – Introduction – Frequency reuse – Channel assignment – Hand off strategies – Prioritizing handoff – Co-channel interference and system capacity – Channel planning – Adjacent channel interference – Cell splitting – Sectoring – Repeaters – Micro-cell concept – Blue tooth technology – Fundamental and Applications.

UNIT IV:

Wireless communication system-paging-cordless & cellular system – Comparison – Second generation cellular networks – Third generation cellular networks – Global system block – Positioning – Applications.

UNIT V:

Spread spectrum techniques and Remote sensing - Pseudo noise sequences - Time hopping - Frequency Hopping - Robustness - Fast and slow hopping – Hybrid and Chirp spread spectrum – Synchronization – Acquisition – Tracking - Concepts of jamming - Analysis of DS/SS- Analysis of avoidance - Generation of signals – Detection - Applications.

Books for Study and Reference:

1. Electronic communication system fundamentals, Wayne Tomasi, 5th edition, Pearson Education, India, 2004.
2. Wireless communication principles and practice, T.S. Rappaport, 2nd edition, Prentice Hall of India, India, 2002.
3. Satellite Communication, Gagliardi, 1st edition, CBS Publishers, India, 2004.
4. Digital Communication Fundamentals and applications, B. Sklar, 2nd edition, Prentice Hall, India, 2001.
5. Digital Communication, Saymon Haykin, Reprint - 2009, John Wiley & Sons, India.
6. Space Communication Systems, Filipowasky, McGraw-Hill.

VI SEMESTER

T28 Core Theory

COMPUTER NETWORKS

UNIT I:

Network goals – Topologies – Configurations - Concept of internet - ISO-OSI 7 Layer Standard - Peer processes - Functions of each layer - TCP/IP reference model - Transmission media - Description and characteristics - Full duplex, half duplex links Concepts of WAP technology

UNIT II:

MODEMS - Serial communication standards - X-21 digital interface - Need for data link layer - Stop and wait and sliding window protocol – HDLC - Terminal handling - Polling-multiplexing – Concentration - Virtual circuit data-grams-routing-congestion control.

UNIT III:

LAN - base band and broad band Lan's - Carrier sense networks - CSMA/CD-ring network-shared memory - IEEE802 standards - Introduction to X-25. Transport layer - Design issues - Establishing and releasing connection - Flow control – Buffering - Crash recovery.

UNIT IV:

Session layer - Design issues - Data exchange – Dialogue - Dialogue management - Synchronization - Remote procedure call - Client server model - Presentation layer - Data presentation - Compression - Network security - Privacy - Cryptography.

UNIT V:

Application layer - Virtual terminal - File transfer protocol - E-mail – ATM - Protocol architecture - ATM logical connections - ATM cells-cell transmission - ATM adaptation layer - AAL protocols - Basic principles of SDH and SONET.

Books for Study and Reference:

1. Computer Networks, Andrew S. Tannenbaum, 5th edition, Prentice Hall, India, 2010.
2. An Engineering Approach to Computer Networking, S. Keshav, Pearson Education, India.
3. Computer Networking: A Top-Down Approach, Kurose, 5th edition, Pearson Education, India, 2009.
4. Computer Network & Internet, Comer, 4th edition, Pearson Education, India, 2004.
5. Data communication, Hausly.
6. Computer Networks, protocols standards and interfaces, Uyles D. Black, 2nd edition, Pearson education. India, 1993.

VI SEMESTER

T29 Core Theory

ANTENNAS

UNIT I:

Antenna Basics: Introduction, Basic antenna parameters, Patterns, Beam area, Radiation Intensity, Beam efficiency, Diversity and gain, Antenna apertures, Effective height, Bandwidth, Radiation, Efficiency, Antenna temperature and antenna field zones.

UNIT II:

Point Sources and Arrays: Introduction, point sources, Power patterns, Power theorem, Radiation intensity, Field patterns, Phase patterns. Array of two isotropic point sources, Non-isotropic but similar point sources, Principles of pattern multiplication, Examples of pattern synthesis by pattern multiplication, Non-isotropic point sources, Broad side array with non-unipolar amplitude distribution, Broad side versus end fire array, Direction of maxima fire arrays of n isotropic point sources of equal amplitude and spacing.

UNIT III:

Electric dipoles and thin linear antennas: Introduction, Short electric dipole, Fields of a short dipole, Radiation resistance of short dipole, Radiation resistances of $\lambda/2$ Antenna, Thin linear antenna, Micro strip arrays, Low side arrays, Long wire antenna, Folded dipole antennas.

UNIT IV:

Loop, Slot, Patch and horn antenna: Introduction, Small loop, Comparison of far fields of small loop and short dipole, Loop antenna general case, Far field patterns of circular loop, Radiation resistance, Directivity, Slot antenna, Balun's principle and complementary antennas, impedance of complementary and slot antennas, Patch antennas, Horn antennas, Rectangular horn antennas.

UNIT V:

Antenna Types: Helical Antenna, Yagi-Uda array, Corner reflectors, Parabolic reflectors, Log periodic antenna, Lens antenna, Antenna for special applications - Sleeve antenna, Turnstile antenna, Omni directional antennas, Antennas for satellite antennas for ground penetrating radars, Embedded antennas, Ultra wide antennas, Plasma antenna.

Books for Study and Reference:

1. Antennas, John D. Krauss, 3rd edition, McGraw-Hill International edition, NewYork, 2006.
2. Antennas and Wave Propagation, Harish & Sachidananda, Oxford Press, USA, 2007.
3. Antenna Theory analysis and Design, C.A. Balanis, 2nd edition, John Wiley, India, 1997.
4. Antennas and Propagation for wireless communication, Sineon R Saunders & Alejandro Aragon-Zavala, 2nd edition, Wiley, London, 2007.
5. Systems, John Wiley, 2003.
6. Antennas and wave propagation, G.S.N. Raju, Pearson Education, India, 2005.

VI SEMESTER**T30 Major Elective II****POWER ELECTRONICS****UNIT I: Power Semiconductor Devices**

Power diode, Power transistor, TRIAC, MOSFET and IGBT _ turn on methods, drive circuits – SCR characteristics – Two transistor analogy – Methods of turning on and turning off – Series and parallel connections of SCRs

UNIT II: Phase Controlled Converters

Single phase controlled rectifier – Half wave controlled rectifier with resistive load, RL load, RL load and battery – Full wave controlled rectifier with resistive load, RL load, RL load and battery – Three phase controlled rectifier – HVDC transmission.

UNIT III: Inverters

Single phase and Three phase inverters – Series and parallel inverters – Bridge inverters – Current source inverters.

UNIT IV: Choppers & Cycloconverters

Various types of DC choppers – Step up chopper – AD chopper – Single phase AC chopper – Step up and step down Cycloconverters – Three phase to single phase and Three phase to Three phase Cycloconverters.

UNIT V: Control Circuits and Applications

Generation of control pulses – Microprocessor based implementation – Static circuit breakers for DC and AC circuits – Regulated power supply – UPS – SMPS.

Books for Study and Reference:

1. Industrial Electronics and Control, S.K. Bhattacharya & S. Chatterjee, Fourth reprint 1999, Tata McGraw Hill, India, 1995.
2. Industrial Electronics, J. Gnanavadivel, R. Dhanasekaran & P. Maruthupandi, 1st edition, Anuradha publications, India, 2011.
3. Power Electronics, M.H. Rashid. 3rd edition, PHI Pearson, India, 2004.
4. Power Electronics, P.C. Sen, 30th reprint, Tata McGraw Hill, India, 2008.
5. Thyristorised Power Controllers, G.K. Dybey, 1st edition, Wiley Eastern Ltd., India, 1986.
6. An introduction to Thyristors and their applications, M. Ramamoorthy, 2nd edition, East west press, India, 1991.

VI SEMESTER

MP6 Core Practical VI

ELECTRONIC SYSTEM DESIGN LAB

(Any 12 Experiments)

1. Design and construction of fixed voltage power supply.
2. Design and construction switching power supply.
3. Design and construction of 1.5V to 12V power supply.
4. Design and construction of Burglar alarm using LDR.
5. Design and construction of temperature switch using Thermistor.
6. Design and construction of light sensitive switch using photo diode.
7. Design and construction of audio amplifier using LM 380.
8. Design and construction of timer circuit.
9. Design and construction of Decade counter/Seven segment decoder.
10. Design and construction of logic probe.
11. Design and construction of photo transistor circuit.
12. Design and construction of the circuit of Thermistor.
13. Design and construction of the circuit of transistor switch.
14. Design and construction of voltage doubler circuit.

APPENDIX – AZ61

MANONMANIAM SUNDARANARUNIVERSITY, TIRUNELVELI-627012
B.SC.COSTUME DESIGN AND FASHION
(Effective from the Academic Year 2012-2013)

SCHEME OF EXAMINATION – CBCS PATTERN

SEMESTER-III

Part	Study components	Course title	Hours per week	Examinations				
				CIA	Univ. exam	Total marks	hours	Credit
I	Core –V	Fashion and Clothing Psychology	6					
II	Core –VI	History of Costume	6	25	75	100	3	3
III	Core –VII Practical	Construction of Women’s Wear	6	25	75	100	3	3
	Allied –III	Technology of Fabric Manufacturing	4	25	75	100	3	4
	Skill Based Course –I	Embroidery and surface working (or) Costume development	6	40	60	100	3	4
IV	Non-Major Elective – I	Fashion Concept (or)	2					
		Embroidery and surface working		25	75	100	3	2
			30					

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SEMESTER IV

I	Core-VIII	Application of computer in Apparel Industry	6					
II	Core –IX Practical	Computer Aided Apparel Designing	4	25	75	100	3	3
III	Allied –IV	Technology of Dyeing and Printing	4	25	75	100	3	3
	Allied Practical	Textile Wet Processing	2	25	75	100	3	3
	Skill Based course –II	Effective communication(or) Personality Development	6	25	75	100	3	3
	Non-Major Elective –II	Fashion Illustration (or) Fibre to fabric	2	25	75	100	3	3
	Major elective I	Apparel Export Trade Documentation	6					
	TOTAL		30	25	75	100	3	3

1220

20

SEMESTER-V

Part	Study components	Course title	Hours per week	Examinations				
				CIA	Univ. exam	Total marks	hours	Credit
III	Core X:	Apparel Production Management	4	25	75	100	3	4
	Core XI:	Garment Costing	4	25	75	100	3	4
	Core-XII	Textile Testing and Quality Control	4	25	75	100	3	4
IV	Core-XIII – (Practical)	Construction of Men's wear	8	40	60	100	3	4
	Skill Based Course	Fashion Photography (or) Art portfolio	4	25	75	100	3	4
V	Major elective	Technology of Textile Finishing	6	25	75	100	3	5
	TOTAL		30					25

SEMESTER VI

III	Core –XIV	Care and Maintenance of Textiles	4	25	75	100	3	4
	Core – XV	Technical Textiles	4	25	75	100	3	4
	Core-XVI	Quality Control in apparel production	4	25	75	100	3	4
	Core- XVII	Entrepreneurial Development	4	25	75	100	3	4
	Core-XVIII	Draping Technology	6	25	75	100	3	4
IV	Core – XIX - Practical	Textile Testing and Care	8	40	60	100	3	4
		Extension Activities	-	-	-	-	-	1
	TOTAL		30					25

SEMESTER-III

CORE-V

FASHION AND CLOTHING PSYCHOLOGY

UNIT-I

Factors influencing fashion changes –Psychological needs of fashion , Social psychology of Fashion , technological , economical , political ,legal and seasonal influence .role of costume as a status symbol , Personality and dress, cloths as sex appeal, cultural value Fashion cycles, repetition of fashion .

UNIT-II

Fashion evolution – Fashion cycles , Length of cycles , consumer groups in fashion cycles – fashion leaders , fashion innovators, fashion motivation , fashion victim, fashion victims ,Fashion followers .Adoption of Fashion – trickle down , trickle up and trickle across theory.Fashion forecasting – market research , evaluating the collection , Fashion services and resources (fashion services ,Colour services ,video services , News letter services, web sites ,Directories and references),Design- Historic and ethnic costumes.

UNIT-III

Visual merchandising of fashion , types of displays – window displays , interior displays , Elements of display – the merchandise , mannequins and forms , props , signage , lighting.Merchandising presentation – tools and techniques- back drop, forms, fixtures. Fashion show- Definition , planning ,budgeting, location, timings, selection of models, collection,set design ,music , preparing the commentary , rehearsal .

UNIT-IV

Fashion Advertising and preparation of advertising for apparel market , Advertising media used in apparel market – Advantages and limitations, Advertising department – structure and functions , advertising agencies – structure and functions . Advertising Budget.

UNIT-V:

Fashion designer – types – classicist, idealist, influenced, realist and thinking poet. Brief study on Indian Fashion designers and World Fashion Designers.

References;

1. Retail Fashion promotion and Advertising – Drake et-al , Macmillan publications company
2. Fashion –From concept to consumer – Gini Stephens Frings , 6th edition, prentice Hall (1999).

3. Inside the fashion business –Bennett, Coleman & Co, Mumbai(1998).
4. Art and Fashion in clothing selection – Harriet T, McJimsey, The Iowa state university press, Ames, Iowa (1973).

CORE-VI

HISTORY OF COSTUME

UNIT-I:

Beginning of costume- Growth of dress- Painting, cutting, scarring and tattooing. Origin of clothing. Factors influencing costume changes.

UNIT-II:

Costume of Ancient civilization- Egypt, Greece and Rome.

UNIT-III:

Costumes of India. Traditional costumes of different states of India. Accessories and Ornaments used in India.

Traditional woven textiles of India- Dacca Muslin, Jamdani, Chanderi, Brocades, Baluchijar, Himrus and Amrus.

UNIT-IV:

Traditional dyed and printed textiles of India.

Ikat textiles – Bandhani, Patola.

Printed textiles – Kalamkari, Block printed fabrics.

UNIT-V:

Development of costumes in different countries – France, China, Russia, England and America.

Reference:

1. Costumes of India and Pakistan – S.N.Das
2. Costumes and Textiles of India – Jamila Brij Bhushan
3. Costume of India – Dorris Flyn
4. Historic costume – Lesla K.T.

CORE VII - PRACTICAL

CONSTRUCTION OF WOMEN'S WEAR

1. SIX GORE SAREE PETTICOAT

Feature:

- a) Six panel
- b) Frilled edge

2. FOUR GORE SAREE PETTICOAT

Features:

- a) Four panel
- b) Frilled edge

3. BLOUSE:

Features:

- a) front open
- b) Fashion neck
- c) Waist band
- d) Any sleeve

4. MIDDI

Features:

- a) With (or) without open
- b) Waist band of elastic
- c) Panel

5. MIDDITOP

Features:

- a) Back (or) Front open
- b) Collar
- c) Fashioned full sleeve with or without cuff.

6. NIGHT DRESS

Features:

- a) Front open
- b) With or without collar
- c) Elastic or Cord Attached at waist

7. NIGHTY

Features:

- a) Yoke
- b) Bell sleeve
- c) Gathered bottom
- d) Attaching trimmings.

8. KURTA

Feature:

- a) Fashioned neck
- b) Fashioned sleeve
- c) Side seam slit.

9.SALWAR

Features

- a) Gathered waist with tape or elastic
- b) Bottom design

10..KAMEEZ

Features:

- a) Fashioned front body
- b) Back or Front open
- c) Fashioned neck
- d) Fashioned sleeve.

Reference:

- a. Practical Clothing Construction Part-I & II – Mary Mathew
- b. Zarapkar System of Cutting - K.R.Zarapkar
- c. Easy Cutting – Juvekar
- d. Commercial system of cutting – Juvekar
- e. Dress making – Smt. ThangamSubramaniam

ALLIED III

TECHNOLOGY OF FABRIC MANUFACTURING

UNIT-I:

Fabric forming Techniques – Weaving . Definition -Sequencing of weaving preparation process – Terms related to woven fabric –Loom – Definition- Important motions of a loom – Classification of looms- Parts of loom- Passage of material through looms – Shuttle loom, Shuttle less loom.

UNIT-II

Elements of woven design – classification of weaves – Elementary weaves and decorative weaves. Derivatives of plain and twill. Honey comb, Crepe, Huck-a back, Mock-leno, Pile, Double cloth, leno , swivel Brief study on dobby and jacquard designs.

Unit III :

Knitting –Definition , Terms . Comparison of weaving and knitting – Principles and Comparison of weft and warp knitting - Classification of knitting machines – Basic knitting elements. Weft knitting –definition Weft knit structure- Single jersey , Rib, Interlock, Purl. Yarns used for weft knitting. Defects in weft knitted fabrics. Circular rib knitting machines - elements and functions. Interlock knitting machines- elements and functions.

UNIT-IV:

Warp knitting- definition .Knitting machines- Variations in warp knitting – Tricot machine- knitting cycle. Raschel machines- knitting cycle.Comparison of Tricot and Raschel. Yarn for warp knitting , Defects in warp knitted fabrics. Non-apparel use of knitted goods.

UNIT-V:

Non-woven fabric – Definition – Manufacturing methods and end-uses. Brief study on Braiding, Felt, fur, and Net material.

Reference:

1. Bernard – P. Corbmann , “ Textile fibre to fabric” – International Students Edition , Mcgraw Hill Company 1985.
2. PremalathaMullick, “ Text book of textile designing” , Kalyani Publisher, New Delhi, 2006.
3. Indian Textile Journals
4. Wynne. A, “ The Motivate Series – Textiles” Macmillan Education Ltd.,
5. Joseph J.Pratal, “ Fabci Science” fifth edition, Fairchild Pulications, 1990.

SKILL BASED COURSE - I

EMBROIDERY AND SURFACE WORKING

UNIT I:

Fundamentals of Embroidery- General rules for hand and machine embroidery. Selection of material, thread, and needle. Methods of tracing design.

UNIT-II:

Origin of Indian Embroidery. Embroidery stitches used – Kashida of Kashmir, Kantha of Bengal, Phulkari of Punjab, Embroidery of Kutch and Kathiawar, Zari embroidery, Kasuti of Karnataka, Chikankari of Luck now- Types, Colours ,Motiffs, Fabric used and their historical importance.

UNIT-III:

Hand embroidery stitches- Running, Stem , Blanket, Lazy daisy, Chain, Couching, Herringbone, Fish bone, Feather- single and double, Rumanian seeds, Cross, Fly, Satin, Long and Short, French Knot, Bullion knot, Double knot, Lettering – Alphabets and Monogram work.

UNIT- IV:

Machine Embroidery stitches – Running, cording, Satin, Long and Short, Granite, Eyelet, Cutwork, Letters Monograms, appliqué on net.

UNIT- V:

Creating style through surface trimmings and Bias trimmings , Ric-Rac, Ruffles, Smocking, Faggoting, Drawn thread work, Cut work, Lace, Lace motif, Belts and Bows , Quilting , Crocheting, Tatting, Hand knitting – Elements and formation of Knit, Purl.

Patch work, Appliqué work – Velvet, Plain, printed appliqué. Mirror work, Sequins, Patch work, Bead work, Shadow work, Fabric painting- using fabric colors, glitters, pastes.

Reference:

1. Practical clothing construction Part I, II – Mary Mathews
2. Indian embroidery – Kamaladevi
3. Creative art of embroidery – Barbara snook.

SKILL BASED COURSE -I

COSTUME DEVELOPMENT

UNIT-I

Beginning of costume- Growth of dress- Painting, cutting, scarring and tattooing. Origin of clothing. Factors influencing costume changes.

UNIT-II:

Costume of Ancient civilization-Egypt, Greece and Rome.

UNIT-III:

Costume of India. Traditional costumes of different states of India. Accessories and Ornaments used in India.

UNIT-IV:

Traditional woven textiles of India- Dacca Muslin, Jamdani, Chanderi, Brocades, Baluchijar, Himrus and Amrus.

UNIT-V:

Traditional dyed and printed textiles of India.

Ikat textiles – Bandhani, Patola.

Printed textiles – Kalamkari , Block printed fabrics.

Reference:

1. Das .N ”Costumes of India and Pakistan” Taraporevelason ,1982.
2. JamilaBrijBhusan “ Costumes and Textiles of India”
3. . DorrisFlyn “Costume of India –“
4. .Lesla K.T. “Historic costume “

NON-MAJOR ELECTIVE- I

FASHION CONCEPT

UNIT-I

Definition of Fashion, Style, Classic, Fad, Fashion cycle. Term related to fashion industry, Mannequin , Boutique, Collection, Fashion shows, apparel catalogue, Fashion Clinic.

U NIT-II

Design- definition and types. Elements of design - Line, Shape, Size, texture, Colour. Creating Variety in dress through elements of design.

UNIT-III

DESIGN principles – Harmony, Proportion, balance, Rhythm, Emphasis. Application of principles in dress.

UNIT-IV:

Colour – definition and qualities. Prang colour chart. Colour harmony- Monochromatic , Analogous, Complementary, Triad and Tetrad colour harmony.

UNIT-V

Merchandising- definition ,and types . Fashion merchandising. Principles and techniques, Merchandiser- role and function.

Reference:

1. Jenny Davis. “ Acomplete guide to Fashion Designing” – Abishek Publications 2007.
2. GinyStephen ,Frings “ Fashion from Concept to Consumer” Pearson Educations 2008.
3. Leste Davis Burns ,Naran O Bryant “ The business of Fashion “ , Fairchild Publications, Newyork 2002.
4. Ravichandran P and Narasima R “ Textile Marketing and Merchandising”, SSM Institute of textile Technology, 2005.
5. MeenakshiNarag“ Hand book of FashionTechnology” Asia Pacific Business Press, 1996.
6. NirupamaPundir“Fashion Technology today and tomorrow, Mittal Publications 2007.

NON-MAJOR ELECTIVE -I

EMBROIDERY AND SURFACE WORKING

UNIT I:

Fundamentals of Embroidery- General rules for hand and machine embroidery. Selection of material, thread , and needle. Methods of tracing design.

UNIT-II:

Origin of Indian Embroidery. Embroidery stitches used – Kashida of Kashmir, Kantha of Bengal, Phulkari of Punjab, Embroidery of Kutch and Kathiawar, Zari embroidery, Kasuti of Karnataka, Chikankari of Luck now- Types, Colours ,Motiffs, Fabric used and their historical importance.

UNIT-III:

Hand embroidery stitches- Running, Stem , Blanket, Lazy daisy, Chain, Couching, Herringbone, Fish bone, Feather- single and double, Rumanian seeds, Cross, Fly, Satin, Long and Short, French Knot, Bullion knot, Double knot, Lettering – Alphabets and Monogram work.

UNIT- IV:

Machine Embroidery stitches – Running, cording, Satin, Long and Short, Granite, Eyelet, Cutwork, Letters Monograms, appliqué on net.

UNIT- V:

Creating style through surface trimmings and Bias trimmings , Ric-Rac, Ruffles, Smocking, Faggoting, Drawn thread work, Cut work, Lace, Lace motif, Belts and Bows , Quilting , Crocheting, Tatting, Hand knitting – Elements and formation of Knit, Purl. Patch work, Appliqué work – Velvet, Plain, printed appliqué. Mirror work, Sequins, Patch work, Bead work, Shadow work, Fabric painting- using fabric colors, glitters, pastes.

Reference:

1. Practical clothing construction Part I, II – Mary Mathews
2. Indian embroidery – Kamaladevi
3. Creative art of embroidery – Barbara snook.

SEMESTER –IV

CORE VIII

APPLICATION OF COMPUTERS IN APPAREL INDUSTRY

UNIT-I

Classification of computers, computer generations, computer specification ,organization ofcomputer sections .Types of storage devices (primary and secondary) ,input devices , output devices .

UNIT-II

Role of computers in fashion industry – Information flow – CAD, CAM,CIM,CAA,PDC –Definition and functions.
Computers in production planning and production scheduling ,computerized colour matching system.

UNIT-III

CAD in designing.

Textile designing – Weaving , Knitting and printing.

Creating embroidery designs.

Garment designing – 2D and 3D forms .

UNIT-IV

CAD in pattern making and grading – system description – information flow – process involved in pattern making , process involved in pattern grading.

UNIT-V

Computer application in fabric defect checking, laying / spreading, cutting marker planning, labeling – parts and functions. Computerized sewing machines .

References;

1. Clothing Technology – Hannelore Eberle et –al, Verlaag Europa – Lehrmittel, Vollmer GmbH & Co 4287, Haan – Gruilen.
2. Computer Fundamentals – P K Sinha , BPB Publications, Delhi (1992)
3. The technology of clothing manufacture – Harold Carr and Barbara Latham, Blackwell Ltd (1994)
4. Pattern Grading for Women’s Cloths The Technology of sizing – Gerry Cooklin, Blackwell Science Ltd (1990)

CORE- IX PRACTICAL

COMPUTER AIDED APPAREL DESIGNING

Create the following designs

1. Motifs / small designs.
 - Embroidery designs for Kerchiefs , Neck lines
 - Chest prints for T-shirts
2. Children’s Garments
 - Jabla- different styles
 - Frocks- different styles
 - Middi and Tops - different styles
3. Women’s Garments
 - Churidhar- different styles
 - Full gowns - different styles
 - Middi & Tops - different styles
 - Princess line Dress- different styles.
 - House coats, Aprons, Nighties

4. Men's Garments

- S B vest
- T- Shirt - different styles
- Shirts - different styles
- Kurtapyjama - different styles

5. Create logos for branded companies.

- 6. Create label for garments / companies
- 7. Prepare charts for production planning and scheduling

ALLIED -IV

TECHNOLOGY OF DYEING AND PRINTING

UNIT-I

Typical sequence of process. Singeing – objects and types – Machines. Desizing –objects , types. Scouring – objects and processes carried out during scouring.

Wet processing equipment – Kier, J-Box, Stenter.

Bleaching – Definition and objectives- Bleaching methods using Hypo chlorites, Hydrogen peroxide, Sodium chlorite.. Mercerisation – Theory process, Methods – Chain and chainless process

UNIT-II:

Dyeing- Definition, Theory of dyeing. Properties required for dye stuff-classification of colorants . Dyeing procedure using various dye stuffs – Direct dyes, Reactive dyes, Acid dyes, basic dyes, Azo dyes, Vat dyes, Sulphur dyes, Disperse dyes.

UNIT-III:

Brief study on Dyeing machines for Loose cotton fibre dyeing, Yarn dyeing, Package dyeing, Fabric dyeing and garment dyeing.

UNIT-IV:

Printing – definition .differentiate dyeing and printing. Essential ingredients used in Printing paste. Basic styles of printing – direct, Discharge, Resist style. Printing of Cellulose Fabric, Printing of Wooland silk, Printing of Polyester and Nylon.

UNIT V:

Printing methods- Stencil , Batik, Block, tie and Dye. Printing techniques in Industries- Screen – Hand screen, Flat screen, Rotary Screen, Transfer printing, Flock printing, Photo printing etc.

Reference:

1. Technology of textile processing Vol III, V, VII, VIII – V.A. Shenai.
2. Hand book of Textiles - P.V.Vidyasagar.

ALLIED PRACTICAL

TEXTILE WET PROCESSING

Preparation of samples for:

1. Desizing
2. Scouring
3. Bleaching
4. Dyeing of Cotton with direct dyes, Reactive dyes, vat dyes, sulphur dyes,
5. Dyeing of wool , silk, rayon with Acid and basic dyes.
6. Dyeing of polyester
7. Hand Screen Printing
8. Stencil printing
9. Block printing
10. Batik Printing
11. Tie and dye

NON-MAJOR ELECTIVE -II

FAHION ILLUSTRATION

UNIT-I

Human anatomy- study of human anatomy in terms of shapes , size and movements. 8 head theory.

UNIT-II

Drawing the average figure, stick figure and fleshy figure. Basic figures of men, women and children.

UNIT-III

Line drawings , head and face. Drawing the faces- proportions and placement of facial features. Drawing hair style and accessories.

UNIT-IV

Stylised drawing – drawing from photograph , pattern and textures. Drawing a range of fashion garments.

UNIT-V

Fashion designing for persons having unusual figures- stout figure, tall figure, short figure , long neck , large bust, small waist, large hip.

REFERENCE:

1. Grace Prakasan, “Figure drawing made easy” VikramP.Ubale Ltd., 2000.
2. Julian Seaman” Fahion Illustration” B.T. Bats ford Ltd., 1996.
3. Patrick John Ireland, Fashion Design Illustration” B.T. Bats ford Ltd., 1996.
4. Art in Everyday lif- Glodstein and Goldstein.
5. Mathews M.Practical clothing construction. Part III cosmic press, Madras.
6. Brockman C.H. “The Theory of Fashion in Design” John Willy and sonsinc.Newyork.
7. Mc. Imsy and Harriet ;Art and Fashion in Clothing Construction”, Lowa State University Press- Iowa.

NON-MAJOR ELECTIVE -II

FIBRE TO FABRIC

UNIT-I

Introduction to the field of textiles- classification of fibres –natural and chemical – primary andsecondary characteristics of textile fibers.

UNIT-II

Manufacturing process ,properties and uses of natural fibres – cotton ,linen ,Jute , pineapple,hemp ,silk , wool, hair fibers, man-made fibres –Viscose rayon ,acetate rayon , nylon, polyester,acrylic.

UNIT-III

Spinning –Definition ,Classification – Chemical and mechanical spinning –blending , opening, cleaning ,doubling ,carding ,combing ,drawing ,roving ,spinning.
Yarn classification – definition , classification – simple and fancy yarns , Sewing threads and its properties.

UNIT-IV

Wovens- basic weaves –plain, twill, satin.
Fancy weaves- pile, double cloth, leno, swivel, dobby and jacquard.

UNIT-V

Non-Wovens- felting, fusing, bonding ,lamination ,netting, braiding and calico,tatting and crocheting.

References;

1. Textiles –fibre to fabric, Corbmann B.P, International student’s edition, McGraw Hill 2. Book company, Singapore 1985.
2. Fabric Science 5th edition , Joseph J Pretal , Fairchild Publications ,Newyork 1990.

MAJOR ELECTIVE –I**APPAREL EXPORT TRADE DOCUMENTATION****UNIT-I;**

Export trade – definition and functions – benefits and problems of international trade- Global scenario of apparel industry, Prospects for Indian apparel in overseas market.

UNIT-II:

Globalisation – features and factors favouring globalization. Impact of globalization in apparel industry. WTO – Objectives , Principles and functions . Role of WTO in Apparel Export.

GATT – Objectives and functions ,Agreements signed by India with importing countries.

UNIT-III:

Export promotion measure- market development assistance, Cash compensatory fund , duty draw back , Free TradeZone, 100% EOU, technology up gradation fund scheme, Export promotional activities of AEPC.

UNIT-IV:

Institutional finance for export – Pre-shipment and post –shipment finance. Export finance through finance-World bank , EXIM bank , IFC, IFM.Policies – EXIM policy , Marine insurance policy, ECGC.

UNIT-V:

Export procedures and documents- Export contracts- exchange control regulations- E-Commerce. Procedures to start garments Export company.

Reference:

- a. Jeevanantham. C – “ Foreign Trade” – Sultan Chand and Sons , 2005.
- b. Vairamani. K “ Import Export Procedures” KMS University, 2004.
- c. Pradeep Joshi “ Apparel and TextileExports” CBS Publishers, 2006.
- d. Rajesh Bheda “Managing Productivity in the apparel Industry” CBS Publishers 2003.
- e. Balagopal.T.A.S.”Export Marketing” Himalaya Publishing house, 1995.

APPAREL PRODUCTION MANAGEMENT

UNIT-I

Introduction to structure and sectors of clothing industry – function and types of organizational structure. Introduction to garment industry plant location. Types of plant layout – process, product and combination layout.

UNIT – II:

Study of different production systems – batch – group – individual systems – advantages and disadvantages of complete garment system. Individual part system- progressive bundling system – synchronized straight line products.

UNIT –III:

Study and planning of process involved up to fabric storage, study and planning for processing involved in the process for various garments. Preparation of production process flow charts. Preparation of production schedule for children's , women's and men's wear. Difference between production schedule for woven and knitted garment production.

UNIT-IV:

Production planning and control of raw material – machinery- labour . Estimation of machinery requirements. Estimation of labour requirements . Study of fabric waste and utilization of fabric waste- Maintenance of machinery and equipments- Maintenance schedule for preventive maintenance.

UNIT- V:

Job shop, open job shop, closed job shop, forecasting , technological forecasting, planning to meet seasonal sales of demand. Economical batch quantity various records, charts and data used in garment industry. Production planning for Export markets.

Reference:

- 1.Ravindranath V Bedi, Prof.Narayanase V.Bedi “ Modern Production Management” Vrinda Publications Ltd.,
- 2.Rajesh Bheda, Managing Productivity in the Apparel industry” CBS Publications 2003.
3. Chuter A.J. “Introduction to clothing production management Blackwell Publishing House 1995.
4. Harold Carr and Barbara Latham “Technology of clothing Manufactures” Blackwell Publishing House, 1994.

Semester V

Core XI

GARMENT COSTING

UNIT –I:

Principles of costing – requirement of good costing system – cost unit- types of cost – Fixed cost – Variable cost – Semi variable cost – Conversion cost – Replacement cost – Differential cost – Imputed cost – Sunk cost – Research cost – Development cost – Policy cost – Shutdown cost.

UNIT-II:

Elements of cost – Direct material cost – Direct expenses – Direct wages – Indirect material cost – Indirect expenses – Indirect labour overheads- Production overhead – Administrative overhead –selling overhead – Distribution overhead – Prime cost – Work cost – Cost of production – Total cost.

UNIT – III:

Cost estimation of yarn, fabric and components, dyeing, printing and finishing. Cost estimation for cutting, stitching, checking, packing, forwarding, shipping and insurance.

UNIT –IV:

Cost of product development. Analysis of Design cost- profit design – product profitability.

Function of cost control – Apparel manufacturing cost categories – sales cost control – purchasing cost control – production cost control- Administration cost control – Cost rating policies. Manufacturing budget. Cash flow control – standard cost sheet – Break even Charts.

UNIT- V:

Costing of various garments – Children’s wear , Women’s wear, Men’s wear.

Reference:

- 1.Apparel Manufacturing Analysis – Solinger Jacob
- 2.Production Costing – Khanna Publications
- 3.Development Banks and Enterprises
4. Fashion Design and Product Development – Harold Carr/ John
- 5.Garment Technology for Fashion Designer –Gerry Cooklin.

Semester V

Core-XII

TEXTILE TESTING AND QUALITY CONTROL

UNIT – I

Introduction to Textile Testing and Quality Control – Definition, General aspects of Textile testing and quality control, Routine tests performed in Textile Industry. Benefits of testing, International standards for textile and apparel testing.

UNIT – II

FIBRE ANALYSIS:

Identification of Textile Fibre – Burning, Solvent, Longitudinal and Cross sectional view of Cotton, Wool, Polyester, Nylon, Acrylic fibres. Cotton fibre length, Cotton fibre strength, Fibre fineness and Nep Potential – Trash.

UNIT – III

YARN ANALYSIS:

Yarn numbering, Yarn strength, Twist testing, Additional test for fibres and Yarn –Microscope, Weight method, Air flow method, Wet strength and elongation of filament yarn, Knot strength, Loop strength for filament yarn, Crimp.

UNIT – IV

FABRIC ANALYSIS:

Length, Width, Bow, Skew ness, Weight, Thickness, Breaking Strength, Abrasion Resistance, Crease Recovery, Stiffness of fabrics and drapability.

UNIT – V

Standards and specification in Textile Industry, Quality control aspects, Colour fastness tests in Textiles – Crocking, Perspiration, Sunlight, Laundering.

Reference:

- 1.Booth J.E.Principles of Textile Testing, CBS Publishers, 1996.
- 2.Elliot.B.Grover and Hamby.D.S.Textile Testing and Quality Control, Eastern Ltd.,
- 3.Satish K.Bhardwaj and Pradip , V. Metha, Managing Quality in Apparel Industry, Newage Internaional Publishers,2000.

SEMESTER –V

CORE PRACTICAL-XIII

CONSTRUCTION OF MEN’S WEAR

- **Designing, drafting and constructing the following garments for the features prescribed.**
- **List the measurements required and materials suitable**
- **Calculate the cost of materials.**
- **Calculate the material require layout method and direct measurement method.**

1. SLACK SHIRT:- Collar, Patch pocket ,Half sleeve.
2. T – SHIRTS:- Front half open, zip attached, Collar.
- 3.. FULL SLEEVE SHIRT:- Collar, Patch pockets, Full sleeve with cuff.
- :
4. PLEATED TROUSERS :- Pleats in front Dart at back ,Side pockets, Fly with buttons (or) zip, Belt with adjustable strap
- 5.. BELL BOTTOM:- Narrow bottom,Pleatless,Side Pockets, Fly with Zip/button
6. KALIDAR KURTA:- Kali piece,Side pocket, Stand collar, Half open
- 7.. NEHRU KURTA :- Half open, Round neck , With (or) without pockets, Full sleeve
- :
- 8.. JEANS:-Tight fitting, Jeans cut, Pockets
- 9.. PYJAMA :-Tape (or) Elastic attach waist, Fly
10. SINGLE BREAST VEST:- With or without Collar, Sleeveless ,Button attached
11. SINGLE BREAST COAT :- Coat collar ,Coat sleeve, Pockets
12. HOUSE COAT :-Round neck (or) collar attached, Over lap front, Tape attached

REFERENCES:

1. Easy Cutting – JUVEKAR.
2. Commercial System of Cutting – JUVEKAR.
3. Zarapkar System of Cutting – K.R. ZARAPKAR.
4. Practical Clothing Construction Part I and II – MARY MATHEW.

Semester –V

Skill Based Course

ARTPORT FOILO

UNIT-I

Concept of Portfolio Development – Environment (Natural Factors) , Season, Colour, Culture, Fabric design, Occasion, Presentation Technique.

UNIT-II

Study on Mood board, fabric Board, Theme Board, and Story Board

UNIT-III

Portfolio Presentation of Kid's Wear

Mood board- Colour Paletter- Customet Profile- fabric development Chart- Design Development Chart- Specification Sheet.

UNIT-IV:

Portfolio Presentation of Women's Wear

Mood Board- Colour Paletter- customer Profile- fabric development Chart- Design Development Chart- Specification Sheet.

UNIT-V

Portfolio Presentation of Men's Wear

Mood Board- Colour Palette- customer Profile- fabric development Chart- Design Development Chart- Specification Sheet.

Reference:

1. Judith Miller – The style Source Book, Judith Miller, Tabari and Chang, Newyork 1996.
2. Nirupama Pundir- Fashion Technology Today and tomorrow Mittal Publication , 2007
3. Jenny Devis- A Complete Guide to Fashion designing , Abishek Publications, 2007
4. Tony Hines and Margaret Bruce- Fashion Marketing – contemporary Issues,Buterworth Heinemenn Ltd.,2002
5. Methel Castelino- FashionKaleidoscope, Rupa Publication, 1994
6. Doris Pooser- An Indian Women's Guide to success, AIS International , 2007

Semester –V

Skill Based Course

FASHION PHOTOGRAPHY

UNIT-I

Photography – Basics – General principle- Rules – indoor Photography – Needs and methods lighting techniques for indoor photography – methods and equipment's – advantage and disadvantages – out door photography – methods – lighting techniques – methods and equipments – comparison of outdoor photography with indoor photography.

UNIT II

Camera definition – parts of camera- classification and types of camera – Applications Disadvantages.

UNIT III

Photography techniques and equipment for different fields. Modeling, newspaper, magazines –occasions –Fashion shows.

UNIT IV

Developing – Definition – Different techniques in developing. Printing – definitions – Methods of printing for black & white color.

UNIT V

Photography using digital cameras – Video photography – image mixing – application of computers in photography.

Reference:

1. W.R. Miller, “Basic Industrial Arts, Plastics, Graphics Arts, Power Mechanics, Photography”, McKnight Publishing Company, Illionois, 1978.
2. John Hedge, “Photography Course”, John Hedge Co, 1992.

Semester –V

Major Elective -II

TECHNOLOGY OF TEXTILE FINISHING

UNIT-I

Introduction to finishing – Definition , Importance , Classification.

Mechanical Finishing – Sanforising- calendaring – Brushing – Decating – Milling.

UNIT-II

Chemical finishing - Wash and wear finishing, Anti-crease finish, durable finish, Stiff Finish, Denim Finish, Stone wash finish.

Application of silicones in finishing processes.

UNIT-III

Functional finishes – water proof finishes- water repellent finish – flame retardant finish – soil release finish, antimicrobial finish.

Nano Technology in Textile finishing.

UNIT-IV:

Eco-friendly processing – Definition and importance. Study of conventional processing with eco- friendly processing. Enzymes – characteristics, Types . Application of enzymes in textile processing.

UNIT-V:

Effluent plant – effects from various plants – various process for treating waste water.

Reference:

1. Shenai V.A. “ Technology of Finishing” Sevek Publications, Mumbai (1996)
2. Manivasaga.N. Treatment of Textile Processing Effluents”, Sakti Publications.
3. Bernard .P.Corbman “ Textile Fibre To Fabric” – Mcgraw Hill , 1983.

CARE AND MAINTENANCE OF TEXTILES

UNIT-I

Water- hard and soft water, methods of softening water.

Laundry soaps – Manufacture of soap (Hot process , cold process), composition of soap types of soap, soap less detergents , chemical action , detergent manufacture , advantages of detergents .

UNIT-II

Finishes – Stiffening Agents – Starch (cold water and hot water) , Other stiffening agents, preparation of starch .

Laundry blues , their application .

UNIT-III

Laundry equipment – for storage, for steeping and Washing – Wash board, suction washer, wash boiler, washing machine.

Drying equipments – out door and indoor types .

Irons and ironing board – types of iron (box, flat , automatic, steam iron) . Ironing board – different types.

UNIT-IV

Principles of washing – suction washing, washing by kneading and squeezing , washing by machine - Process details and machine details.

Laundering of different fabrics – cotton and linen, woolens, coloured fabrics, silks, rayon and nylon.

UNIT-V

Special types of Laundry – water proof coats, silk ties, leather goods, furs, plastics, lace.

Dry cleaning – using absorbents , using grease solvents.

Storing – points to be noted.

Stain removal – food stains, lead pencil, lipstick, mildew, nose drops, paint ,perfume, perspiration / mildew, tar, turmeric and kum- kum.

Care labels – washing, bleaching, Drying, ironing and different placements of label in garments.

References;

- 1.Textiles fabrics and their Selection – Wingate I B, Allied publishers Ltd, Chennai.
- 2.Fundamentals of Textiles and their Care- Susheela Dantyagi , Orient Longmann Ltd (1980).
- 3.Family Clothing – Tate of Glession , John Wiley & Sons I n c, Illinois.
- 4.Household Textiles and Laundry Work – Durga Duelpkar , Amla Ram & Sons, Delhi

Semester –VI

Core- XV

TECHNICAL TEXTILES

UNIT-I:

Technical Textiles –Definition and Scope . Categories of Technical Textiles.

UNIT-II:

Medical Textiles – Classification. Fibres used and their properties required.
Medical textile Products - Properties , functions.

UNIT-III:

Geo textiles – Definition, Fibers used in geo textiles – requirement of fibers.
Functions of GeoTextiles – Separation, Filtration, Drainage, Reinforcement.

UNIT-IV:

Textiles for automotive industry. Suitable fibers for automotive industry.
Safety devices – Airbags- Materials used –types of fabric –Seat belts – Types, Fabrics used..

UNIT-V:

Brief study on Protective textiles – Bullet proof fabrics – fire retarding fabrics – high temperature fabrics –High visibility clothing . Fibres used and Properties of fabrics.

Reference:

1. The design of Textiles for Industrial Application – P.W.Harrison
2. Protective Clothing – Bajaj .P. and Sengupta A.K.
3. Textiles: Fiber to fabric – Corbman .B.P.
4. Performance of Protective Clothing – Johnson.J.S. and Mansdork. S.Z.

Semester –VI

Core –XVI

QUALITY CONTROL IN APPAREL PRODUCTION

UNIT-I:

Statistical quality control:

Quality definition – Quality and its importance- Meaning of Quality control –SQC- Control Charts. Sampling- Importance and types of sampling techniques.

UNIT-II:

Standards for quality

Established Merchandising Standards- Standards for Quality – ISO implementation Procedure- ISO 9000 and ISO 14000 – six sigma

UNIT-III:

Quality systems:

Total Quality Management – Objective and Phases of TQM , Quality Circle- AQL – Accepted Quality Level.

UNIT-IV:

Production Control:

Types of Control forms- Basic Production systems, flow process grids for production – Control Scheduling Calculation – types of Schedule.

UNIT-V:

QUALITY CONTROL IN APPAREL INDUSTRY

Quality control in designing , pattern making. Warehousing . Quality Control Trims, Fasteners, Sewing thread , Needle and Accessories. Inspection- stages and systems of inspection.

Reference:

1. Pradip V. Metha , Introduction to quality control for Apparel Industry ASQC Quality Press, Marcel Dekker, Inc. 1992
2. Chuter A.J. Introduction to clothing Production Management , Blackwell Publishing House, 1995
3. Pradip V. Metha, Managing Quality in the Apparel industry, Satish K. Bharadwaj, New age International (P) Ltd., Publishers, 2006.
4. Ruth E. Glock Grece I Kunz, Apparel Manufacturing and Sewn Product Analysis, 2005.
5. Anita A Stephen Sue Hamphrice Sharp , Linde B Donnel , Evaluation Apparel Quality , Fair Child Fashion Group , New group.
7. Sara J. Kadolph, Quality Assurance for textiles and Apparel , Fair Child Publications, Newyork.

Semester VI

Core- XVII

ENTREPRENEURIAL DEVELOPMENT

Unit I :

Concept of Entrepreneurship: Definition Nature and Characteristics of Entrepreneurship - Functions and types of Entrepreneurship phases of EDP. Development of women Entrepreneur and rural Entrepreneur – including self employment of women council scheme.

Unit II:

The Start – up process, Project Identification – Selection of the product – Project formulation evaluation – Feasibility Analysis, Project Report.

Unit III:

Institutional service to Entrepreneur – DIC, SIDO, NSIC, SISI, SSIC, SIDCO, ITCOT, IIC, KUIC and commercial Bank.

Unit IV:

Institutional finance to Entrepreneur – IFCI, SFC, IDBI, ICICI, TIIC, SIDCS, LIC and GIC, UTI, SIPCOT – SIDBI and commercial Bank venture capitals.

Unit V:

Incentives and subsidies – Subsidised Services – Subsidy for market. Transport – seed capital assistance – Taxation benefit to SSI – role of Entrepreneur in export promotion and import substitution.

BOOKS FOR REFERENCE:

1. Entrepreneurial Development – C.B. Gupta and N.P. Srinivasan
2. Fundamentals of Entrepreneurship and small Business – Renu Arora and S.KI.Sood
3. Entrepreneurial Development – S.S.Khanka
4. Entrepreneurial Development – P.SaravanaVel
5. Entrepreneurial Development – S.G.Bhanushali
6. Entrepreneurial Development – Dr.N. Ramu

Semester VI

Core XVIII

DRAPING TECHNOLOGY

UNIT-I:

Definition of draping – draping tools and equipments – draping principles. Preparation of muslin for draping – Seam allowance –Preparation of Dress form for Draping. Draping of basic Bodice front- Preparation of Muslin – Draping Steps – Marking – Trueing- draping of Basic Bodice Back- Draping of basic sleeves – Draping of Basic Skirt.

UNIT-II

Front Bodice with under ar dart- Back bodice with Neckline Dart- dart manipulation – waist line dart- dart at waistline and centre front – French Dart- double French Dart- Double French Dart- flange Dart- Neckline Dart- Bust line Dart at centre front- Armhole Dart. Pleats- darts- tucks- gathers – neckline variations- Front and back Armhole variations-Typical sleeveless – Squared – Cutaway.

Waistline Variation- lowered-Empire- shortened- scalloped-pointed . The Princess Bodice- Cowls- Yoke- Front – back- Square Cowl- under arm cowl- Wrapped Neckline , Cowl Twists- butterfly Twist – Two piece Bins twist Neck yoke twist- bust twist.

UNIT-III**Draping of skirts and slacks**

Draping of one piece basic skirt- Gored skirt- Flared Skirt-Pleats in the Flared skirt- gathers in the Flared Skirt- Pleated skirt- Side and Box pleated Skirt- Kick pleated and inverted pleated Skirt

Draping of basic straight slacks- Fitted slacks- Tapered slacks-Pegged slacks- Divided skirts.

UNIT-IV:**Draping of Yokes , sleeves and collars**

Draping of fitted yoke- Bodice yoke- Shirt yoke –Hip yoke . Draping o Mandarin Collar- bank collar- Convertible collar- Peterpan collar . Draping of basic Dolman Sleeve- Long Fitted Dolman sleeve- semi mounted Sleeve- Raglan Sleeve- Kimono sleeve with gusset.

UNIT-V:

Draping of knit garments

Draping of bias- cut slip dress- Bustier Designs- Basic knit bodice dress- knit Halter- Knit Leotard- Knit Panties.

Draping of Flounces- circular flounce- Shirred flounce- Draping of Ruffles- Variable ruffle finishes- draping of peplums. Draping of 'A' line shift- Draping of Princess dress- Draping of Basic Jacket.

Reference:

1. Draping for fashion Design – Hilde Jaffe, Nurie Relis, Pearson Education 2012
2. Draping for Apparel design – Hellen Joseph.
3. The Art of fashion Draping – Fairchild Books.

Semester VI

Core Practical - XIX

TEXTILE TESTING AND CARE

Fibre Testing

- Longitudinal view test using Microscope
- Fibre Length using Baer Sorter
- Fineness test using Sheffield Micronaire
- Bundle Strength using Stelometer

Yarn Testing

- Yarn Count using Wrap Reel and Electronic Balance
- Yarn Count Beesley Balance and Quadrant Balance
- Yarn Twist using Twist tester
- Yarn Strength using Lea Strength Tester

Fabric Testing

- Fabric length and Width
- Fabric thickness
- Fabric Weight
- Bursting Strength
- Crease Recovery
- Stiffness
- Drape
- Fabric warp and weft Crimp
- Rubbing fastness
- Washing fastness
- Perspiration Fastness
- Light Fastness

Clothing care

- Preparation of Soap by Hot and Cold Process
- Preparation of Detergent
- Starch preparation by Hot and Cold Process
- Blue Preparation
- Stain removal

APPENDIX – AZ62

Manonmaniam Sundaranar University, Tirunelveli – 627 012

**B.Sc Fashion Designing and Apparel Making
(Effective from the Academic year 2012 – 2013)**

SCHEME OF EXAMINATION – CBCS PATTERN

Semester III

Components	Hours	Credit	Total			
			CIA	Uni. Exam	Total Marks	Exam Hours
Part III (2T + 1P)						
<i>Core Subjects</i>						
Core V – Woven and Fabric Structure	6	4	25	75	100	3
Core VI – Designing and Construction of women’s wear – (Practical)	6	4	40	60	100	3
Core VII – Fashion Illustration	6	4	25	75	100	3
<i>Skill based Subject</i> (1 Course)						
1. Embroidery and Surface working 2. Costume Development	4	4	25	75	100	3
<i>Non Major Elective</i> (1 course)						
1. Fashion Concept 2. Embroidery and Surface Working	2	2	25	75	100	3
<i>Allied – IV</i> (1Course)						
Textile Chemistry I –Theory	4	2	25	75	100	3
Textile Chemistry I – Practical	2	2	40	60	100	3
Total - 7 Courses	30	23				

Semester IV

Components	Hours	Credit	Total			
			CIA	Uni. Exam	Total Marks	Exam Hours
Part III (1T + 1P) <u>Core Subjects</u>						
Core VIII – Knit Fabric and Structure	6	4	25	75	100	3
Core IX – Office Automation and CAD - Practical	6	4	40	60	100	3
<i>Skill based Subject</i> (1 Course)						
1. Creative art and Textile Furnishing	4	4	25	75	100	3
<i>Non Major Elective</i> (1 course)						
1. Fashion Illustration	2	2	25	75	100	3
2. Fibre to Fashion						
<i>Major Elective (1Course)</i>						
Fashion Merchandising and Marketing	6	5	25	75	100	3
<i>Allied V (2 Courses)</i>						
Textile Chemistry II – Theory	4	2	25	75	100	3
Textile Chemistry II – Practical	2	2	40	60	100	3
Total - 8 Courses	30	24				

Practical :

1. Designing and Construction women's wear
2. Office Automation and CAD
3. Textile Chemistry

* The above practicals will be conducted in the IV Semester

Semester V

Components	Hours	Credit	Total			
			CIA	Uni. Exam	Total Marks	Exam Hours
Part III (3T + 1P)						
<u>Core Subjects</u>						
Core X – Textile Testing and Quality Control	4	4	25	75	100	3
Core XI – Home Textiles	4	4	25	75	100	3
Core XII – Fashion and Clothing Psychology	4	4	25	75	100	3
Core XIII- Designing and Constructing Men’s wear – Practical	8	4	40	60	100	3
Major Elective						
Technical Textiles	6	5	25	75	100	3
Skilled Based Subject						
1. Communication skills	4	4	25	75	100	3
2. Personality Development						
Total (6 course)	30	25				

Semester VI

Components	Hours	Credit	Total			
			CIA	Uni. Exam	Total Marks	Exam Hours
Part III						
<u>Core Subjects</u>						
Core XIV – Apparel Costing	4	4	25	75	100	3
Core XV – Apparel Export trade Documentation	4	4	25	75	100	3
Core XVI – Clothing care and Wardrobe planning	4	4	25	75	100	3
Core XVII – Apparel productions and Quality Management	4	4	25	75	100	3
Core XVIII – Fashion port Folio – Practical	8	4	40	60	100	3
Project	6	5	40	60	100	
Total	30	25				

Practical :

- 1. Designing and Constructing Men's wear**
- 2. Fashion port Folio**

*** The above practicals will be conducted in the VI Semester**

CORE - V

Woven Fabric and Structure

UNIT-I

Introduction to weaving – looms and their classifications.

Fabric forming process sequences – preparatory processing required for woven fabric production- winding, warping and sizing methods and machines.

UNIT-II

Passage of material through a power loom- important parts of loom and its function-Primary and secondary motions.

Types and Function of Dobby and Jacquard mechanism.

UNIT-III

Principles of shuttleless looms- Projectile, Air Jet, Water Jet, Rapier .

UNIT-IV

Elements of woven design – classification of weaves. Construction of elementary weaves- Plain weave and its derivatives. Twill weave and its derivatives. Honey comb, satin and sateen weave. Huck-a-back and crepe weave.

Bedford cord and its modifications. welt and piques and its modifications. Mock-leno weave.

UNIT-V

Extra warp and weft figuring – Backed fabrics – Pile fabrics – Double cloth and its types.

Reference:

- 1 Weaving mechanism – N.N.Banerjee.**
- 2 Fabric forming – Hasmukari.**
- 3 Watsons Textile design and Colour – Grosick I.J.**

CORE – VI

**Designing and Construction of Women's wear
(Practical)**

1. SIX GORE SAREE PETTICOAT

Feature:

- a) Six panel
- b) Frilled edge

2.FOUR GORE SAREE PETTICOAT

Features:

- a) Four panel
- b) Frilled edge

3.BLOUSE:

Features:

- a) front open
- b) Fashion neck
- c) Waist band
- d) Any sleeve

4.KATORI CHOLI

features:

- a) Kato
- b) Waist band
- c) Belt.

5.MIDDI

Features:

- a)With (or) without open
- b)Waist band of elastic
- c)Panel

6. MIDDITOP

Features:

- a)Back (or) Front open
- b) Collar
- c) Fashioned full sleeve with or without cuff.

7.MAXI

Features:

- a) Back open
- b) Trimming in front
- c) Fashioned neck
- d) Fashioned sleeve

8. NIGHTY

Features:

- a) Yoke
- b) Bell sleeve
- c) Gathered bottom
- d) Attaching trimmings.

9. SALWAR

Features:

- a) Tape or Elastic attached waist
- b) Designed bottom.

10. KURTA

Feature:

- a) Fashioned neck
- b) Fashioned sleeve
- c) Side seam slit.

11. LADIES PANT

Features:

- a) Waist band
- b) Zip attached
- c) Patch pocket

12. LAIDES SHIRT

Features:

- a) Half or Full open
- b) Collar
- c) Half or Full Sleeve

13. SALWAR

Features

- a) Gathered waist with tape or elastic
- b) Bottom design

14. KAMEEZ

Features:

- a) Fashioned front body
- b) Back or Front open
- c) Fashioned neck
- d) Fashioned sleeve.

Reference

1. Practical Clothing Construction Part-I & II – Mary Mathew
2. Zarpakar System of Cutting - K.R.Zarpakar
3. Easy Cutting – Juvekar
4. Commercial system of cutting – Juvekar
5. Dress making – Smt. Thangam Subramaniam

CORE - VII

Fashion Illustration

UNIT – I

Human anatomy – study of human anatomy in terms of shapes, sizes and movements. Drawing hairstyles on the croquis – Drawing various fashionable hair styles on the croquis

UNIT – II

Drawing the face of the croquis – Drawing the face of a fashion figure – proportion and placement of facial feature, each feature to be dealt separately and faces to be analysed into croquis face.

UNIT – III

Drawing different hand and leg poses on the croquis – Analysing into croquis hands and croquis legs.

Drawing accessories on the croquis – Analysing the different types of accessories and drawing them on the croquis.

UNIT – IV

Drawing sleeve and cuffs on croquis – Drawing different types of collar and their fall in the neckline

Bodice variations, yokes panels and other details – Different types of bodice variations and yokes.

UNIT – V

- a. **Drawing a fleshy figure – Drawing a fleshy figure from a stick figure. Dividing the figure into various parts using lines like plumb line, centre front line, princess line, waist line, side seam, arm holes, jewel neckline, panty line, bust line etc.,**
- b. **Designing a range of fashion garments – The fashion garments will be designed incorporating the surfaces developed.**

Reference

1. **Advance Fashion Sketch Book by Bina abling – OM Books International**
2. **Fashion Drawing the Basic principles by Anne allen and Julian seaman – OM Books International**
3. **Design studies by Manmeet Sodhia – Kalyani publishers**
4. **History of fashion by Manmeet Sodhia – Kalyani publishers**
5. **Textiles and Fashion by V.L. Mote – Tata Me Graw Hill.**
6. **Advance Fashion Sketch Book by Bina abling – OM Books International**
7. **Fashion Drawing the Basic principles by Anne allen and Julian seaman – OM Books International**
8. **Design studies by Manmeet Sodhia – Kalyani publishers**
9. **History of fashion by Manmeet Sodhia – Kalyani publishers**
10. **Textiles and Fashion by V.L. Mote – Tata Me Graw Hill.**

Skill Based Subject (III Semester)

1. Embroidery and Surface Working

UNIT-I

Hand embroidery

Running stitch, back stitch, stem stitch, blanket stitch, lazy daisy stitch, chain stitch, herring bone stitch, fish bone, seed stitch, and cross stitch

UNIT-II

Feather-single and double, romanian stitch, fly stitch, long and short stitch, French knot, bullion knot, double knot, satin stitch, and couching.

UNIT-III

Machine embroidery

Running stitch, cording stitch, satin stitch, long and short, round stitch, and eyelet work,

UNIT-IV

Traditional Indian embroidery

Kashida of Kashmir, kantha of Bengal, phulkari of punjab, embroidery of kutch and kathiawar, kasuti of Karnataka, chikankari of lucknow

UNIT-V

Creating style through surface trimming

Cut work, bead work, sequence work, mirror work, patch work, appliqué work, quilting, fabric painting, drawn thread work, faggoting ,smocking.

Reference :

- 1. Practical clothing construction part I &II –Mary Matthew**
- 2. Indian Embroidery – Kamala devi**
- 3. Creative art of embroidery – Barbara snook**

Skill Based Subject (III Semester)
2. Costume Development

UNIT – I

Evolution of clothing – Introduction to Textile beginning of dress.

UNIT – II

Development of Costumes in ancient India – Indian Textile Development – Khadi, Handloom, Power loom.

UNIT – III

Traditional Woven Textiles of India and traditional dyes textiles of India : Dacc Muslin – Jamdani – Chanderi – Brocades – Balucher and Kashmir Shawls – Bandhani – Patola Ikkat – Techniques of dyeing adopted.

UNIT – IV

**Traditional Printed Textile of India
Traditional Printed Textile of India, Kalamkari and fabric painted materials block printed fabrics of India**

UNIT – V

Embroideries of India

Phylkari, Chikankari, Kantha, Kutch, Kathiawar and sind embroidery, Kasuti – Kashmir (Kashida) – Chamba- Roomal.

Reference:

- 1. Costumes of India and Pakistan – S.N.Das**
- 2. Costumes and Textiles of India – Jamila Brij Bhushan**
- 3. Costume of India – Dorris Flyn**
- 4. Historic costume – Lesla K.T.**

Non Major Elective (III Semester)

1. Fashion Concept

UNIT – I

Fashion – Style – Fad Definition – Sources of Fashion – Terms related to Fashion Industry – Boutique, Collection, Classic Chic Fashion Shows, Fashion Trends and High Fashion.

UNIT – II

Role of designer – Researching the market. Design process, sample production. Sources of design inspiration. Types of designer – High fashion designer, Moderate designer, Stylist and freelance designer.

UNIT – III

Colour – definition characters of colour, theory, colour schemes, colour psychology, visual and physical effect of colour, colour & texture, colour marketing systems. Value & intensity of colour.

UNIT – IV

Design and Principles of design, Definition, types of design – structural and decorative design, characteristics of a good design, elements of design –principles of design – Definition – Harmony – Proportion –Scale, balance – Rhythm – Emphasis – and its application in dresses.

UNIT – V

Components of fashion – Silhouette, Texture, colour, Acceptance change. Environment of fashion – Economic factors, sociological factors, Physical factors Psychological factors. Movement of fashion – Cycling of fashion, Stages of fashion cycle.

REFERENCES

- 1. Goldstein and Goldstein. Art in Everyday life. Mac Millan and co. New York**
- 2. Mathews M. Practical clothing construction. Part-III cosmic Press, Madras.**
- 3. Markstorm, Dorthy and Jane. Guide to Modrden clothings, MC, Graw Hill Boom Company, New York.**

Non Major Elective (III Semester)
2. Embroidery and Surface Working

UNIT-I

Hand embroidery

Running stitch, back stitch, stem stitch, blanket stitch, lazy daisy stitch, chain stitch, herring bone stitch, fish bone, seed stitch and cross stitch

UNIT-II

Feather-single and double, romanian stitch, fly stitch, long and short stitch, French knot, bullion knot, double knot, satin stitch and couching.

UNIT-III

Machine embroidery

Running stitch, cording stitch, satin stitch, long and short, round stitch and eyelet work,

UNIT-IV

Traditional Indian embroidery

Kashida of Kashmir, kantha of Bengal, phulkari of punjab, embroidery of kutch and kathiawar, kasuti of Karnataka, chikankari of lucknow

UNIT-V

Creating style through surface trimming

Cut work, bead work, sequence work, mirror work, patch work, appliqué work, quilting, fabric painting, drawn thread work, faggoting and smocking.

Reference :

- 1. Practical clothing construction part I & II – Mary Matthew**
- 2. Indian Embroidery – Kamala devi**
- 3. Creative art of embroidery – Barbara snook**

Allied -IV

Textile Chemistry- I

UNIT- I

Types of Water- Hard and soft water. Hardness of water - Temporary and permanent hardness. Problems caused by hard water. Methods of softening water. Care and labeling.

UNIT-II

Soaps and Detergents

Definition, Manufacture, Properties and their cleansing action, Indigenous cleaning agents like Rita nut, Shikkakai and Bran.

UNIT-III

Stiffening agents-Natural and commercial starches. Bleaching agents, Bluing agents. Optical brighteners. Additional laundering agents-Acidic, Alkaline and Others. Stain Removal.

UNIT-IV

a. Methods of washing-Wet cleaning, Dry cleaning.

Wet Cleaning:

- 1) Application of friction-Hand friction, Rubbing, Scrubbing.**
- 2) Application of light pressure- Kneading, Squeezing.**
- 3) Suction washing.**
- 4) Washing by machine.**

Dry Cleaning:

Methods - Damping, Ironing.

b. Finishes: Definition, singeing, desizing, scouring, bleaching, and their types. Mercerization – Theory process, and methods

UNIT – V

Dyeing – Definition, rules for dye stuff, classification – water soluble dyes – direct, acid, base and reactive. Water insoluble dyes – Vat, sulphur and suitable for different fibers – Cotton, Viscose rayon, Silk, Wool, and Polyester.

REFERENCES:

- 1. Household Textiles and Laundry Work – DURGA DELUKAR.**
- 2. Fundamentals of Textiles and Their Care – DANTYAGI.S.**
- 3. Shenai V.A. “Technology of Textile Processing” Vol III, V, VII & VIII – Sevl publication Mumbai 1981.**
- 4. Lewis D.N. “Wool Dyeing” SDC Publ. England 1990**
- 5. Beginner’s Guide to fabric dyeing and printing – by Shirt & Rabirison. P. Ecnical Books, London 1982.**
- 6. Hand Book of Textiles by P.V.Vidyasagar.**

CORE - VIII
Knit Fabric and Structure

UNIT – I

Knitting – Definition. Differentiate weaving and knitting. Classification of knitting. Comparison of warp and weft knitting. Basic knitting elements.

UNIT-II

Weft knitting –Definition .Yarn passage diagram of a circular knitting machine-knitting elements and mechanism.

Rib, interlock, purl structure. Ornamentation – derivatives. Pique - Variations. Major types of yarns for weft knitting, Defects in weft knitted fabrics.

UNIT-III

Circular rib knitted machine – Elements and functions.

Interlock knitting machine – Elements and functions.

Non-apparel use of knit goods.

UNIT-IV

Jacquard knitting- Needle selection for jacquard and non-jacquard Pattern making –Pattern wheel , pattern drum, programmed tape.

Calculations – Methods of finding courses per inch, wales per inch and loop length- GSM calculation- count and gauge relationship- efficiency calculation – tightness factor- Production in length and weight units.

UNIT-V

Warp knitting – Definition – knitting machines – Variations in warp knitting- Tricot – Variations in guide bars- Knitting cycle. Rachel – variation in guide bars – Knitting cycle. Differentiate Tricot from Rachel. Yarns for warp knitting – common faults in fabrics.

Reference

- 1. Knitting Technology – D.B. Ajgaonkar**
- 2. Knitting Technology – David .J.Spencer**
- 3. Textile Mathematics- J.E.Booth**
- 4. Kitting Tech – Dr. ANbumani. N**
- 5. Warp Kniting – Raz**

CORE - IX
Office Automation and CAD - Practical

UNIT-I

Introduction to MS office – creating a word document – creating Excel worksheet – creating PowerPoint presentation.

UNIT-II

Introduction to computer networking – Internet – Internet browsers - Internet explorer, Netscape navigator, Internet tolls, E-mail. HTML

UNIT-III

Coral draw and Pagemaker

UNIT-IV

Adobe, Adobe illustration, Adobe photo shop

UNIT-V

Flash

Reference

1. Computer in the fashion technology – Partic Taylor
2. CAD in clothing and Textiles – Winfred Aldrich.
3. Teach yourself Microsoft office in 24 hours – Grag Perry
4. Computer Programming and Applications – R.Krish
5. Computer in the fashion technology – Partic Taylor
6. CAD in clothing and Textiles – Winfred Aldrich.
7. Teach yourself Microsoft office in 24 hours – Grag Perry
8. Computer Programming and Applications – R.Krishnamoorthy

Skilled Based Subject
Creative art and Textile Furnishing

UNIT – I

Art - Meaning, functions, forms of creation, principles of art.
Preparation of creative art – Paper , Puppets, basket

UNIT – II

a. Creative arts from waste – Rugs, Patch work, braid, lampshade, quilt mat, pen stand, decorative pots.

b. Preparation a file cover, bag and book binding.

UNIT – III

Define furnishing – Different types of furnishing for Living room – sofa covers, wall hangers, cushion, cushion covers, Upholsteries, Bolster and Bolster covers.

UNIT – IV

Bed Linens – Definition, Different types of bed linens, sheets, blanket covers, comfort covers, bed spreads, mattress and mattress covers and pads, pillows and pillow covers, Use and Care.

UNIT – V

Kitchen and Table Linens – Definition, Types of Kitchen linens, Table cloth, Table cover, Mat and types. Dish cloth, Hand towels, Fridge cover, Fridge handles, Mixi cover, Grinder cover, their Use and Care.

Reference

1. **Soft Furnishing – MAC DONAID.**
2. **Designing Interior Environment – ALEXANDER N.G.**
3. **Interior Decoration in India – DONSERKERY K.G.**
4. **The House Style Book – DEYAN SUDJIC.**
5. **House Hold Manual – ELIZABETH GUNDREY.**

Non Major Elective (IV Semester)

1. Fashion Illustration

UNIT-I

Human anatomy-study of human anatomy in terms of shapes, sizes and movements.

UNIT-II

Drawing a flesh figure –drawing a fleshy figure from a stick figure. Dividing the figure into various parts using lines like plumb line, centre front line, princess line, waist line, side seam, arm hole, jewel neckline,pantylene,bust line etc.

UNIT-III

Drawing the face of the croquic- drawing the face of a fashion figure proportion and placement of facial features, each feature to be dealt separately and faces to be analyzed into croquic face.

UNIT-IV

Drawing hairstyles and accessories on the croquis. drawing various fashionable hair styles and accessories on the croquis.

Unit-V

Women's project

Create a mood board-color palette- customer profile-illustration-specification sheet.

REFERENCE:

- 1. The style source book- Judith miller, Stewart, tabori and chang. New york**
- 2. Fashion drawing the basic principles by Anne Allen and Julian seaman**
- 3. Design studied by Manmeet sodhia – Kalyani publishers.**

Non Major Elective (IV Semester)

2. Fibre to Fashion

UNIT-I

Textile fiber – Definition – Properties of textile fiber – classification of fiber. Brief study and important properties of cotton, silk, wool rayon and polyester best fibers – Influences of fiber properties on fabric characteristics

UNIT-II

Yarn definition, Classification, types

UNIT-III

Weave – definition, Classification. Study on basic weaves.

UNIT-IV

Fashion – Style – Fad Definition – Sources of Fashion – Terms related to Fashion Industry – Boutique, Collection, Classic Chic Fashion Shows, Fashion Trends and High Fashion.

UNIT-V

Role of designer – Researching the market. Design process, sample production. Sources of design inspiration. Types of designer – High fashion designer, Moderate designer, Stylist and freelance designer.

Major Elective
Fashion Merchandising and Marketing

UNIT-I

Merchandising – Definition, types . Fashion merchandising – principles and techniques. Merchandiser – role and function.

UNIT-II

Visual merchandising technique – Merchandising Ladder – Factors for Route card – Preparation – Effective Expediting procedures – samples and types of samples, Brand – Definition. Branding strategies.

UNIT-III

Apparel Merchandising – principles and techniques. Apparel Merchandising – Interface with production.

UNIT-IV

Marketing – definition – nature and scope. Classification of marketing functions – Buying, Assembling, Standardization and Grading, Packing and Packaging, Storage, Advertising, selling, Buying motives, Consumer decision making.

Production planning and development, product line policies and strategies, production mix, factors influencing changes in product mix.

UNIT-V

Advertising – types – preparation of advertising for apparels. Advertising media used in apparel marketing. Advertising department and advertising agencies.

Reference

1. Path for merchandising – a step by step approach – Moore Evelyn.C.
2. Inside the Fashion Business – J. Arnou and K.G. Dickerson
3. Fashion Merchandising – Laine stone, Jean A Semples .
4. Marketing Management – Dr. B.K. Chatterjee Jaaico, Juice Publishing House, Bombay, 1982
5. Marketing – Principles and method – Philip C.F. and Duncon D.T, Irwin publications.
6. Principles of Marketing – Backman. T.N., Mayard H.K. and Davidson. W.R. Ronald Press Company, New York 1970.
7. Visual Merchandising

Allied - V
Textile chemistry – II

UNIT – I

Introduction to printing – definition, Difference between printing and dyeing –preparation of cloth for printing – cotton, wool, silk, viscose rayon, and polyester. Preparation of printing paste – essential ingredients used in printing paste – various thickening agents and it's preparation.

UNIT – II

Methods of printing – definition, classification – direct, discharge and resist styles, conversion style and crimp style. Foam printing, flock printing, Kalamkari printing, Bubble printing and multi colour printing. After treatments for printed goods.

UNIT – III

Printing – Types of Machine for printing, preparation of screen, table and squeezes used for screen-printing. Automatic screen printing, roller printing-faults and it's rectification, Rotary printing and transfer printing. Advantages and disadvantages of various methods of printing.

UNIT – IV

Stencil printing – preparation of stencils and different stencil techniques used in printing.

Block printing – Preparation of hand blocks and application of block on apparel

Tie and Dye techniques – types of tie and dye techniques.

Batik printing – Learning the art of batik printing.

UNIT – V

Finishing – Temporary, permanent and various types of fibre merchandising.

Reference

2. Beginners Guide to fabric Dying and printing – By Shirat and Rabirision. P. Technical Books, London, 1982.
3. Technology of Textile Printing, Prayag. R.S., L.R. Prayag Dhaund, 1985
4. The Thames & Huddson manual of Textile Printing, story, Joyce Thomas and Hudson, London, 1992.
5. Thickening agents and Thickenings of Textile printing (part 1,2) Herbret, New Delhi Market 1994.

PRACTICALS

Designing and Construction of Women's wear

CONSTRUCT THE FOLLOWING GARMENTS

1. Saree petticoat
2. Blouse
3. Middi
4. Middi top
5. Maxi

6. Nighty
7. Kurtha
8. Salwar
9. Kameez
10. Ladies pant
11. Ladies shirt

Computer Aided Designing

- Transfer a design from sample to computer and vice versa
- Various colour scheme

Computer aided garments for

- Children
- Ladies
- Men's

Computer control of

- Pattern making
- Pattern Grading
- Label Designing
- Computer Colour Matching
- Word, excel, power point
- E.mail – browsing, HTML tags

Textile Chemistry

Identify and prepare the following

- a. Preparation of soaps and detergents
Preparation of natural and commercial starches
Application of stain removal methods on fabrics
Learning the following types of printing, dyeing and preparing samples
- b. Dyeing - Direct, disperse, acid, reactive.
Finishes – bleaching and scouring
- c. Printing : Block print, Screen or stencil print, Tie and Dye, Batik

Core X

Textile Testing and Quality Control

UNIT – I

Introduction to Textile Testing and Quality Control – Definition, Importance of Textile testing and quality control, Routine tests performed in Textile Industry.

UNIT – II

FIBRE ANALYSIS: Identification of Textile Fibre – Burning, Solvent, Longitudinal and Cross sectional view of Cotton, Wool, Polyester, Nylon, Acrylic fibres. Cotton fibre length, strength, Fibre fineness.

UNIT – III

YARN ANALYSIS: Yarn numbering, wales, courses, density, evenness Yarn strength, Twist and crimp. Colour fastness tests in Textiles – Crocking, Perspiration, Sunlight, Laundering.

UNIT – IV

FABRIC ANALYSIS: Length, Width, Bow, Skewness, Weight, Thickness, Breaking Strength, Abrasion Resistance, Crease Recovery, Stiffness of fabrics and drapability.

UNIT – V

Additional test for fibres and Yarn –Microscope, Weight method, Air flow method, Wet strength and elongation of filament yarn, Knot strength, Loop strength for filament yarn, Crimp.

Reference

- 1. Principles of Textile Testing – BOOTH J.E.**
- 2. Technology of Textile Properties –MANJORCE. A.TAYLOR.**
- 3. Textile Testing and Quality Control – GROUER AND HAMBY.**
- 4. Textile Testing and Quality Control – ANGAPPAN.**

Core XI Home Textiles

UNIT – I

INTRODUCTION TO HOME TEXTILES

Definition, Different types of home textiles – Woven and Non – Woven. Factors affecting selection of home textiles. Recent Trends in Home textiles.

UNIT – II

Floor coverings – Hard floor coverings, Resilient floor coverings. Soft floor coverings – Rugs and Carpets, Use and Care.

UNIT – III

Wall covering – Definition, Different Types, Use and Care.

UNIT – IV

Doors and Windows – Definition, Different types of Doors and Window, their application.

UNIT – V

Home Decoration- Draperies – Choice of fabrics, calculating the amount of material needed, hints on making curtains, wall hang, Methods of finishing draperies at the top. Use of drapery rods, hooks, tape rings and pins.

Reference

- 1. Soft Furnishing – MAC DONAID.**
- 2. Designing Interior Environment – ALEXANDER N.G.**
- 3. Interior Decoration in India – DONSERKERY K.G.**
- 4. The House Style Book – DEYAN SUDJIC.**
- 5. House Hold Manual – ELIZABETH GUNDREY.**

Core XII

Fashion and Clothing Psychology

UNIT – I

Fashion Accessories – Shoes, handbags, jewelry, hats, ties and others. Prepare an album for accessories.

UNIT– II

Figure irregularities – stout figure, thin figure, slender figure, narrow shoulders, broad shoulders, round shoulders, large bust, flat chest, large hip, large abdomen, round face, large face, small face and broad face, prominent chin and jaw and prominent forehead.

UNIT– III

Factors affecting fashion changes – Psychological needs of fashion, Psychology of fashion, Technology, Economical, Political, legal and seasonal.

UNIT – IV

Recurring silhouettes – changes in silhouettes; fashion cycle; Prediction fashion; Role of costumes as status symbol, clothes as sex appeal, self identity, cultural value.

UNIT– V

Understanding Fashion Designer: Designer types – classicist, idealist, Influenced, Realist, Thinking poet.

Reference

- 1. Benneett “Femina Book of Fashion”, Coleman & Co., Ltd., Mumbai (1998)**
- 2. Jeaneettee. A. Jarnow, Miriarn Guerrerio, “Inside the Fashion Business”, Mecomillion PublishingCompany New York 1987.**
- 3. HarrietT. Mcjimesey, “Art and Fashion in clothing selection”, The Iowa state University Press, Ames, Iowa 1973.**

Core XIII
Designing and Constructing Men's wear
Practical

UNIT – I

Designing and drafting of shirts

1. **Slack Shirt : Features**
 - (A) **Open Collar**
 - (B) **Patch Pocket**

2. **T – Shirt : Features**
 - (A) **Front Half open – Zip Attached**

3. **Full Sleeve : Feature**
 - (A) **Open Collar**
 - (B) **Patch Packet**
 - (C) **Full Sleeve with cuff**

UNIT – II

1. **Pleated Trousers : Features**
 - (A) **Pleats in Front**
 - (B) **Darts At Back**
 - (C) **Side Pockets**
 - (D) **Fly with Buttons or Zip**
 - (E) **Belt with Adjustable strap.**

2. **Bell Bottom : Features**
 - (A) **Bell Bottom**

3. **Narrow Bottom : Features**
 - (A) **Narrow Bottom**
 - (B) **Pleats**
 - (C) **Hip Pockets**

UNIT – III

Designing and Drafting Kurates

1. **Kalidar – Kurta : Features**
 - (A) **Kalipiece**
 - (B) **Side Pocket**
 - (C) **Stand Collar**
 - (D) **Half Open**

2. **Nehru Kurta : Features**
 - (A) **Half Open**
 - (B) **Round Neck**

- (C) With or without Pocket
- (D) Full Sleeve

UNIT – IV

Designing and Drafting Jeans and Pyjama

1. Jeans : Features

- (A) *Tight Fitting*
- (B) Jeans Cut
- (C) Pockets

2. Pajamas : Features

- (A) Elastic or Tape Attached Waist
- (B) Fly

UNIT – V

Designing and Drafting Single Breast coat and Night Dress

1. Single Breast Coat : Features

- (A) Coat Collar
- (B) Coat Sleeves
- (C) Pocket

2. Night Dress : Features

- (A) Round Neck or Collar Attached
- (B) Overlap Front
- (C) Tap Attached

Reference:

1. Scientific Grament Quality “by K. M. Hedge & Sons Plot No. 43, Somuwar pet, Poona – 411011.
2. “Easy Cutting” By Juvkar Commercial Tailors Corporation Pvt. Ltd., 166, Dr. Ambedkar Road, Dardar.
3. “Commercial System of Cutting” By Juvkar Commercial Tailors Corporation Pvt. Ltd., 166, Dr. Ambedkar Road, Dardar.
4. “Zerapkar System of Cutting by K. R. Zreapkar navneet Pub Ltd. Mumbai / Ahmedabad /Nagpur.
5. “Dress Making” by Smt Thangam Subramaniam, Bombay Tailoring & Embroidery college, 32, North Part St, Ambatur, Chennai.
6. “Practical Clothing Construction Part I and II by Mary Mathews Thompson & Co. Pvt Ltd., Chennai – 600 001.

Major Elective **Technical Textiles**

UNIT-I

**Technical Textiles – introduction.
Selection of Fibers – suitability and Property of High performance fibers.**

UNIT-II

**Medical Textiles – Textiles used in various branches of medicals – Bio textiles –
Surgical textiles.
Fibers used in medical textiles – requirement of fibers in medical textiles.**

UNIT-III

**Geo textiles – Fibers used in geo textiles – requirement of fibers.
Application of textiles in geo field.**

UNIT-IV

**Textiles for automotive industry. Suitable fibers for automotive industry.
Safety devices – Airbags- Materials used –types of fabric – Finishing process. Seat
belts.**

UNIT-V

**Protective textiles – Bullet proof fabrics – fire retarding fabrics – high temperature
fabrics – UV protective fabrics.**

Reference:

- 1. The design of Textiles for Industrial Application – P. W. Harrison**
- 2. Protective Clothing – Bajaj .P. and Sengupta A.K.**
- 3. Textiles: Fiber to fabric – Corbman. B. P.**
- 4. Performance of Protective Clothing – Johnson. J.S. and Mansdork. S.Z.**

Core XIV

Apparel Costing

UNIT –I

Principles of costing – requirement of good costing system – cost unit- types of cost – Fixed cost – Variable cost – Semi variable cost – Conversion cost – Replacement cost – Differential cost – Imputed cost – Sunk cost – Research cost – Development cost – Policy cost – Shutdown cost.

UNIT-II

Elements of cost – Direct material cost – Direct expenses – Direct wages – Indirect material cost – Indirect expenses – Indirect labour overheads- Production overhead – Administrative overhead –selling overhead – Distribution overhead – Prime cost – Work cost – Cost of production – Total cost.

UNIT – III

Cost estimation of yarn, fabric and components, dyeing, printing and finishing. Cost estimation for cutting, stitching, checking, packing, forwarding, shipping and insurance.

UNIT –IV

Cost of product development. Analysis of Design cost- profit design – product profitability.

Function of cost control – Apparel manufacturing cost categories – sales cost control – purchasing cost control – production cost control.

UNIT- V

Costing of various garments – Children’s wear , Women’s wear, Men’s wear.

Reference

1. Apparel Manufacturing Analysis – Solinger Jacob
2. Production Costing – Khanna Publications
3. Development Banks and Enterprises
4. Fashion Design and Product Development – Harold Carr/ John
5. Garment Technology for Fashion Designer –Gerry Cooklin.

Core XV

Apparel Export trade Documentation

UNIT-I

Export marketing of apparel, Global seen, Prospects for Indian apparel in overseas market, Globalisation.

UNIT-II

GATT and WTO Agreement and Bilateral Textile – Agreements signed by India with importing quota countries.

UNIT-III

Government of India's export entitlement policy on garment exports. A.E.P.C.'s role in the administration of export entitlement policy export promotional activities of A.E.P.C.

UNIT-IV

Facilities available for garment exporters

**Cash compensatory support
Duty draw back
Export finance through banks
Export credit guarantee corporation
Export- Import bank.**

UNIT-V

**Marketing - Market development assistance
100% Export Oriented scheme of the government of India
Free trade zone.
How to start a Garment exporting company?**

Reference:

1. Effective Export Marketing of Apparel – Darlie O. Koshy.
2. Export Marketing – A practical guide to exporters – S. Sivaramu.

Core XVI Clothing care and Wardrobe planning

UNIT - I

**Classification and introduction to laundry processes (2) -(i) Wet and (ii) dry cleaning -
Materials equipments used in laundry.**

UNIT – II

Bleaches – Classification, commercial products, application of bleaches to various fiber and fabric.

UNIT – III

Wardrobe planning and factors to be considered while selecting clothes for different age groups (men and women)

UNIT – IV

Additives used in laundry – optical brighteners: bleaching agents vs. fluorescent whiteners.

UNIT – V

**Preservation and storage – Apparel and household linen.
Disinfections of clothes.**

Reference

1. **Dulkar Durga (1976): Household Textiles and laundry work, Delhi Atmaram and sons.**
2. **Alexander, R. R (1977) : Textiles products selection, use and care Boston Houghton Mifflin Co.**
3. **Joseph Marjory (1981) : Introductory Textile Science, New York, Holt, Rinehart and Winston.**

Core XVII

Apparel productions and Quality Management

UNIT-I

Quality definition – Quality and its necessity . Introduction – Inspection its importance- functions of inspection – systems of inspection – types of inspection – hundred percent inspection – sampling inspection – comparison of 100% inspection and sampling inspection.

UNIT-II

Quality control in Pattern Making, Grading. Marking, Stitching and Production Analysis – Co coordinating department activities – Distribution of tickets and Maintenance of records – Establishing Merchandising standards. The quality control of trims and fasteners, sewing thread and accessories.

UNIT-III

Management: Meaning and definition, Functions and Principles of Management – Planning, organizing, staffing, directing and controlling, Production and productivity.

UNIT-IV

**Human resource management: Objectives – Functions and principles of HRD.
Recruitment / Training of Supervisors and Executives.**

UNIT –V

- a. **Quality standards, SQC – Control charts – Sampling – its importance and use of sampling techniques. ISO 9000, ISO 14000. Total quality management, quality circles.**
- b. **Marketing channels, Advertising, Sales promotion, Material management – meaning and importance**

Reference

1. **Apparel Quality Control – Pradip Metha**
2. **Apparel Manufacturing Handbook – Jacob Solinger.**
3. **Modern production /Operations, Management – Elwoods Buffa and Rakesh**
4. **Industrial Engineering and Management – O.P..Khanna**
5. **Operations Management – T.G.Monks**
6. **Industrial Psychology M.L.Blum and J.C.Maylor**

Core XVIII Fashion port Folio Practical

UNIT –I

KIDS PROJECT

Mood board – Colour Palette – Customer Profile – Illustration – Specification sheet.

UNIT-II

WOMEN'S PROJECT

Mood board – Colour Palette – Customer Profile – Illustration – Specification sheet.

UNIT-III

MEN'S PROJECT

Mood board – Colour Palette – Customer Profile – Illustration – Specification sheet.

UNIT-IV

Importance of fashion. Application of port folio on dresses

Reference

1. **The style source book – Judith Miller, Stewart, Tabori and Chang, Newyork.**

APPENDIX AZ63

MANONMANIAM SUNDARANARUNIVERSITY, TIRUNELVELI-627012
B.SC.FASHION TECHNOLOGY
(Syllabus for those joined 2012 onwards)

SCHEME OF EXAMINATION – CBCS PATTERN

Part	Study components	Course title	Hours per week	Examinations				
				CIA	Univ. exam	Total marks	hours	Credit
SEMESTER-III								
Part III	Core V History of World Costumes	6	25	75	100	3	4	
	Core VI Apparel Merchandising & Marketing	6	25	75	100	3	4	
	Core-VII-Practical Fashion Illustration-II	6	40	60	100	3	4	
	Allied-III Elements of Garment Manufacture	4						
	Practical Construction of Garment Components Practical	2	25	75	100	3	4	
Part IV	Skill Based Course-I Pattern Drafting & Grading Practical	4	40	60	100	3	4	
	Non-Major elective-I Fashion Concepts (or) Embroidery and Surface Working	2	25	75	100	3	2	
	TOTAL	30					22	
SEMESTER-IV								
Part III	Core –VIII Sewing Technology	6	25	75	100	3	4	
	Core – IX-Practical Children and Men’s Wear Construction Practical	6	40	60	100	3	4	
	Allied-IV Textile Wet Processing	4	25	75	100	3	4	
	Allied Practical Textile Wet Processing Practical	2	40	60	100	3	2	
Part IV	Skill Based Course Creative art and Textile Furnishing	4	40	60	100	3	4	

Part III	Non-Major Elective-II Fashion Illustration (or) Fibre to Fashion	2	25	75	100	3	2	
	Major Elective-I Fashion Accessories (or) Fashion Forecasting	6	25	75	100	3	5	
Part V	Extension Activity (NCC, NSS, YRC, YWF)						1	
	TOTAL	30					26	
Part	Study components	Course title	Hours per week	Examinations				
				CIA	Univ. exam	Total marks	hours	Credit
SEMESTER-V								
I	Core X: Clothing care	4	25	75	100	3	4	
II	Core XI: Fashion and clothing Psychology	4	25	75	100	3	4	
III	Core-XII Textile testing and quality control	4	25	75	100	3	4	
	Core-XIII– (Practical) Embroidery and surface working	8	40	60	100	3	4	
	Skill Based Course Creative art and Textile Furnishing	4	25	75	100	3	4	
IV	Major elective Technical Textiles	6	25	75	100	3	5	
	TOTAL	30					25	
SEMESTER-VI								
I	Core –XIV Home Textiles	4	25	75	100	3	4	
II	Core – XV Quality control in apparel production	4	25	75	100	3	4	
III	Core-XVI Fashion Marketing	4	25	75	100	3	4	
	Core- XVII Fashion Draping	4	25	75	100	3	4	
	Core – XVIII - Practical Home Textiles	8	25	75	100	3	4	
	Core XIX DRAPING TECHNOLOGY	6	25	75	100	3	5	
	TOTAL	30					25	

Part V Extension Activities

1

Practical I - Embroidery and surface working

Practical II - Home Textiles

*** The above practicals will be conducted in the VI Semeste**

HISTORY OF WORLD COSTUMES**Unit I Origin of Clothing and Study of Indian Costumes**

Origin of clothing : Definition of costumes - grouping of dress by painting - cutting and other methods - role of costumes.

Study of Indian costumes : prevedic era - vedic and post vedic era - Maurya, Satvahana, Kushan and Guptha dynasty - Mughal period - costumes of the British period - traditional costumes and textiles of India - contemporary fashion scenario.

Unit II Heritage Indian Costumes

Study of Dacca muslin - Jamdhani, Himrus and Amrus carpets - Kashmiri shawls - Kancheerapuram silk, Madurai chungadi and Balucheri sarees - Paithani, Bandhani, Patola, Ikkat and Kalamkari printing and dyeing of textiles.

Unit III Ancient Costumes of Asia and Europe

Asian Costumes : Ancient costumes of China, Japan and Sri Lanka.

European Costumes : Origin of costume - development of costume - Greek, Roman and Egyptian costumes.

Unit IV European and American Costumes of Earlier Centuries

Costumes of 16th to 18th Century : Costumes for men, women and children in UK, France and USA with accessories.

Costumes of French revolution upto early 19th century :

Revolutionary period (1789 - 1815) - Monarchy (1789 - 1792) - The Republic (1792 - 1795) - The Directory period (1795 - 1799) - Consulate and Empire (1799 - 1815).

Unit V Concepts of Contemporary Fashion

Origin of fashion - fashion language - philosophy of design - fashion promotion - fashion merchandising - fashion photography - fashion shows - fashion forecasting - fashion trend - fashion jewelry and accessories. Study of leading fashion designers - Indian, French, Italian, English and American.

Text Books :

1. *Russel Gllow, Nicholas Barnard, "Traditional Indian Textiles"*, Thames and Hudson Ltd., London 1991.
2. *Bhushan, Jamila Brij, "The Costumes and Textiles of India"* D.B. Taraporevala Sons & Co. Private Ltd, Bombay, 1958.
3. *Sumathi G.J, "Elements of Fashion and Apparel Design"*, New Age International (P) Ltd., Publishers, New Delhi, 2002.
4. *Churye G.S, "Indian Costume"*, Ramdas Bhatkal for Popular Prakashan Pvt Ltd, Bombay, 1995.

References :

1. *Francois Boucher, Yvonne Deslandres "A History of Costume in the West"*, Thames & Hudson Ltd., 1996.
2. Alice Mackrell, "An Illustrated History of Fashion (500 Years of Fashion Illustration)", Costume & Fashion Press, New York, 1997.
3. *Elizabeth Ewing, "History of 20th Century Fashion"*, Quite Specific Media Group Ltd., 2002.
4. *Jack Cassin - Scott, "The Illustrated Encyclopedia of Costume and Fashion"*, Cassell, 2006.
5. *Karen Baclawski, "The Guide to Historic Costume"*, Drama Publishers, 1995.
6. *Roshen Aekazi, "Ancient & Medieval Indian Costumes - 2 Volumes"*, 2009.
7. *Roshen Aekazi, "Ancient Indian Costume"*, South Asia Books, May 1985.

SEMESTER III**CORE VI****APPAREL MERCHANDISING AND MARKETING****Course Objective :**

- i) To learn about the fundamentals of apparel marketing, various apparel market types and sales promotion techniques.
- ii) To learn about various types merchandising, types of buyers, communication with buyer and consumer and consumer behaviour.
- iii) To understand the concept of product development, fashion life cycle, fashion flow theories, fashion forecasting, trade fairs and fashion shows as part of merchandising.
- iv) To learn about pricing, factors affecting the pricing of various segments of the garment industry and sourcing of accessories.
- v) To study about the role of merchandiser in apparel industry.

Unit I

Apparel Marketing : Apparel marketing - definition, meaning scope functions - marketing strategies - market research - study of markets - textiles markets - retail and wholesale markets - domestic markets - international markets - factors influencing the domestic and international markets - designer labels - chain stores - brand marketing - advertising - types of advertising - different media in apparel marketing - sales promotion techniques.

Unit II

Apparel Merchandising : Merchandising - definition - types of merchandising - fashion merchandising - apparel merchandising - retail merchandising - visual merchandising - principles of merchandising - role of merchandiser - types of buyers - communication with buyers and consumers; consumers demand - consumer behaviour in fashion.

Unit III

Product Development : Product planning and development - product mix, factors influencing change in product mix - fashion life cycle - fashion flow theories - leaders of fashion - role of designer - fashion forecasting - trend forecasting and auxiliary services - how to use forecasting services - trade fairs and fashion shows.

Unit IV

Pricing and Sourcing : Pricing theory - factors affecting price structure in apparels - mark up and mark down - sourcing - definition - need for sourcing - method of sourcing - sourcing of accessories - linings - buttons - zippers - labels - manufacturing resource planning - supply chain management - demand chain analysis - just in time technology.

Unit V :

Role of Merchandiser : Time management in merchandising - production scheduling - route card format - yarn requirements (knitted garments) - accessories follow-up - various follow-up processes - practical check points - computer application in marketing and merchandising

Text Books :

1. *Moore Evelyn, C*, “**Path for Merchandising - A Step - by - Step Approach**”, Thames and Hudson Ltd., 2001.
2. *Vijay Barotia*, “**Marketing Management**”, Mangal Deep Publication, 2001.

References :

1. *Jamow J., Dickerson K. G.*, “**Inside the Fashion Business**”, Prentice Hall, 1997.
2. *Shivaramu S.*, “**Export Marketing**” - **A Practical Guide to Exporters**”, Wheeler Publishing (1996).
3. *Stone Laine, Samples Jean A*, “**Fashion Merchandising**”, McGraw Hill Books, 1995.

SEMESTER III

CORE - VII

FASHION ILLUSTRATION - II PRACTICAL

List of Experiments

Part I - Men Illustration

1. Men Illustration on the background of Party.
2. Men Illustration on the background of Office.
3. Men Illustration on the background of Playground.

Part II - Women Illustration

4. Women Illustration on the background of Party
5. Women Illustration on the background of Office.
6. Women Illustration on the background of Shopping.

Part III - Men and Women Illustration

7. Men and Women Illustration on the background of Party.
8. Men and Women Illustration on the background of Shopping.
9. Men and Women Illustration on the background of Temple.

Part IV - Children Illustration

10. Children Illustration on the background of Playground and Picnic.
11. Children Illustration on the background of Playground and Picnic.
12. Children Illustration on the background of Playground and Picnic.

Part V - Outdoor Practice

13. Outdoor Sketching and Sculpture studies.

SEMESTER III

Allied - III

ELEMENTS OF GARMENT MANUFACTURE

UNIT I

Seams : Definition, Types of seams, Federal classification, factors to be considered in the selection of seam, seam finishes, Seam defects.

Stitches : Definition, stitch classes, Federal classification stitch parameters, factors to be considered in the selection of stitches. Stitching defects.

UNIT II

Sleeves : Types of sleeves, plain, puffs, gathered, bell, bishop, circular, leg-o-mutton, Magyar sleeves, raglan, dolman, kimono.

Collars : Classification of collars, types of collars - convertible, shirt collar with stand, straight collar, flat collars (peter pan, scalloped collar, flared, puritan collar, sailor collar) square collar, rippled collar, mandarin, tie, shawl, rever and notch collar.

UNIT III

Pockets : Types - patch pocket, patch with lining / flap, front hip, set-in seam, slash pocket with flap - single lip, double lip.

Cuffs : Types, square shape, round shape.

Waist Band : One piece, two piece and tailor waist band, elastic applied.

Introduction and construction techniques of garment closures. Application of zippers-fly, kissing lap, button & button holes, hooks, and eye snaps. Velcro, eyelets, cords.

UNIT IV

Plackets : Types, regular, top stitched with edge stitch, top stitched with one leg of pressure foot distance, concealed plackets, kurta plackets. Sleeve placket : faced placket, continuous bound placket and diamond placket.

Yokes : Definition - Selection of yoke design, different styles of yoke. Simple yoke - yokes with or without fullness - midriff yokes, methods of attaching yokes.

Hemming Techniques : Definition, factors to be considered in the selection of hems, types of machine stitched hem, hand stitched hem.

UNIT V

Fullness : Definition types - Darts single, double, pointed darts - Tucks; pin tucks, cross tucks, piped tucks, shell tucks, - pleats; knife pleats, box pleats, invertible box pleats, kick pleats - flare - godets - gathers - shirring - single or double frills - ruffles and flounces.

Text Books :

1. *Cooklin Gerry*, “**Garment Technology for Fashion Designers**”, Blackwell Science Ltd., 1997.
2. *Claire Shaeffer*, “**Sewing for Apparel Industry**”, Prentice Hall, 2000.
3. *Mary Mathews*, “**Practical Clothing Construction Part I & II**”, Paprinpack, Chennai, 2000.

References

1. *Leila Aitken*, “**Step by Step Dress Making Course**”, BBC Books, 1992.
2. *Sumathi, G.J.*, “**Elements of Fashion and Apparel Design**”, New Age International (P) Limited Publishers., 2005.
3. *Harold Carr and Barbara Lathem*, “**The Technology of Clothing Manufacture**”, Blackwell Scientific Publications, London, 1988.

SEMESTER III

Allied - III Practical

CONSTRUCTION OF Garment COMPONENTS PRACTICAL

List of Experiments

1. Identification of machine parts and their functions - Single Needle Lock Stitch, Over Lock, Flat Lock machine with samples.
2. Preparing samples for basic hand stitches.
3. Preparing samples for seams and seam finishes.
4. Preparing samples for single and double pointed darts, fullness and tucks - Pin tuck, cross tuck and scalloped tuck.
5. Preparing samples for pleats - knife, box, inverted and pinch pleats. Godets, gathers and shirring.
6. Preparing samples for necklines - cutting and joining bias strip, bias facing, bias binding and fitted facing.
7. Preparing samples for collars - Peter pan collar, partial roll Peter pan collar, cape collar, scalloped collar, puritan collar, sailor collar, square collar, Chinese collar, turtle neck collar, full shirt collar and shawl collar.

8. Preparing samples for pockets - Patch pocket, set-in pocket and pocket set into seam.
9. Preparing samples for sleeves - Set-in-sleeve, Plain sleeve, Puff at top and bottom, Bell, Bishop, Circular and Mutton - O-Leg sleeve - Sleeveless styles. Bodice and sleeve combined - Kimono and Raglan sleeves.
10. Preparing samples for yokes - simple yoke, partial yoke and midriff yoke.

SEMESTER III

SKILL BASED COURSE I

PATTERN DRAFTING AND GRADING PRACTICAL

List of Experiments

1. Develop pattern and grade the following Children's wear.
 - i. Baba suit
 - ii. Rompers
 - iii. Round neck T-Shirt
 - iv. Baby frock
2. Develop pattern and grade the following Women's wear
 - i. Salwar Kameez
 - ii. Blouse
 - iii. Skirt and top
 - iv. Brassiere
 - v. Panties
 - vi. Nighty
 - vii. Gown
3. Develop pattern and grade the following Men's Wear
 - i. Shorts
 - ii. Formal shirt
 - iii. Formal trousers
 - iv. Jeans
 - v. Brief
 - vi. Vest RN and RNS
 - vii. Polo T shirt

Fashion Designing
Non Major Elective (III Semester)

1. Fashion Concept

UNIT - I

Fashion - Style - Fad Definition - Sources of Fashion - Terms related to Fashion Industry - Boutique, Collection, Classic Chic Fashion Shows, Fashion Trends and High Fashion.

UNIT - II

Role of designer - Researching the market. Design process, sample production. Sources of design inspiration. Types of designer - High fashion designer, Moderate designer, Stylist and free-lance designer.

UNIT - III

Colour - definition characters of colour, theory, colour schemes, colour psychology, visual and physical effect of colour, colour & texture, colour marketing systems. Value & intensity of colour.

UNIT - IV

Design and Principles of design, Definition, types of design - structural and decorative design, characteristics of a good design, elements of design - principles of design - Definition - Harmony - Proportion - Scale, balance - Rhythm - Emphasis - and its application in dresses.

UNIT - V

Components of fashion - Silhouette, Texture, colour, Acceptance change, Environment of fashion - Economic factors, sociological factors, Physical factors Psychological factors. Movement of fashion - Cycling of fashion, Stages of fashion cycle.

References

1. Goldstein and Goldstein. Art in Everyday life. Mac Millan and co. New York.
2. Mathews M. Practical clothing construction. Part - III cosmic Press, Madras.
3. Markstorm, Dorthy and Jane. Guide to Modern clothings, MC, Graw Hill Boom Company, New York.

Non Major Elective (III Semester)

2. Embroidery and Surface Working

UNIT - I

Hand embroidery, Running stitch, back stitch, stem stitch, blanket stitch, lazy daisy stitch, chain stitch, herring bone stitch, fish bone, seed stitch and cross stitch.

UNIT - II

Feather - single and double, rommanian stitch, fly stitch, long and short stitch, French knot, bullion knot, double knot, satin stitch and couching.

UNIT - III

Machine embroidery, Running stitch, cording stitch, satin stitch, long and short, round stitch and eyelet work.

UNIT - IV

Traditional Indian embroidery, Kashida of Kashmir, kantha of Bengal, phulkari of Punjab, embroidery of kutch and Kathiawar, kasuti of Karnataka, chikankari of lucknow.

UNIT - V

Creating style through surface trimming, Cut work, bead work, sequence work, mirror work, patch work, applique work, quilting, fabric painting, drawn thread work, faggoting and smocking.

Reference :

1. Practical clothing construction part I & II - Mary Mathew
2. Indian Embroidery - Kamala devi
3. Creative art of embroidery - Barbara snook.

SEMESTER IV

CORE VIII

SEWING TECHNOLOGY

UNIT - I

Introduction to clothing manufacture - Brief study on sequence of process. Spreading - Methods of spreading - Spreading machines. Marking - Methods of marking - Types of markers and computer aided markers.

UNIT - II

Cutting technology - Definition, functions and scope. Cutting equipments and tools - vertical reciprocity cutting machine, straight knife cutting machine, rotary knife cutting machine, and knife cutting machine, dia cutters, cutting drills and computerized cutting machine.

UNIT - III

Introduction to sewing machine - Sewing machine parts and functions - Sewing needle functions, parts and their usage, metric and singer systems of needle size and their relationship to thread sizes, various cloth points and application, needle problems. Machine attachments - Guides and Folders - Tools for clothing construction - Usage of different tools.

UNIT - IV

Use and care of the sewing machine - Types of sewing machine - Chain stitch machine, Single Needle Lock Stitch (SNLS) machine, Bar tacking, Button holder, Button sewer, Blind stitching machine.

UNIT - V

Mending - Trimming and decoration. Darning and patch work - Structural and applied decorations - Sequence - Printing - Bias tubing, Lace work - Tassels - Fringes - Pompom - Drawn thread work - Quilting - Bow - Tie - Belt - Smocking - Applique - Garment finishing machine - Steam iron and stain remover.

Text Books :

1. *Mary Mathews*, **“Practical Clothing Construction Part I and II”**, Cosmic Press, Chennai.
2. *Barbara Latham and Harold Carr*, **“The Technology of Clothing Manufacture”**.
3. *Gerry Cooklin*, **“Introduction to Clothing Manufacture”**, Blackwell Science Ltd, England (1991).
4. *Eswari Anwani Lachraj Hanns*, **“Cutting and Tailoring Technology”**. R.B. Publications, New Delhi.

Reference :

1. **“Reader’s Digest sewing guide - Complete guide to sewing, 13th Edition”**, The Reader’s Digest Association Inc. Pleasant Ville, New York.
2. *Coles M. Sew*, **“A complete guide for sewing today”** Heinemann Professional Publishing, Singapore.
3. *Mushero and Elizabeth. I*, **“Sewing short cuts from A to Z”**, New York Nortrand Reonhold 1978.
4. *Dora.S.Lewis and Mabel Goode Bowers and Marietta Kettunen*, **“Clothing Construction and Wardrobe Planning”**, The Macmillan Company : New York 1955.
5. *Terry Brackenbury*, **“Knitted Clothing Technology”**, Blackwell Science Ltd., UK.
6. *Ruth.E, Glock and Grace.I, Kunz*, **“Apparel Manufacturing”**. Pearson Education, New Delhi.
7. Brochures and Catalogues of various machinery manufacturers.

CHILDREN AND MEN'S WEAR CONSTRUCTION PRACTICAL**List of Experiments**

1. Construct the following Children's wear as per the given specification.
 - i. Baba suit
 - ii. Rompers
 - iii. Round neck T-Shirt
 - iv. Baby frock
 - v. Shirt and trouser
2. Construct the following Men's Wear as per the given specification.
 - i. Shorts
 - ii. Half sleeve shirt
 - iii. Full sleeve shirt
 - iv. Formal trousers
 - v. Jeans
 - vi. Cargo pant
 - vii. Brief
 - viii. Vest
 - ix. Basic T-shirt
 - x. Polo T-shirt

TEXTILE WET PROCESSING**Unit - I : Study of Water**

Water and quality required for wet processing - Softening process : ion exchange process and sequestering agent method - Terminology related to textile processing industry - Role of textile auxiliaries.

Unit - II : Preparatory Processes

Singeing - Objects and methods - Desizing - Objects and methods - Scouring - Objects, methods and changes taken place during scouring - Bleaching - Objects and types of bleaching agents - Bleaching process - Optical whiteners and blueing agents. Mercerization - Objects and methods of mercerizing yarns and fabrics.

Unit - III : Dyeing

Dyes - Classification - Various forms of dyeing of textile materials - Principle and application of various classes of dyes - Direct, Reactive, Vat, Sulphur, Acid, Basic and Disperse Dyes - Principle of dyeing of blended textile materials - After treatment - Classification and working principle of different dyeing machines - Yarn dyeing machines - Padding Mangle - Jigger - Winch - Soft Flow - Brief study on continuous processing range for woven and knitted goods.

Unit - IV : Printing

Principles of printing - Comparison of dyeing and printing - Printing styles and methods - Screen Preparation - Printing ingredients and their role - Recipe for cotton and polyester fabric printing - After treatments - Detailed study of working principles of printing machines - Table screen, flat bed screen, rotary screen, roller printing and thermal transfer printing. Study on pigment printing.

Unit - V : Finishing

Objects of finishing - Classification of finishing - Mechanical finishing - Calendering, stentering, compacting, raising, shearing and pseuding - Chemical finishing - Starching, softening, fragrance, wrinkle free, anti crease, anti microbial, anti fungal, anti bacterial, Ultra Violet protection, flame retardant, water proof and water repellent. Study on garment washes - Silicone, enzyme, stone and sand washing.

Text Books :

1. *V.A. Shenai*, “**Technology of Textile Processing - Volume III, V, VII & VIII**”, Sevak publications, Bombay, 1981.
2. “**Chemical Processing of Textiles - Grey Preparation and Dyeing**” - NCUTE Publication, New Delhi, 2004.
3. *Trotman, E.R.*, “**Dyeing and Chemical Technology of Textile Fibres**”, Charles Griffin and Co. Ltd., London. 1990.
4. *Nalankilli.G, Edwin Sundar.A*, “**Chemical Preparatory Processes for Textiles**”, NCUTE Publications, New Delhi, 2002.

References :

1. *Palmer John. W*, “**Textile Processing and Finishing aids recent advance**”, Mahajan Book Distributors, 1996.
2. *James Ronald.W*, “**Printing and Dyeing of fabrics and Plastics**”, Mahajan Book Distributors 1996.
3. *Marsh J.T.*, “**Mercerizing**”, Chapman and Hall Ltd., London, 1941.
4. *Bhagwat R.S.*, “**Handbook of Textile Processing**”, Colour Publication, Mumbai, 1999.
5. *Bhagwat R.S.*, “**Hand book of Textile Processing Machinery**” Colour Publications, Mumbai 1999.

TEXTILE WET PROCESSING PRACTICAL

1. Desize the given Cotton material with the help of acid and estimate the % of size removal.
2. Scour the given Cotton material and estimate the scour loss.
3. Bleach the given cotton sample by using Hydrogen Peroxide.
4. Estimate the hardness of water.
5. Dye the given Cotton sample with direct dyes.
6. Dye the given Cotton sample with reactive cold brand dyes.
7. Dye the given Cotton sample with reactive hot brand dyes.
8. Dye the given Cotton sample with reactive Vinyl Sulphone dyes.
9. Dye the given Cotton sample with reactive HE dyes.
10. Dye the given Cotton sample with Vat dyes through leuco vat process.
11. Dye the given Wool sample with acid dyes.
12. Dye the given Silk sample with acid dyes.
13. Dye the given Nylon sample with acid dyes.
14. Dye the given Acrylic sample with basic dyes.
15. Dye the given Polyester sample with disperse dye by using carrier.
16. Dye the given fabric sample through tie and dye technique.
17. Print the given fabric sample with block printing technique.
18. Prepare the printing paste with reactive dyes and print on the given fabric with discharge Style.
19. Print the given fabric with the paste made up of reactive dyes with resist style.
20. Develop a Batik motif and print on the given sample.

**Skilled Based Subject
Creative Art and Textile Furnishing**

UNIT - I

Art - Meaning, functions, forms of creation, principles of art.
Preparation of creative art - Paper, Puppets, basket.

UNIT - II

Creative arts from waste - Rugs, Patch work, braid, lampshade, quilt mat, pen stand, decorative pots.

Preparation a file cover, bag and book binding.

UNIT - III

Define furnishing - Different types of furnishing for Living room - sofa covers, wall hangers, cushion, cushion covers, Upholsteries, Bolster and Bolster covers.

UNIT - IV

Bed Linens - Definition, Different types of bed linens, sheets, blanket covers, comfort covers, bed spreads, mattress and mattress covers and pads, pillows and pillow covers, Use and Care.

UNIT - V

Kitchen and Table Linens - Definition, Types of Kitchen linens, Table cloth, Table cover, Mat and types. Dish cloth, Hand towels, Fridge cover, Fridge handles, Mixi cover, Grinder cover, their Use and Care.

Reference

1. Soft Furnishing - MAC DONAID
2. Designing Interior Environment - ALEXANDER N.G.
3. Interior Decoration in India - DONSERKERY K.G.
4. The House Style Book - DEYAN SUDJIC.
5. House Hold Manual - ELIZABETH GUNDREY.

Non Major Elective (IV Semester)

1. Fashion Illustration

UNIT - I

Human anatomy - Study of human anatomy in terms of shapes, sizes and movements.

UNIT - II

Drawing a flesh figure - Drawing a fleshy figure from a stick figure. Dividing the figure into various part using lines like plumb line, centre front line, princess line, waist line, side seam, arm hole, jewel neckline, pantyline, bust line etc.

UNIT - III

Drawing the face of the croquic - Drawing the face of a fashion figure proportion and placement of facial features, each feature to be dealt separately and faces to be analyzed into croquic face.

UNIT - IV

Drawing hairstyles and accessories on the croquic, Drawing various fashionable hair styles and accessories on the croquic.

UNIT - V

Women's project, Create a mood board - color palette - Customer profile - Illustration - Specification sheet.

Reference :

1. The style source book - Judith miller, Stewart, tabori and chang, Newyork.
2. Fashion drawing the basic principles by Anne Allen and Julian Seaman.
3. Design studied by Manmeet sodhia - Kalyani Publishers.

Non Major Elective (IV Semester)

2. Fibre to Fashion

UNIT - I

Textile fiber - Definition - Properties of textile fiber - Classification of fibre, Brief Study and important properties of cotton, Silk, Wool rayon and polyester best fibres - Influences of fiber properties on fabric characteristics.

UNIT - II

Yarn definition, Classification, types.

UNIT - III

Weave - Definition, Classification, Study on basic weaves.

UNIT - IV

Fashion - Style - Fad Definition - Sources of Fashion - Terms related to Fashion Industry - Boutique, Collection, Classic Chic Fashion Shows, Fashion Trends and High Fashion.

UNIT - V

Role of designer - Researching the market. Design process, sample production, Sources of design inspiration. Types of designer - High fashion designer, Moderate designer, Stylist and freelance designer.

SEMESTER IV

MAJOR ELECTIVE I

FASHION ACCESSORIES

Unit - I

The Concept of three - dimensional sketching and relation to accessories design - Concentrating on design detail, sketch the basic shapes of footwear, handbags, hats, gloves, personal leather goods, etc. Introduction to accessory design. Various types of shoes, handbags, hats and gloves.

UNIT - II

Selection of Materials, design, functional and aesthetic performance and their advantages - Ribbons, braids, laces, appliques, buttons, zippers, snap fasteners, hooks and eyes, hook and loop tape (velcro), eyelets, tie, scarves, stoles, umbrella, socks and veils.

UNIT - III

Selection of materials, design, functional and aesthetic performance and their advantages - and the various styles - footwear, belts, gloves, hand bags, hats and wallets. Concepts of pattern making techniques, basic machinery and equipment used for these accessories.

UNIT - IV

Selection of materials, design, functional, aesthetic performances and their advantages - various styles - key chain, sun glass, wrist watches, rings, ear rings, bangles, bracelets, anklets, pony tail holder and pen.

Text Books :

1. *Gini Stephens Frings*, “**Fashion from Concept to Consumer**”, Pearson Education Ltd., 7th Edition, 2001.
2. *Jeannette A. Jarrow, Miriam Guerrerio, Beatrice Judelle*, “**Inside the Fashion Business**”, Macmillan Publishing Company, Newyork, 4th Edition, 1987.
3. *Gross, Kimjohnson, Stane. Jeff*, “**Accessories**”, Thames and Hudson Ltd., 1996.

Reference :

1. *Bhargar, Ritu*, “**Design Ideas and Accessories**”, B.Jain Publishers (P) Ltd., 2005.

SEMESTER IV**MAJOR ELECTIVE II****FASHION FORECASTING****Unit - I - Introduction**

The evolution of fashion - history of couture - 20th century influences on fashion, 1990 - 1990's, highlights of famous fashion designers - segments of fashion industry - location of fashion markets - forecasting specialities - prediction of fashion - future of fashion.

Unit - II - Powerful Consumer

Trendsetters and leaders - market segments, consumer research, socio-economic and psychological factors, buying motives, fashion and consumer research, quality movement in fashion industry.

Unit - III - Women's, Men's and Children's Apparel

Women's wear markets, history and growth, classifications, price points, size specialization - selling seasons - promoting women's wear - men's wear markets, classifications, size specialization - selling men's wear - children's wear classifications, size classifications, price lines - promoting children's wear - fashion accessories and intimate apparel.

Unit - IV Forecasting for Designers and Manufacturers

The fashion forecasting process - steps in developing a forecast - forecast reports - steps in textile development - fiber forecast report, fabric forecast report - steps in colour forecasting - colour forecast reports - specialized forecasting and its reports.

Unit - V Fashion Promotion

Auxiliary fashion enterprises - fashion information and advisory services, news media, advertising the publicity agencies fashion retailing in the past, current trend, classifying the retailers, retailer locations, organizational structures, services offered, purchasing, developing a fashion image.

Text Books :

1. *A.Jeannette Jarrow, Miriam Guerreiro and Beatrice Judelle*, “**Inside the Fashion Business**”, 6th edition, Prentice-Hall of India, 1996.
2. *Dickerson, Kitty G.*, “**Inside the Fashion Business**”, Pearson Education Asia Publishing, 2004.

References :

1. *Frings, Gini Stephens, "Fashion : From Concepts to Consumer"*, Prentice - Hall of India, 8th edition, 2004.
2. *Waddell, Gavin, "How-to-Fashion Works Couture, Ready-to-Wear and Mass Production"*, Om Books Services, 2005.

Semester –V Core-X CLOTHING CARE

UNIT- I WATER AND CARE LABELLING:

Types of Water- Hard and soft water. Hardness of water- Temporary and permanent hardness. Problems caused by hard water. Methods of softening water. Care labeling.

UNIT-II SOAPS AND DETERGENTS:

Definition, Manufacture, Properties and their cleansing action, Indigenous cleaning agents like Rita nut, Shikkakai and Bran.

UNIT-III LAUNDERING AGENTS USED:

Stiffening agents-Natural and commercial starches. Bleaching agents, Bluing agents. Optical brighteners. Additional laundering agents-Acidic, Alkaline and Others.

UNIT-IV PRINCIPLES OF LAUNDERING:

Stain Removal. Methods of washing-Wet cleaning, Dry cleaning.

Wet Cleaning:

- 1) Application of friction-Hand friction, Rubbing, Scrubbing.
- 2) Application of light pressure- Kneading, Squeezing.
- 3) Suction washing.
- 4) Washing by machine.

Dry Cleaning:

Methods of finishing-Damping, Ironing.

UNIT-V MATERIAL AND EQUIPMENTS IN LAUNDRY:

Laundering for different fabrics- Cotton, Wool, Silk, Rayon, Preservation and storage. Disinfection of cloths.

Reference:

1. Noemia D' Souza, **Fabric Care**, New Age International Publishing House
2. Sushma Gupta, Neeru Garg, Renu Saini, **Text Book of clothing Textile and Laundry**, Kalyan Publishers, Chennai, 1989
3. Susheela Dantyagi, **Fundamentals of Textile and their care**, 5 th edition, Orient Longman Ltd., New Delhi.
4. Durga Delukar, **House hold Textiles and Laundry Work**, Atmaram & sons, 1980.

Core XII

Fashion and Clothing Psychology

UNIT – I

Fashion Accessories – Shoes, handbags, jewelry, hats, ties and others. Prepare an album for accessories.

UNIT– II

Figure irregularities – stout figure, thin figure, slender figure, narrow shoulders, broad shoulders, round shoulders, large bust, flat chest, large hip, large abdomen, round face, large face, small face and broad face, prominent chin and jaw and prominent forehead.

UNIT– III

Factors affecting fashion changes – Psychological needs of fashion, Psychology of fashion, Technology, Economical, Political, legal and seasonal.

UNIT – IV

Recurring silhouettes – changes in silhouettes; fashion cycle; Prediction fashion; Role of costumes as status symbol, clothes as sex appeal, self identity, cultural value.

UNIT– V

Understanding Fashion Designer: Designer types – classicist, idealist, Influenced, Realist, Thinking poet.

Reference

1. Benneett “Femina Book of Fashion”, Coleman & Co., Ltd., Mumbai (1998)
2. Jeanettee. A. Jarnow, Miriarn Guerrerio, “Inside the Fashion Business”, Mecmillion PublishingCompany New York 1987.
3. HarrietT. Mcjimesey, “Art and Fashion in clothing selection”, The Iowa state University Press, Ames, Iowa 1973.

TEXTILE TESTING AND QUALITY CONTROL

UNIT – I

Introduction to Textile Testing and Quality Control – Definition, General aspects of Textile testing and quality control, Routine tests performed in Textile Industry. Benefits of testing, International standards for textile and apparel testing.

UNIT – II

FIBRE ANALYSIS:

Identification of Textile Fibre – Burning, Solvent, Longitudinal and Cross sectional view of Cotton, Wool, Polyester, Nylon, Acrylic fibres. Cotton fibre length, Cotton fibre strength, Fibre fineness and Nep Potential – Trash.

UNIT – III

YARN ANALYSIS:

Yarn numbering, Yarn strength, Twist testing, Additional test for fibres and Yarn –Microscope, Weight method, Air flow method, Wet strength and elongation of filament yarn, Knot strength, Loop strength for filament yarn, Crimp.

UNIT – IV

FABRIC ANALYSIS:

Length, Width, Bow, Skew ness, Weight, Thickness, Breaking Strength, Abrasion Resistance, Crease Recovery, Stiffness of fabrics and drapability.

UNIT – V

Standards and specification in Textile Industry, Quality control aspects, Colour fastness tests in Textiles – Crocking, Perspiration, Sunlight, Laundering.

Reference:

- 1.Booth J.E.**Principles of Textile Testing**, CBS Publishers, 1996.
- 2.Elliot.B.Grover and Hamby.D.S.**Textile Testing and Quality Control**, Eastern Ltd.,
- 3.Satish K.Bhardwaj and Pradip , V. Metha, **Managing Quality in Apparel Industry**, Newage Internaional Publishers,2000.

EMBROIDERY AND SURFACE ORNAMENTATION

Prepare the sample for the following :

1. Hand and Machine Embroideries
2. Traditional Indian Embroideries
3. Creating styles through surface trimmings
4. Appliqué work
5. Patch work
6. Mirror work
7. Sequins work
8. Bead work.

1. Nirmal C.Mistry, **Embroidery** ,Navaneeth Publications Ltd.,1999
2. Kit Pynan and Carole, **The Harmony Guide to Decorative Needle Craft**, Lyric Books Ltd.,1982
3. Shailaja m. and Naik. D., **Traditional Embroideries of India** , KPH Publishing Coporation , 1996
4. Ritu, **Attractive Embroidery Designs** , Indica Publishers, 1995
5. **Modern Embroidery Series**, MBD Publishers, 1995.

Skilled Based Subject
Creative art and Textile Furnishing

UNIT – I

Art - Meaning, functions, forms of creation, principles of art.
Preparation of creative art – Paper , Puppets, basket

UNIT – II

Creative arts from waste – Rugs, Patch work, braid, lampshade, quilt mat, pen stand, decorative pots.
Preparation a file cover, bag and book binding.

UNIT – III

Define furnishing – Different types of furnishing for Living room – sofa covers, wall hangers, cushion, cushion covers, Upholsteries, Bolster and Bolster covers.

UNIT – IV

Bed Linens – Definition, Different types of bed linens, sheets, blanket covers, comfort covers, bed spreads, mattress and mattress covers and pads, pillows and pillow covers, Use and Care.

UNIT – V

Kitchen and Table Linens – Definition, Types of Kitchen linens, Table cloth, Table cover, Mat and types. Dish cloth, Hand towels, Fridge cover, Fridge handles, Mixi cover, Grinder cover, their Use and Care.

Reference

1. Soft Furnishing – MAC DONAID.
2. Designing Interior Environment – ALEXANDER N.G.
3. Interior Decoration in India – DONSERKERY K.G.
4. The House Style Book – DEYAN SUDJIC.
5. House Hold Manual – ELIZABETH GUNDREY.

Semester –V

Major Elective -II

TECHNICAL TEXTILES

UNIT-I:

Technical Textiles –Definition and Scope . Brief study on various categories of Technical Textiles.

UNIT-II:

Medical Textiles – Classification. Fibres used and their properties required.
Medical textile Products - Properties , functions.

UNIT-III:

Geo textiles – Definition,Fibers used in geo textiles – requirement of fibers.
Functions of GeoTextiles – Seperation, Filtration, Drainage, Reinforcement.

UNIT-IV:

Textiles for automotive industry. Suitable fibers for automotive industry.
Safety devices – Airbags- Materials used –types of fabric –Seat belts – Types, Fabrics used..

UNIT-V:

Brief study on Protective textiles – Bullet proof fabrics – fire retarding fabrics – high temperature fabrics –High visibility clothing . Fibres used and Properties of fabrics.

Reference:

1. **The design of Textiles for Industrial Application** – P.W.Harrison
2. **Protective Clothing** – Bajaj .P. and Sengupta A.K.
3. **Textiles: Fiber to fabric** – Corbman .B.P.
4. **Performance of Protective Clothing** – Johnson.J.S. and Mansdork. S.Z.

Semester –VI
Core- XIV
HOME TEXTILES

UNIT – I

INTRODUCTION TO TEXTILE FURNISHINGS

Definition, Different types of furnishing materials – Woven and Non – Woven. Factors affecting selection of home furnishings. Recent Trends in Home furnishing.

UNIT – II

Floor coverings – Hard floor coverings, Resilient floor coverings. Soft floor coverings – Rugs and Carpets, Use and Care.

Wall covering – Use and Care.

UNIT – III

Doors and Windows – Definition, Different types of Doors and Window, their application.

Home Decoration- Draperies – Choice of fabrics, calculating the amount of material needed, hints on making curtains hang well, Methods of finishing draperies at the top. Use of drapery rods, hooks, tape rings and pins.

UNIT – IV

Living room furnishing – sofa covers, wall hangers, cushion, cushion covers, Upholsteries, Bolster and Bolster covers.

Bed Linens – Definition, Different types of bed linens, sheets, blanket covers, comfort covers, bed spreads, mattress and mattress covers and pads, pillows and pillow covers, Use and Care.

UNIT – V

Kitchen and Table Linens – Definition, Types of Kitchen linens Dish cloth, Hand towels, Fridge cover, Fridge handles, Mixi cover, Grinder cover, their Use and Care.

Reference:

1. Jay Diamond , Ellen Diamond –**Fahion Apparel Accessories and Home Furnishing**, Pearson Education, 2007.
2. Premavathy Seetharaman , Praveen Pannu- **Interior Design and Decoration**, CBS Publication , 2007
3. Durga Delukar, **House Hold Textiles and Laundry Work** , Atmaram & Sons, 1980.

Semester –VI

Core –XV

QUALITY CONTROL IN APPAREL PRODUCTION

UNIT-I:

STATISTICAL QUALITY CONTROL:

Quality definition – Quality and its importance- Meaning of Qulaity control –SQC- Control Charts. Sampling- Importance and types of sampling techniques.

UNIT-II:

STANDARDS FOR QUALITY

Established Merchandising Standards- Standards for Quality – ISO implementation Procedure- ISO 9000 and ISO 14000 – six sigma

UNIT-III:

QUALITY SYSTEMS:

Total Quality Management – Objective and Phases of TQM , Quality Circle- AQL – Accepted Quality Level.

UNIT-IV:

PRODUCTION CONTROL:

Types of Control forms- Basic Production systems, flow process grids for production – Control Scheduling Calculation – types of Schedule.

UNIT-V:

QUALITY CONTROL IN APPAREL INDUSTRY

Quality control in designing , pattern making. Warehousing . Quality Control Trims, Fasteners, Sewing thread , Needle and Accessories. Inspection- stages and systems of inspection.

Reference:

1. Pradip V. Metha , Introduction to quality control for Apparel Industry ASQC Quality Press, Marcel Dekker, Inc. 1992
2. Chuter A.J. Introduction to clothing Production Management , Blackwell Publishing House, 1995
3. Pradip V. Metha, Managing Quality in the Apparel industry, Satish K. Bharadwaj, New age International (P) Ltd., Publishers, 2006.
4. Ruth.E. Glock Grece I Kunz, Apparel Manufacturing and Sewn Product Analysis, 2005.
5. Anita A Stephen Sue Hamphrice Sharp ,Linde B Donnel , Evaluation Apparel Quality , Fair Child Fashion Group , New group.
7. Sara J. Kadolph, Quality Assurance for textiles and Apparel , Fair Child Publications, Newyork.

Semester VI

Core- XVI

FAHION MARKETING

UNIT-I:

Birth of fashion – Source of design inspiration – Designers , Manufacturers and Retailers role . Fashion influence and theories of adoption – implication for Merchandising – Fashion leaders and Followers.

UNIT-II:

Business of Fashion – Scope of Fashion Business –Forms of business ownership – Business growth and expansion.

UNIT-III:

Children's/Men's/Women's Apparel industries. Organisation and the operation of the industry. Merchandising and Marketing activities – industry trends.

UNIT-IV:

Domestic fashion market – Market center .History and development of Fashion retailing – Types of Retailers of Fashion Merchandise. Fashion advertising - Visual Merchandising

UNIT-V:

Role of Merchandiser – Types of Merchandising. Export house – Manufacturer – Buying house. Trade fair participation and other methods of sales promotion.

Reference:

1. **Path for merchandising – a step by step approach** – Moore Evelyn.C.
2. **Inside the Fashion Business** – J.arnow and K.G. Dickerson
3. **Fashion Merchandising** – Laine stone, Jean A Semples .
4. **Effective Export Marketing of Apparel** – Darlie O'Koshy
5. **Textiles and Apparel in the Global Economy** – Dickerson K.G.

Semester VI

Core XVII

FASHION DRAPING

UN IT-I:

Definition of draping – draping tools and equipments – draping principles. Preparation of muslin for draping – Seam allowance –Preparation of Dress form for Draping.

UNIT-II

Draping of basic Bodice front- Preparation of Muslin – Draping Steps – Marking – Truing- draping of Basic Bodice Back- Draping of basic sleeves – Draping of Basic Skirt.

UNIT-III

DRAPING OF SKIRTS AND SLACKS

Draping of one piece basic skirt- Gored skirt – pleated skirt.

Draping of basic straight slacks- fitted slacks – Tapered slacks.

UNIT-IV:

DRAPING OF YOKES , SLEEVES AND COLLARS

Draping of midriff yoke-bodice yoke-shirt yoke.

Draping of Peterpan collar- Convertible collar- Mandarin collar.

Draping of basic Sleeve- Raglon sleeve- Kimono sleeve.

UNIT-V:

DRAPING OF KNIT GARMENTS

Draping of basic knit bodice pattern- Draping of Princess dress- draping of basic Jacket.

1. Draping for apparel Design ,Helen Joesph Armstrong, Harper Collins publishers.
2. Draping for Fashion Design – Hilder Jaffe, Murie Relis, Pearson Education 2012.
3. The Art of Fashion Draping - connie Amaden, Crawford – Fairchild Publications.
4. Draping Basics- Sally di marco, Fair child Publications

HOME TEXTILES

PREPARE THE SAMPLES FOR THE FOLLOWING

1. Pillow
2. Pillow Cover
3. Cushion
4. Cushion Cover
5. Different Types of Curtain
6. Bed Linen
7. Table Linen
8. Mixi Cover
9. Grinder Cover

DRAPING TECHNOLOGY

UNIT-I:

Definition of draping – draping tools and equipments – draping principles. Preparation of muslin for draping – Seam allowance –Preparation of Dress form for Draping. Draping of basic Bodice front- Preparation of Muslin – Draping Steps – Marking – Truing- draping of Basic Bodice Back- Draping of basic sleeves – Draping of Basic Skirt.

UNIT-II

Front Bodice with under ar dart- Back bodice with Neckline Dart- dart manipulation – waist line dart- dart at waistline and centre front – French Dart- double French Dart- Double French Dart- flange Dart- Neckline Dart- Bust line Dart at centre front- Armhole Dart. Pleats- darts- tucks- gathers – neckline variations- Front and back Armhole variations-Typical sleeveless – Squared – Cutaway.

Waistline Variation- lowered-Empire- shortened- scalloped-pointed . The Princess Bodice- Cowls- Yoke- Front – back- Square Cowl- under arm cowl- Wrapped Neckline , Cowl Twists- butterfly Twist – Two piece Bins twist Neck yoke twist- bust twist.

UNIT-III

Draping of skirts and slacks

Draping of one piece basic skirt- Gored skirt- Flared Skirt-Pleats in the Flared skirt- gathers in the Flared Skirt- Pleated skirt- Side and Box pleated Skirt- Kick pleated and inverted pleated Skirt

Draping of basic straight slacks- Fitted slacks- Tapered slacks-Pegged slacks- Divided skirts.

UNIT-IV:**Draping of Yokes , sleeves and collars**

Draping of fitted yoke- Bodice yoke- Shirt yoke –Hip yoke . Draping o Mandarin Collar- bank collar- Convertible collar- Peterpan collar . Draping of basic Dolman Sleeve- Long Fitted Dolman sleeve- semi mounted Sleeve- Raglon Sleeve- Kimono sleeve with gusset.

UNIT-V:**Draping of knit garments**

Draping of bias- cut slip dress- Bustier Designs- Basic knit bodice dress- knit Halter- Knit Leotard- Knit Panties.

Draping of Flounces- circular flounce- Shirred flounce- Draping of Ruffles- Variable ruffle finishes- draping of peplums. Draping of ‘A’ line shift- Draping of Princess dress- Draping of Basic Jacket.

Reference:

1. Draping for fashion Design – Hilde Jaffe, Nurie Relis, Prearso Education 2012
2. Draping for Apparel design – Hellen Joseph.
3. The Art of fashion Draping – Fairchild Books.

APPENDIX – AZ64

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

Bachelor of journalism and mass Communication

(CBCS - Colleges)

I SEMESTER:

	Components	Hours	Credits
Part I	Tamil/ Other Language	6	3
Part II	English	6	3
Part III	Core Subject THEORY- INTRODUCTION TO MASS COMMUNICATION THEORY- INTRODUCTION TO JOURNALISM PRACTICAL- COMMUNICATION SKILLS	8 2	8
	Allied THEORY- COMPUTER APPLICATIONS FOR MASS MEDIA- I	4 2	6
Part IV	ENVIRONMENTAL STUDIES	2	2
	Total	30	20

II SEMESTER:

	Components	Hours	Credits
Part I	Tamil/ Other Language	6	3
Part II	English	6	3
Part III	Core Subject THEORY- REPORTING SKILLS THEORY- PRINT MEDIA PRODUCTION PRACTICAL- JOURNALISTIC SKILLS	8 2	10
	Allied Subject I THEORY – EDITING FOR PRINT MEDIA PRACTICAL- COMPUTER APPLICATIONS FOR MASS MEDIA -II	4 2	6
Part IV	Value Based Education	2	2
	Total	30	24

III SEMESTER

	Components	Hours	Credits
Part I	Tamil/ Other Language	6	3
Part II	English	6	3
Part III	Core Subject THEORY- INTRODUCTION TO ADVERTISING & PUBLIC RELATIONS	4 2	4
	Allied Subject –II BASIC PHOTOGRAPHY	4 2	4
Part IV	Skill Based Subject THEORY – BROADCAST JOURNALISM	4	4
	Non-Major Elective Theory – FREELANCE JOURNALISM	2	2
	Total	30	20

IV SEMESTER

	Components	Hours	Credits
Part I	Tamil/ Other Language	6	3
Part II	English	6	3
Part III	Core Subject THEORY- WEB JOURNALISM Practical – WEB JOURNALISM	4 2	6
	Allied Subject Theory – TRANSLATION Practical's- TRANSLATION	4 2	6
Part IV	Skill Based Subject THEORY – BASICS OF CAMERA, LIGHTS AND SOUND (OR) BUSINESS JOURNALISM	4	4
	Non-Major Elective Theory – PHOTO JOURNALISM	2	2
Part V	Extension Activity		1
	Total	30	25

V SEMESTER

	Components	Hours	Credits
Part III	Core Subject THEORY- MEDIA RESEARCH THEORY- INDIAN CONSTITUTION AND PRESS LAWS PRACTICAL- MEDIA RESEARCH LAB PRACTICAL - INDIAN CONSTITUTION AND PRESS LAWS LAB	8 6 2	8
	Elective THEORY – GENDER AND MEDIA THEORY – MAGAZINE JOURNALISM	10	10
Part IV	Common Skilled based subject Theory – Personality Development	4	4
	Total	30	22

VI SEMESTER

Components	Hours	Credits
Part III Core Subject THEORY- DEVELOPMENT SUPPORT COMMUNICATION THEORY- MEDIA CULTURE AND SOCIETY THEORY- MEDIA MANAGEMENT PRACTICALS- WEB BLOGGING PRACTICALS- CURRENT AFFAIRS PRACTICALS- FINAL PROJECT	12 5 6 2	24
Elective THEORY – NEW MEDIA TECHNOLOGIES	5	5
Total	30	29

III SEMESTER

CORE SUBJECT-

THEORY- INTRODUCTION TO ADVERTISING & PUBLIC RELATIONS

- UNIT I:** Advertising - Role - elements - Advertising in marketing mix - types of advertising - merits and demerits - advertising and consumers - buying systems - target plans.
- UNIT II:** Advertising campaign - Ad copy - Structure - message - appeals - levels of feedback. Media planning - developing media objectives - media budget - selection of media - Implementing media plans - pre-testing and launch - advertising research.
- UNIT III:** Advertising agency - structure and functions - departments - functions - role - nature - Special emphasis on writing and visualizing. Ethical issues in advertising - advertising production techniques - print - radio - TV and Films.
- UNIT IV:** Principles of public relations, the process of public relations, tools of public relations
- UNIT V:** Crisis management and public relations - role of press relations in public relations

References Books:

1. J. Thomas Russell Ronald Lane Kleppner's Advertising procedure (11th Edition)
2. William wells, John Burnett, Sandra Mariarty Advertising Principles & Practice
3. H. Stasfield Advertising Management Handbook
4. J.V.Vilaniyam, A.K. Varglege Advertising Basics - A resources guide for beginners
5. Basic Advertising by Donald W. Jugenheimer (Paperback - Mar 1991) Advertising Procedure
6. Advertising Media Planning by Jack Z. Sissors and Roger Baron (Hardcover - Jun 15, 2002)
7. Philip Lesely, Hand Book of Public Relations and Communication
8. June A.Valladares Public Relations in India

Allied Subject:

THEORY- BASIC PHOTOGRAPHY

- UNIT I:** What is a Camera? Parts of a Camera, Camera Care, Major Types of Cameras, How to Hold a Camera, Autofocus Points, Camera's Light Meter
- UNIT II:** Camera Controls- Shutter Speed, Aperture, Preset Camera Modes, Camera Accessories- lens, tripod, flash
- UNIT III:** Composition-Rule of Thirds, Depth of Field, Centering Your Subject, Horizontal vs. Vertical, Point of View, Leading Lines, Natural Frames,
- UNIT IV:** Lighting and Color-Photography Lighting, Understanding Exposure, Reflectors, Fill Flash, Color in Photography

UNIT V: How to Create a Partial Color Photo, How to Add Texture to Photos with Layers, How to Create a Vignette, The Orton Effect - Turning Your Photos into Fairytales, How to Use Levels, How to Use Layers, How to Create a Sepia Photo, How to Sharpen a Photo

Reference Books:

1. Langford's Basic Photography: The Guide for Serious Photographers- By Michael Langford, Anna Fox, Richard Sawdon Smith
2. The Digital Photography Book, Scott Kelby, Peachpit Press
3. Basic Photography-John Hedgecoe, Collins & Brown, 2006
4. Starting Photography-Michael J. Langford, Focal Press, 1999

Skill Based Subject

THEORY – BROADCAST JOURNALISM

UNIT I: Radio broadcasting – Types of propagation- AM, SW and FM – History of radio – Radio in India – Characteristics of radio medium – Fundamentals of radio production – Audience – Target audience AIR and Public Service Broadcasting – Commercial broadcasting of AIR and Vividh Bharati – Local radio – Community radio – Private commercial radio.

UNIT II: Scripting & producing radio programmes – Writing for sound – Duration – Quotation marks – Scriptwriting, editing scripts & producing talks, discussions, interviews, dramas – Music production – OB programme productions – Running commentaries- sports and non-sports – Documentary / Feature – Radio magazine – Phone In Programmes – Special audience programmes – Live programmes – Radio in formal and non-formal education – Radio in development – Documentation – Errors and emergencies – Feedback – Listeners' letters.

UNIT III: History of Television in India; Scope of Television Journalism; TV Newsroom; News Editor; Producer; TV Correspondents; Techniques of writing TV News; TV News Production; Anchoring; Use of Clippings; TV Interview; Basic Principles of Camera Work; Live Coverage through Satellite; Effects of Television on Society.

UNIT IV: Outside Coverage; Television Documentaries; News Magazines and Talk Shows; Ethical Problems; Field Research; Interviewing; Pre-Production- Need of Balanced Presentation and Selection of Topics

UNIT V: Cable TV; Satellite Channels and its effects on Society; Television and Video Editing; Use of software; Soap Operas; Other Entertainment Programmes.

References Books

1. Broadcast Journalism: An Introduction to News Writing: Mark W. Hall
2. Handbook of Broadcasting: Abbot and Rider
3. Newswriting for Broadcast: Ed Bliss
4. Broadcast News Producing: Brad Schultz
5. Radio and Television: K.M. Srivastava

6. This is All India Radio: U.L. Barua Creative Radio Production: Bruce Siegel, Focal Press, 1992.
7. Modern Radio Production: Carl Hausman et al., Thomson Wadsworth, 2007.
8. Radio Programme Production: Richard Aspinall, UNESCO, 1971
9. Techniques of Radio Production: Robert Mc Leish, Focal Press, 2005.

Non-Major Elective:

THEORY- FREELANCE JOURNALISM

- UNIT I:** Journalism, Meaning, Definition & Scope, Different types of Journalism, Journalism as Communication tool.
- UNIT II:** Concept of News, News – Definitions, Types of News, Elements of News, News Sources, News Values, Major News Agencies: Reuters, AP, AFP, TAAS, UNI, PTI, ANI
- UNIT III:** Concept of Reporting, Types of reporting, Reporting Skills, Role and Responsibilities of a Reporter / Correspondent, Classification of Reporter, Qualities of a Reporter
- UNIT IV:** News Writing, Feature Writing, The art of Reviewing, Columns Writing, Article Writing.
- UNIT V:** Editing – Principles, Tools & Techniques, Art of Proof Reading and Copy Editing, Salient Features Of Newspapers, Magazines, Editing of Articles, Features & Other Stories, Editing Copies of News Agencies, Civil Society & Citizen Journalism.

Reference Book:

1. News writing: George.A.Hough,Boston Hough mifflin company.
2. News culture: Allen Stuart,Buckingham open university press.
3. Modern Journalism and News writing: Savita Chadda.
4. Basic Journalism: Rangaswami Parthasarathi,Macmillan India Ltd.
5. Principles of Journalism: Prabhakar Pandey, popular prakashan ,Bombay.

IV SEMESTER

CORE SUBJECT-

THEORY - WEB JOURNALISM

- UNIT I:** Internet as a medium of communication: History and evolution of internet, Understanding basics of internet technology
- UNIT II:** Features of web journalism, hypertext, multimedia, online aesthetics-content, design, colors, font, templates, navigation and hyperlinks.
- UNIT III:** Annotative reporting and strengths and limitation; participatory journalism; portals; blogging, podcasting, webcasting, micro blogging, Writing for the web: teasers, articles, links and more
- UNIT IV:** Applying multimedia elements: video, audio, slide shows, Internet and governance; culture, subjectivity and net; cyber crime and regulations
- UNIT V:** Technical writing - definition and types; objectives in technical writing; guidelines for effective writing - prewriting, writing and re-writing.

Reference Books:

1. Journalism Online, Mike Ward, Focal Press
2. Web Journalism: A New Form of Citizenship? Garrett Monaghan, Sean Tunney, Sussex Academic Press
3. Citizen Journalism: Global Perspectives, Stuart Allan, Peter Lang.
4. Making Online News: The Ethnography of New Media Production, Chris A. Paterson, Peter Lang, 2008
5. Convergent Journalism, Stephen Quinn, Peter Lang, 2005

CORE PRACTICAL: WEB JOURNALISM

1. Students need to analyze media websites: design, usability, interactivity
2. Students need to create a wiki to explain a concept in science,
3. Students need to create online PowerPoint presentations with opportunity for peer review
4. Students need to create a performance, e.g. science show for children on You Tube; radio show on science topic for public
5. Students need to create a webzine or science story
6. Students need to create & promote an online event or product
7. Student need to creates a blog and promotes online with number of readers and comments monitored

Allied Subject

Theory – TRANSLATION

- UNIT I:** Translation: nature and functions – importance of translation – types of translation – literal and free, partial, total and restricted – constraints imposed by socio – cultural contexts – barriers
- UNIT II:** Basic translation techniques: omission, addition, transposition, substitution, compensation (making up for losses in translation), concretization, generalization, antonymic translation, and metonymic translation. Text integration (analysis and synthesis at different levels of translation).
- UNIT III:** Translation and the mass media - Translating for the media – Translating news reports – advertisements – screen plays – scripts for radio and T.V – Basic principles of subtitling
- UNIT IV:** Process of translation – Paraphrase, Transference, Trans-creation, and Transliteration – Interpreting - Translating speeches – translating literature on consumer products – technical writing. Concept of equivalence – linguistics, textual and cultural
- UNIT V** Translation and comparative literature – Translated text versus the original text - Computer aided translation – machine translation – scope and limitations

References Books:

1. Altman, H. Janet. Teaching Interpreting: Study and Practice. CILT Publications, 1987.
2. A guide to writing about literature, Barnet, Sylvan and Cain, William E, New Delhi, Pearson, 2006
3. Approaches to Translation, Peter New Mark,, New York, Perganon Press, 1985
4. Baker, Mona. Editor. Routledge Encyclopedia of Translation Studies. 2001.
5. Bell, Roger T. Translation and Translating. UK: Longman Group Ltd., 1994.
6. Biguenet, John and Rainer Schulte. Editors. The Craft of Translation (Chicago Guide to Writing, Editing and Publishing). University of Chicago Press, 1989.
7. Bassnett, S. & Bielsa, E. Translation in Global News. London: Routledge, 2009.
8. Catford, J. C. A Linguistic Theory of Translation. 1965.
9. The theory and practice of Translation, Turber and Nida, E.J.Brill, Leidew, 1974
10. Translation and Interpretin: Reader and Workbook/ Anuvad evam Bhashantaran: Path aur Abhyas, edited by Ravinder Gargesh and Krishna Kumar Goswami (Delhi: Orient Longman, 2007)

Practical's- **TRANSLATION**

Practical work

1. Translations of texts of human interest stories from English to Tamil and vice versa
2. Subtitles for a film – from English to Tamil and vice versa
3. Translation of television news to text form - from English to Tamil and vice versa
4. Translation of a short story – from English to Tamil and vice versa
5. Translation of an interview from English to Tamil and vice versa

Overall activities

- Translating texts from English to Tamil and vice versa. Discussing the problems arising out of the above activities.
- Examining texts in translation (including multiple translations of the same text) and comparing and contrasting them and suggesting improvements.
- Study the presentation style of a news report which is reported in both the English and Tamil dailies.
- Exercises or role plays including simultaneous and consecutive oral translation.
- Using reference materials such as dictionaries, encyclopedias, thesauruses, glossaries, translation software, etc.
- Using modern technology for translation and interpreting.

PART IV:

Skill Based Subject **BASICS OF CAMERA, LIGHTS AND SOUNDS**

THEORY –

- UNIT I:** **Camera-** Introduction to video camera, Parts of video camera and their functions, Camera movement equipment, Lenses – functions and types
- UNIT II:** **Visualization-** Composition – different types of shots, camera angles and camera movements, Aesthetics in visual composition, Subject - camera relationship, Aperture control and depth of field
- UNIT III:** **Lights-** Lights and its properties, Different types of lights, Other tools used in lighting – diffusers, reflectors, cutters & gels, Basic lighting techniques, Accessories used in lighting
- UNIT IV:** **Sound-** Audio fundamentals, Various audio elements used in video programmes - lip synchronized sound, voice, music, ambience, sound effects, Types of microphones

Use of audio mixers for recording & editing of sound, Different audio equipment for studio and location recording, Audio post production – mix and unmix tracks

UNIT V: **Editing-** Aesthetic Factor of Audio& Video editing, Types of AV editing- Non-Linear editing ,Cut to cut, assemble & insert, on line, offline editing, Designing, Evaluation and field testing of programme

Reference Books:

1. Ralph Donald, Thomas Spann Fundamentals of TV Production, Surjeet Publications, New Delhi
2. Herbert Zettl TV production Handbook, Thomas Wardsworth Publishing

THEORY – BUSINESS JOURNALISM

UNIT I: A foundational course on economics, covering all major schools of modern economic thinking - Classical, Neo-classical, Marxian, Keynesian and Monetarist

UNIT II: Institutional framework of modern economy, covering the institutions, which play a key role in shaping economic policies as well as implementing them at the national and the global levels - Emergence of Breton Woods Institutions, GATT and WTO, United Nations agencies like Unctad, Unido and ILO, Planning Commission of India, Ministry of Finance and Commerce and Planning Boards at the state level

UNIT III: Milestones of Indian economy - Brief account of Indian economy on the eve of independence, process of the finalization of first five-year plan, general overview of Nehruvian model, bank nationalization, green revolution, control and permit raj and liberalization of the 1990s

UNIT IV : Business reporting and editing - corporate reporting; banking; policy-making institutions;market reporting -stock market, currency exchange markets and commodity markets; regulatory bodies; company law; budget; trade policies

UNIT V: Business newspapers, magazines, news agencies and television channels - A straight narrative on business dailies and magazines in the country as well as abroad - Wall Street Journal, Financial Times (London), The Economic Times, The Financial Express, Business Line, Economist, Fortune, Outlook Money, Outlook Business, Business Today, Business World and Business India; 24x7 television channels dedicated to business – CNBC, NDTV,Profit and others; financial and data service wire agencies - NewsWire18, Reuters, Bloomberg, Dow Jones and others.

Reference Books:

1. Adam Smith, Wealth of Nations
2. Karl Marx, Das Capital
3. John Maynard Keynes, General Theory of Employment, Interest and Money
4. Joseph Schumpeter, Capitalism, Socialism and Democracy

Non-Major Elective

THEORY – PHOTO JOURNALISM

- UNIT I:** Photography – elements and principles – visual meaning photographer’s jargon, Composition of photography – subject and light.
- UNIT II:** Photographic equipment – cameras – types formats – lens – their types and functions, film-types and functions – accessories.
- UNIT III:** Shots- focus shutter-speed selection of subject different types of photographs action-photo editing – procedure-pictures for newspapers and magazines developing photographer’s manual and computerized photography.
- UNIT IV:** Photographing people, portrait and still, wildlife, environment, sports, landscape, industrial disasters, photography for advertising, conflicts war political and social photography.
- UNIT V:** News values for pictures, photo essays – photo features; qualities essential for photo journalism, picture magazines – colour photography, impact of technology, practical, field assignments and their evaluation.

Reference Books:

1. Martin Lister, The photographic image in digital culture, Routledge, 1995
2. John Hedgecoe, John Hedgecoe’s Basic Photography Collins and Brown, 1993
3. John Freeman, Practical Photography, Smithmark, 1995
4. Photography Techniques, Marshall Cavendish, 1992

PART V : EXTENSION ACTIVITY V SEMESTER

CORE SUBJECT

THEORY - MEDIA RESEARCH

- UNIT I:** **Research and its Designs:** Meaning, objectives and types of research, Research Approaches – quantitative and qualitative, Research Process – the steps involved Research Design –
- UNIT II:** **Sampling:** Meaning and different types, Sampling – Selecting a sample, types of sampling – Probability and Non- Probability, Hypothesis /Research Questions

- UNIT II:** **Data Collection:** Primary and Secondary data, Observation method, Interview method, Collection of data through questionnaire, Collection of data through schedule, Content Analysis, Case Study Method
- UNIT III:** **Survey:** Survey – Meaning, Characteristics and types, Public opinion surveys, TRPs, Readership survey, IRS, NRS, Election related survey – opinion poll and exit poll
- UNIT IV:** **Data Analysis and Report Writing:** Writing a proposal, synopsis, abstract for a project. Processing of data – editing, coding, classification, tabulation, Measures of central tendency – Mean, median and mode, Analysis and interpretation of data Report writing – parts of a report, steps involved, Measuring impact, evaluation, monitoring and feedback

Reference Books:

1. C.R. Kothari Research Methodology: Methods and Techniques, Wishwa Parkashan, New Delhi
2. S.R. Sharma & Anil Chaturvedi Research in Mass Media, Radha Publications, New Delhi
3. G.R. Basotia & K.K. Sharma Research Methodology, Mangal Deep Publications
4. Sadhu Singh Research Methodology in Social Science,, Himalaya Publishing House, Mumbai
5. Dr. S. Munjal Research Methodology, Raj Publishing House, Jaipur.

THEORY- INDIAN CONSTITUTION AND PRESS LAWS

- UNIT I:** Indian Constitution: Preamble - Salient features - Fundamental rights - fundamental - Duties - Directive principles of state policy – Citizenship - The Union and State Government - Parliament- privileges, Functions
- UNIT II:** Freedom of the press and the Constitution-need for a free press in a democracy - Article 19(1)(a) of the Indian Constitution-Freedom of speech and expression - reasonable restrictions to freedom of the press - Press laws before and after Independence - Press Commissions - National Emergency
- UNIT III:** The Press Council Acts - Composition, role, powers, guidelines and functions of the Press Council, The Law of Copyrights - TRIPS and TRIMS, The Contempt of Courts Act, 1971, The India Penal Code, Sections 124-A, 495, 496, to 501, The Criminal Procedure Code, Sections 108, 144, The Indian Telegraph Act –
- UNIT IV:** Right to Information Act 2005 - Information Technology Act , Laws of Human Rights - Child Labor Acts - Women’s Rights, Cyber Laws - Cable Act
- UNIT V:** Emergence of electronic and new media law - The AIR Code - The Commercial Code of AIR & Doordarshan - Cable Television Act and Rules - Advertising Standards Council of India - Media regulation

Reference Books

1. Laws of the Press in India - Durga Doss Basu -1987
2. Press and the Law - DK Umrekar
3. Laws of the Press - Dawson
4. Constitutional law of India (updated every year) - J. N. Pandey
5. Reports on Consumer Rights, Human Rights and draft report of the IT ACT.
6. Relevant Sections of IPC from Criminal Law Manual, Universal
7. Constitution of India (Article 19 (1) and 19 (2) 105, 194)The Law Dictionary, Universal
8. Vidisha Barua Press & Media Law Manual, Universal Law, Publishing Co. Pvt. Ltd. New Delhi
9. P.K. Ravindranath Press Laws and Ethics of Journalism, Author Press, New Delhi
10. R.K.Ravindrana, Press in the Indian Constitution
11. K.S. Venkateshwaran, Mass Media Laws and Regulations in India, Published by Asian Mass Communication Research and Information Centre, Distributed by N M Tripathi Pvt. Ltd. Bombay
12. Dr. Ambrish Saxena Freedom of Press and Right to Information in India, Kanishka Publication, New Delhi

PRACTICAL- MEDIA RESEARCH LAB

Exercises/Assignments

1. Using any of the research technique students will conduct media research culminating into hard and soft copies of the report.
2. Following studies will have to be conducted by the students who will prepare the reports based on the study :
 - i. Preparing the research design
 - ii. Conducting a survey – preparing questionnaires and schedule
 - iii. Analysis of any media context
 - iv. Measuring media effects and media agenda
 - v. Pre-testing/evaluation tools for audio-video, print, publicity material
 - vi. Writing the report

PRACTICAL - INDIAN CONSTITUTION AND PRESS LAWS Practical work- Submit a record which should contain

- Analysis of crime news reports of print media with press council norms
- Ad analysis with the standards of ASCI
- Case studies of contempt of court and defamation

- Rewriting of news reports adhering to legal standards and norms
- Interviews with reporters in field on ethical concerns in reporting

Overall activities

- Discussions on the ethical standards
- Examining ethics in news reports on social issues

ELECTIVE

THEORY- GENDER AND MEDIA

- UNIT I:** Understanding gender – social construction of gender – its implications – gender based discrimination – gender equality and development - The Status of women in India changing dimension from ancient to modern times
- UNIT II:** The women's right as human rights – Beijing conference and changing scenario regarding women's development - Women's developments movements from Raja Ram Mohan Ray to Dr. B. R. Ambedkar. The Study of present women movements with reference to India & Maharashtra - Women and Politics
- UNIT III:** Women and concepts of beauty in media – advertising industry – commercialization and its implications. Commodification – Objectification – Male gaze – Body image disturbances and influence of media on women in society
- UNIT IV:** Women in media – representation of women in media at different levels – Teleserials – Stories, Cartoons and Women Magazines and Supplements - Stereotypical portrayal - Treatment of violence against women in media - Ethical issues and code of conduct -, Violence against Women, Mass Media Images of Women
- UNIT V:** Gender sensitive policy perspectives for development, National policy for empowerment of Women - Mass Media and Women's Empowerment, Health and Women's Empowerment, Environment and Sanitation, Education, Employment and Women Empowerment, Strategies – strengthen role of women as decision makers in media.

Reference Books:

1. Bhasim K: Women and media – Analysis alternatives and action New Delhi.
2. Butlet Matilda: Women and mass media, New York, Human science press, 1980.
3. Unequal opportunities the case of the women and media Paris UNECO, 1981 - Gallagher– Margret.
4. ICSSR : Status of women in India : A Synopsis of the Report of the National committee on the status of women (1971-74). Allied publishers, 1975.

THEORY- MAGAZINE JOURNALISM

- UNIT I:** A brief history of magazine journalism, global scenario and current trends in magazine journalism in India; magazine journalism versus newspaper journalism
- UNIT II:** Types of magazines- general interest magazines, special audience magazines, public relations magazines, literary magazines, Sunday magazines and journals; online magazines- e-zines,web-zines, web-edition magazines; a review of leading general interest magazines in English and Tamil
- UNIT III:** Organizational structure of a magazine – editorial, advertising, circulation, promotion and business departments; reporting and editing operations in a magazine; magazine journalism terminology
- UNIT IV:** Cover and cover story – functions of the cover- cover design formats – coverblaze - coverlines; contents page; cover story selection criteria: length, strength, importance, promotability and illustratability.
- UNIT V:** Magazine articles- features, film reviews, book reviews, profiles, columns, cartoons, regulars and fillers. Magazine Design –format, layout, typography, colour, photos, illustrations, infographics and blurbs .

Reference Books

1. Feature and Magazine Writing – David E. Sumner & Holly G. Miller, Surjeeth Publications(2006)
2. The Art of Feature Writing – Humed Contractor, Icon Publications Pvt. Ltd.(2004)
3. Inside the Writer’s Mind – Steephan G. Bloom, Surjeeth Publications(2004)
4. Writing for Magazines – Jill Dick, Unistar Books(2004)
5. Magazine Editing – John Morrish, Routledge (1996)
6. The Language of magazines – Linda mcloughlin, Inter Text.(2001)
7. Handbook of magazine article writing – Michelle Ruberg, Writer’s Digest(2005)
8. Magazine Journalism Today – Antony Davis, Heinemann professional publishing (1988)

VI SEMESTER

Core Subject

THEORY- DEVELOPMENT SUPPORT COMMUNICATION

- UNIT I:** Key concepts in Development, Processes and indicators of development – development communication concept and Scope.
- UNIT II:** Development support communication in India - Towards an understanding of holistic social development, empowerment of the people – health, education, poverty, hunger, agriculture, environment, gender equality, social justice and other development related issues.

- UNIT III:** Evolution of the Theory and practice of Development Communication- Development and social change - Models of development communication - International and Indian models.
- UNIT IV:** Critical perspectives on Communication and Development: Dominant paradigm of development, modernization approach, and information and communication technologies for rural development.
- UNIT V:** Communication for Social change- role of a communicator in the process of social change. Folk forms, Third theatre and other alternative media for social change.

References Books

1. Srinivas R. Melkot & H. Leslie Steeve, Communication for Development in the Third World- Theory and Practice for Empowerment, Sage Publication, New Delhi, 2001.
2. Maglaland Demetrio (Ed), From the Village to the Medium – An Experience in Development Communication, Communication for Asia, Philippines, 1976.
3. Desmond A. D’Abreo, Voice of the People – Communication for Social Change, Culture and Communication, Madras, 1990.
4. Augusto Boal, Theatre of the Oppressed, Pluto Press, 1979.
5. Durga Das Mukhopadhyay, Folk Arts and Social Communication, Publication Division, New Delhi, 1994.

THEORY- **MEDIA CULTURE AND SOCIETY**

- UNIT I:** Why study media? Understanding mass media. Characteristics of mass media. Effects of mass media on individual, society and culture-basic issues. Power of mass media. Media in Indian society. Definition, nature and scope. Function of mass media. The definitions of society – Central issues for understanding society, caste, language, family, religion – Essential elements of society – social stratification in India
- Unit II:** The definitions of culture – the characteristics of culture – components of culture – functions of culture – cultural diffusion. Media as consciousness Industry. Social construction of reality by media. Rhetoric of the image, narrative etc. Media myths (representation, stereotypes etc.) -
- Unit III:** Media Audience analysis (mass, segmentation, product etc, social uses). Audience making. Media saturation – media influence – The manufacturer and management of information – media education and democracy – increasing importance of visual communication – the growing of privatization of information

Unit IV: Media pedagogy – How not to study media – The media as agents of cultural transformation – the media as popular art forms – the media as aids to learning – the media as agents of communication

Unit V: Ownership and control – media institutions – state and the law – media self regulation and control – economic determinants – advertisers – audiences – media personnel – sources

Reference Books

1. Alvarado, Gutch and Wollen, Learning the media, Macmillan Education Ltd, 1987
2. Len Masterman, Teaching the media, Comedia Publishing Group, London, 1985
3. Tim O’Sullivan and Brian Duttar, Studying the Media – An introduction, Arnold, London, 2003
4. Grame Burton, Talking Television, Vikas Publishing House, New Delhi, 1982
5. Sean McBride, Many Voices, One World, UNESCO, New Delhi, 1982
6. David Barrat, Media Sociology, Tavistock Publications, London, 1986
7. Potter, James W (1998) Media Literacy. Sage Publications
8. Grossberg, Lawrence et al (1998) Media-Making: Mass Media in a popular culture. Sage Publications
9. Berger, Asa Authur (1998). Media Analysis Technique. Sage Publications

THEORY- MEDIA MANAGEMENT

UNIT I: Media Management: Concept and Perspective, Concept of management, Classical and modern school of management, Functions and Principles of good management, Origin and growth of media management, Development of media organizations as an Industry in India, Media management in the global scenario, Political economy and media industry

UNIT II: Media Industry –An overview, Media industry as manufacturers(content and consent),Ownership patterns in India, Characteristics of media industries, Consolidation and convergence, Mission and vision of Media Organisations, Structure of newspaper organizations, news agencies, magazines, Radio and TV., Functions of various departments of these media organizations, Media audiences and credibility, Media Management Models, Government-Media Interface- Policies and regulations

UNIT III: Media Economics and Marketing, Financial Management and budgeting, Sales, Marketing and Market analysis, Developing strategies for product, promotion, pricing, penetration and distribution. Sources of revenue-circulation and advertisements. Problems of finance. Market Position of performance evaluation (TAM, TRP and HITS), Problems of finance

UNIT IV: Entrepreneurship, Media managers and workforce, Arranging equipment and personnel for a new media enterprise, Personnel management in media

organizations, Qualities and Functions of media managers, planning and goal setting, Entrepreneurial freedom and challenges, Unionism in media companies, Concepts of Leadership and motivation in the media

UNIT V: Media management: Insights, Practices and challenges, Legal, ethical and Social responsibility in Media management, Case studies of Media organisations.

Reference Books:

1. Media Management in the age of Giants-Dennis F. Herrick(Surjeet Publications)
2. Media Industries-History, Theory and Method(Edited By- Jennifer Holt and Alisa Perren)(Wiley- Blackwell)
2. Managing Media Organisations-John M. Lavine and Daniel B. Wackman
3. Newspaper Management- Gulab Kothari
4. Making News- Uday Sahay
5. Management of Electronic Media- Alan B. Albarran
6. Strategic management in media – LucyKung, SAGE
7. Marketing Of Newspapers - Padmaja R, Kanishka Publishers Distributors
8. The Fundamentals Of Marketing, Edward Russell, Ava Publishing

PRACTICALS- WEB BLOGGING

Every student is required to set up a publicly accessible blog using a free hosting service like Blogger.com or WordPress.com. Post appropriate content to the blog

Provide the following information:

- Title of your blog
- URL of your blog
- Report of traffic tracking mechanism used
- Snap Shot of the front page of your blog

PRACTICALS- CURRENT AFFAIRS

During the course of the semester each student will be required to do an in-depth study of a topic and present it as a seminar.

- Seminar presentations on topics assigned by the teacher.
- Students should also submit individual assignments on these topics.
- The Final presentations should be made in the presence of the class, the teacher concerned and at least one more teacher/ expert.
- Marks to be allotted to the student in continuous internal evaluation by the teacher as well as on the final presentation in the presence of the expert.

PRACTICALS- FINAL PROJECT

Every student will be assigned the Final Project at the end of the Fifth Semester. The Final Project will be pursued by him/her under the supervision of an internal supervisor in the Sixth semester. The student will make his/her final project on the subject/theme approved by the Director of the Institute/HOD in the fifth semester. The Project Reports (induplicate) both hard & soft copy will be submitted by the students at least four weeks

prior to the date of commencement of the End-Term Examination of the Sixth Semester. At the time of viva, the students will make a Power Point Presentation of the Final Project.

Elective

THEORY – NEW MEDIA TECHNOLOGIES

- UNIT I:** **Introduction to New Media-** New media- Meaning and characteristics
Interactivity and New Media, Economics of New Media,
- UNIT II:** **New Media Technologies and Applications-**Digitization of media- media
convergence.Encoding and compression standards.,Telecommunication- 3G,
4G,Production for the internet and mobile, Online broadcasting technologies-
webcasting, podcasting, online radio.,Satellite radio and satellite
- UNIT III:** **New Media and Governance-**E-Governance; Innovations in E-Governance,New Media
and National Security, New Media as Surveillance Technology,New Media Laws and
Regulatory Frameworks
- UNIT IV :** **New Media and Social Change-**Community Informatics,Open Source
Approaches,Activism in Cyber space, ICT's and Gender; ICT and Social Inclusion,
- UNIT V:** **New Media and Social Life-** Net -worked Societies,Speed and Social Life
Social relationship and Identity - Online and Offline,Concepts of Virtuality; Post- Modern
Virtualities, Ideas of Virtual Space Vs Real Space, Youth and Social Networking, Ethical
issues with Social Networking, Globalisation and Emerging Cyber Cultures

Reference Books:

1. Hand Book of New Media by Lievrouw and Livingston, Sage (Student Edition)
2. Kahn, R and D Kellner, "New Media and Internet Activism: From The Battle of Seattle to Blogging' New Media & Society, Vol. 6, No. 1, 87-95 (2004)
3. Feenberg A. and M. Bakardjieva, (2004)."Virtual community: No killer implication" New Media and Society Vol 6(1): 37-43.
4. Castells, Manuel (2004) The Network Society: a cross-cultural perspective, Edward Elgar, MA
Gill, S.S (2004) India's Information Revolution: A Critique; Rupa, Delhi, 2004.
5. Lewis Peter M. and Jones, Susan, " From the Margins to the Cutting Edge: Community Media and Empowerment", (eds.) (2006) Cresskill, NJ: Hampton, 256 pp
6. Van Dijk, J. A. G. M. " The Network Society : Social Aspects of New Media", Sage Publications, 2005
7. Jal Chitra, Water Map: Soft ware for Rural Water Management by Vikram Vyas from Shaping Technologies Sarai Reader 03 (page 292-296)
8. The Face of The Future: Biometric Surveillance and Progress by Rana Das Gupta in The Cities of Everyday Life, Sarai Reader 02 (page 290-296)

APPENDIX – AZ65**MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI**Course Structure for ***B.Sc Visual Communication***

under CBCS (Common Course Structure for B.C.A, B.Sc. Comp.Sci., is adopted)

Scheme of Examination 2012-2013 Onwards

I SEMESTER:

	Components	Hours	Credits
Part I	Tamil/ Other Language	6	3
Part II	English	6	3
Part III	Core Subject THEORY-INTRODUCTION TO VISUAL COMMUNICATION PRACTICAL –VISUAL LITERACY	6 4	8
	Allied THEORY- COMMUNICATION SKILLS	4 2	4
Part IV	Environmental Studies	2	2
	Total	30	20

II SEMESTER:

	Components	Hours	Credits
Part I	Tamil/ Other Language	6	3
Part II	English	6	3
Part III	Core Subject THEORY- VISUAL DESIGN PRACTICAL- DRAWING	6 4	8
	Allied Subject I THEORY – DESK TOP PUBLISHING PRACTICAL- DTP PRACTICAL'S	4 2	4
Part IV	Environmental Studies	2	2
	Total	30	22

III SEMESTER:

	Components	Hours	Credits
Part III	Core Subject THEORY- PHOTOGRAPHY THEORY- ADVERTISING PRACTICAL- PRACTICAL PHOTOGRAPHY	12 6	2
	Allied- THEORY- AUDIOGRAPHY	4 2	2
PART IV	Skilled based Subject I THEORY- WRITING FOR MEDIA	4	4
	Non Major Elective THEORY- BASIC PHOTOGRAPHY	2	2
	Total	30	22

IV SEMESTER

	Components	Hours	Credits
PART III	Core Subject THEORY- TELEVISION PRODUCTION PRACTICAL- TELEVISION PRODUCTION PRACTICAL'S	6 6	8
	Major Elective THEORY- FUNDAMENTALS OF JOURNALISM	6	5
	Allied- THEORY - WEB DESIGNING PRACTICAL - WEB DESIGNING PRACTICALS	4 2	4 2
PART IV	Skilled based Subject THEORY- VIDEO EDITING (or) Public Relations	4	4
	Non Major Elective THEORY- VIDEOGRAPHY	2	2
PART V	Extension Activity		1
	Total	30	26

V SEMESTER

	Components	Hours	Credits
PART III	Core Subject THEORY- FILM STUDIES THEORY- MEDIA LAWS AND ETHICS PRACTICAL - SHORT FILM PRODUCTION PRACTICAL - COMPUTER GRAPHICS -2D	8 8 4	16
	Major Elective THEORY- MEDIA CULTURE AND SOCIETY	6	5
PART IV	Common Skilled based Subject THEORY- Personality Development	4	4
	Total	30	25

VI SEMESTER

	Components	Hours	Credits
Part III	Core Subject THEORY- ANIMATION AND GRAPHICS THEORY- MEDIA MANAGEMENT THEORY- BASICS OF MEDIA RESEARCH Practical's- TELEVISIONS COMMERCIAL PRODUCTION Practical's- COMPUTER GRAPHICS -3D	12 12	20
	Project/Elective VIDEO DOCUMENTARY & INTERNSHIP	6	5
	Total	30	25

MANONMANIAM SUNDARANAR UNIVERSITY
B.Sc. DEGREE COURSE IN VISUAL COMMUNICATION
CHOICE BASED CREDIT SYSTEM
(w.e.f. 2012-2013)

THIRD SEMESTER

Part III- Core Subject:

THEORY: PHOTOGRAPHY

- UNIT I: The principles of image capturing, the behavior of light and the history of development of photographic technology, The types of photographic machines, The use of shutter, diaphragm, selection of lens type, An understanding of f/stop, focal length, film sensitivity, exposure factors.
- UNIT II: Color temperature, Electromagnetic spectrum, Different types of light based on manufacturing and photography purpose, Light plot, Three point lighting, Five point lighting, Light meters and Light measurement units
- UNIT III: Principles of advertising photography: the role of advertising, special characteristics, studio equipment, table top photography, Exposition of studio and indoor/outdoor portrait lighting techniques.
- UNIT IV: Introduction to photogram's, photograph enlargements, contact printing, cropping, dodging, burning, movement sensation, freezing, panning, filters and photographic papers categories (conventional, variable contrast, etc)
- UNIT V: Digital photography, Image sensors - 3CCD, 3MOS, Pixels, sensitivity, Image quality, Image compression and file formats, Digital image storage devices. Editing digital photographs, Ethics of image editing,

Reference Books:

1. Martin Lister, The photographic image in digital culture, Routledge, 1995
2. John Hedgecoe, John Hedgecoe's Basic Photography Collins and Brown, 1993
3. John Freeman, Practical Photography, Smithmark, 1995
4. Photography Techniques, Marshall Cavendish, 1992

Core Subject:

THEORY: ADVERTISING

- UNIT I: Definition of Advertising Objectives, Utility, Concepts and Features, Medium of Advertising: News Papers, Magazines, Radio, Television, and Internet.
- UNIT II: Types of Advertisements- Commercial, Social, Institutional and Financial. Outdoor and Small Medium. Copy of Advertisements of Various Mediums and Their Differences.
Advertisements copy Terminology and Principles, Title, Logo Appeal, Layout etc.
- UNIT III: Advertising agency: structure and functions; Advertising Appeals, Elements of Advertising, Creativity in Advertising and Copy Writing.

- UNIT IV: Advertising as a Marketing Tool. Concept of Marketing & advertising, Marketing Mix P's in marketing, Segmentation of consumer & positioning of product
- UNIT V: Advertising – Problems of measurements – Opinion ratings – Concurrent methods – Recall, test – Recognition test – audience evaluation for various media –,Advertising code.

Reference Books:

1. Lank Jefkins, Advertising made simple, Rupa and Co., New Delhi. 1992
2. Coutland L. Bovee, John V. Thill, George P. Dovel, Marian Burk wood, Advertising excellence, McGraw Hill, Inc., N. Y. 1995
3. Thomas Russel, J. Donald Lane, W. Klepper's Advertising procedure, Prentice Hall International, Inc., New Jersey, 2002
4. Advertising Psychology and Research – Hepner
5. Advertising – Warner, et al
6. Fundamentals of advertising – Chunna wallah
7. Advertising Management Concepts & Cases – Mahendra Mohan
8. Advertising campaigns – Wright
9. Advertising Made Simple – Thomos Jefkins
10. Effective advertising – Leon Quera.

Core Subject

PRACTICAL: PHOTOGRAPHY

List of practical's to be conducted

Outdoor Photography

1. Landscape (scenic, people, birds/animals, monuments)
2. Portraits
3. Photo feature, photo language
4. Flora and Fauna
5. Silhouette
6. Freezing movement
7. Panorama
8. Montage
9. Special effects
10. B- shutter and Multiple Exposure
11. Action Photographs with slow and fast shutter speed(sports, water falls)
12. Photograph with perspective (Linear, Angular, Aerial and Parallel)

Indoor Photography

1. Passport and Group Photographs
2. Portrait
3. Product Photograph

4. Lighting - top light, key light, back light, side light, low light, fill light, diffused light, spot light, Silhouette

***Each student must submit a record with minimum of two photographs on every topic
Every photograph should be given the following details***

- Camera Make and Model
- Aperture setting
- Shutter speed
- Film speed / ISO Speed
- Lens (and its focal length)
- Compositional description

Allied Subject:

THEORY: AUDIOGRAPHY

UNIT –I What is sound-Db perception of sound-hearing sensitivity-frequency of range-sound wave length-measuring sound frequency range of various musical instruments-Echo, Reverberation, Delay and Decay-Basic set up of recording system-analog digital cables, connector, Analogue to digital conversion.

UNIT – II Microphone – types-direction, pickup pattern, noise, choosing the right mike, technique – sound reproduction devices-input devices-various sound file extension.

UNIT – III Mixing console-Accessories and connectors, cables-special effects-equalizers-digital recording software-location recording

UNIT – IV Editing techniques-audio sweetening-chorusing-noise reduction-the mastering process-computers in music technology

UNIT – V Audio dubbing for video production-synchronization time code – storage output devices-file transfer protocols-archival-Digital audio broadcast

Reference Books:

1. Strut, John Williams, Baron. The theory of sound, Rayleigh. 1996.
2. AlecNibet. The use of microphones. Oxford: Focal Press, 2004.
3. Salkin, Glyn. Sound recording and reproduction. Oxford: Focal Press, 1996.
4. Mike Collins, Choosing and Using Audio and Music software, first edition, Focal Press, 2004.

PART IV

SKILLED BASED SUBJECT

THEORY: Writing for Media

UNIT I: Storytelling: Where do stories come from? Life as a source - memory, imagination, experience - yours & others. The nature and role of intuition. Universalizing the personal experience. Importance of research. Adaptation from literary works. The difference between actually being inspired and stealing ideas.

- UNIT II: Developing ideas and Conceptualization- Visual thinking -Story writing, conflict and resolution, characterization, The 3-act structure, scenes, sequences, shot breakdown and story genre, Plot, Sub-plot Narrative structure – elements of narrative-cause and effect- Dialogue Writing.
- UNIT III: Different stages of scripting. Premise, Theme, ideology The Format: The format for writing the Synopsis, Step-outline, Screenplay and Script for a film- script formats and types of script, storyboard term used for camera movement and production problems
- UNIT IV: An introduction to screen grammar: What is a shot? The editing transitions that can be used to join two shots: Cut, Dissolve, Fade, Wipe, Bleach. The various elements of shot-taking: Image Size, Camera Angles, Movements, Lenses, Lighting, Camera Speed, Stocks, Graphics, Color The Rule of Thirds & the Golden Points. Depth of Field and Selective Focus.
- UNIT V: Script organization - target audience consideration - scripting for science/development program - scripting for educational program - scripting for women's program - scripting for commercials.

Reference Books:

1. William, Miller, Screen writing for narrative film and television, Columbus book, London, 1989.
2. Dwight swan, Film script writing, Hastings House, New York, 1976
3. Dwight San, Script writing for video an audio media, Hastings House, New York, 1976.

Non Major Elective

THEORY: BASIC PHOTOGRAPHY

- UNIT I: Introduction to camera – Working of camera- Lenses. Aperture, shutter, depth of field, film
- UNIT II: Composition of Photography, Framing the subject, Light and Form, Filters, Value of pictures, Photo feature, Photo essay; Photo journalist
- UNIT III: Digital Photography, Film Vs Digital, Photo editing software (Photoshop)
- UNIT IV: Photographing subject – People and Still Life; portrait, advertising photography, fashion photography, landscape photography, wildlife photography – equipment and accessories for special assignments
- UNIT V: Workshop: How to capture better News photographs?: Students must analyze at least six works of Indian and foreign photojournalists and based on the lesson drawn from the analysis and skills acquired during the course, a set of ten original news photographs (without image manipulation) must be submitted as record for internal valuation and viva

Reference Books:

1. Martin Lister, The photographic image in digital culture, Routledge, 1995
2. John Hedgecoe, John Hedgecoe's Basic Photography Collins and Brown, 1993
3. John Freeman, Practical Photography, Smithmark, 1995
4. Photography Techniques, Marshall Cavendish, 1992

FOURTH SEMESTER**Part III****Core Subject****THEORY: TELEVISION PRODUCTION**

- UNIT I: Introduction to television production – Video production: meaning and scope, video production process: pre production, production, post production, production personnel and their duties and responsibilities, Types of video programme production, Television studio and ENG production
- UNIT II: Introduction to video camera – Working principle of a video camera, Different types of video cameras, CCD, Components of a video camera, Types of Lenses, White balance: process and need, Camera control unit, Basic shots and their composition, Concept of looking space, headroom and walking space
- UNIT III: Lighting for Television – Importance of lighting in television, Lighting equipment and control, Lighting techniques and problems, Illumination system; inclusive of inverse square law and lux meter
- UNIT IV: Editing concepts and fundamentals – Editing – meaning and significance, Grammar of editing – Grammar of picture, Grammar of audio, eye line, point of view and continuity type – match cut, jump cut, tempo, transition, special effects, Importance of cut away and cut in shots, Editing problem and ethics
- UNIT V: Editing techniques – Criteria for editing – picture, narration and music, Editing equipment – recorder, player, video switcher, audio mixer, monitor, speaker, special effect generator, Non-linear workstation, Types of editing – assemble and insert editing, online and offline editing, cut to cut and AB Roll editing, Non-linear editing (basic software's)

Reference Books:

1. Millerson G. H. , Effective TV Production, Focal press, 1993
2. Holland P., The television handbook, Routledge, 1998
3. Zettl, Herbert, Television production handbook, wardsworth, Thompson learning, 2001
4. Multitasking for T V Production by Peter Ward
5. Studio and outside broadcast Camera work by Peter ward
6. Grammar of the edit by Roy Tohmson

CORE PRACTICAL: TELEVISION PRODUCTION

Exercises

1. Students should write original scripts for different formats like documentary, TV educational programme and short stories (Three exercises) – these should be submitted as separate record
2. Shoot any one of the above format – duration not to exceed 5 minutes inclusive of credit lines
3. Each student should do individual projects containing the record and the video program in a DVD

Final practical examination will analyze students on their ability to prepare a complete script and story board on any of the above mentioned format

Major Elective

THEORY: FUNDAMENTALS OF JOURNALISM

- UNIT I: News Basics – News definition, Elements of News, News sources, Contacts book, anonymous sources, News Value News judgment, difference between news and views, Fairness, Proximity, Timeliness, Scoop, Check calls, hard and soft news, Nose for news
- UNIT II: Beat definition, Types of Betas, beat development plan, Introduction to political beat, education beat, court beat, sports beat, business beta, environment beat
- UNIT III: Brainstorming, story idea, story mapping, deciding story angle approach, research, computer assisted research, ideas for features, creative ideas for features
- UNIT IV: 5W's 1H, Inverted pyramid structure, Hour-glass structure, language of news, precision, clarity, lead and intro, types of leads, attribution, proof reading, sub-editing, writing headlines, captions
- UNIT V: Duties and responsibilities of journalist, objectivity and subjectivity, ethics in reporting, ethical philosophies, freedom of speech and expression with reasonable restrictions, press council guidelines

Reference Books:

1. D'Souza, "Handbook of Journalism", Anmol Publications, 2000
2. Jan Johnson Yopp and Kathrine C. McAdams, Reaching audiences: A guide to media writing, Focal Press, 2002
3. H. M. Aggarwal, "Journalism in Practice", Reference press, 2005
4. Shahzad Ahmad, "Journalism News Coverage", Anmol, 2005

Allied Subject:

THEORY: WEB DESIGNING

- UNIT I: Introduction to internet , Fundamentals of internet: WWW, IP, Working of internet : networking and its classification Networking topologies, types of servers, server software, Internet protocols (TCP/IP, FTP HTTP)

- UNIT II: Language for creation of web pages:Introduction of HTML, Basic structure of HTML, creating hyperlinks, frame, form ,Web development tools: Flash, Dreaweaver, MS Publish
- UNIT III: Concept of Cyber space, Traffic jam, Structure of a web portal, Introduction to major Indian portals, web advertising
- UNIT IV: Powers and limitation of internet, Evolution of Internet language, Role of web master, application programmer and network engineer, Role of web team members: writer, copyeditor, visualizer, graphics designer, project manager, web site manager, animator, audio-video expert
- UNIT V: Techniques of web media, Editing, layout and use of pictures in web, Web publishing tools, MS publishing Wizard, Introduction to MS personal web server, FTP server, Embedding scripts in HTML documents.

Reference Books:

1. Christian Crumlish, The ABC of the internet, BPB publications, New Delhi, 1998
2. Powell Thomas, Web design: The complete reference. Tata MCGraw Hill, 2000
3. Joel Sklar, "Principles of Web Design".

ALLIED**PRACTICAL: WEB DESIGNING**

- Develop web pages in HTML incorporating tables, frames etc.
- Inserting images, audio and video clips in Web pages
- Develop web pages using MS Front page, Flash, Dreamweaver, MS Publish
- Develop Plan a small web news portal project
- Publish a web site or any other assignment by the faculty.

Part IV**Skilled based Subject I****THEORY: VIDEO EDITING**

- UNIT I: Basic Concepts- Non-linear editing, Hardware requirements, Introduction to Adobe Premiere, Final Cut Pro
- UNIT II: Editing Aesthetics, Concept of time and space, Editing news and documentary Selection of relevant music, Editing for different formats of T V Programmes
- UNIT III: Editing Basics, TRIM BIN, TIME LINE, and PREVIEW in context of, NLE layout, creating a time line, Main tools of editing-Selection, Range Select, Rolling, Edit, Razor, Hand Tool, Cross fade, In point, Zoom tools etc.
- UNIT IV: Advance editing, Audio mixing, Dissolve transitions and fading patterns Special audio-video effects, Titling and graphics,
- UNIT V: Taking output, rendering edited text, Authoring VCD/ACD/DVD Converting to Streaming Media, Packaging and Marketing

Reference Books:

1. Grammar of the edit by Roy Thomson
2. Nonlinear editing by Patrick Marrie
3. Digital Nonlinear Editing : New approaches to Editing
4. Film and Video by Ohanian, Thomas - Focal press.

Common Skilled based Subject

THEORY: PUBLIC RELATIONS

- UNIT I: Concept and Definition of Public Relations, Role and Scope of Public Relations
- UNIT II: Types Public Relations.: Public, Government, Private and Service Sector P.R.,
Image Building, Brand Promotion, Informational & Crisis Public Relations Management.
- UNIT III: Tools of P.R.: Media Release, Media Conference, Seminars/ Workshops, Events,
Sponsorships, House Journals, Documentaries, Annual Reports, Company, Literature & Videos, Interviews & Programmes.
- UNIT IV: P.R. & Propaganda, Publicity & Advertising or Sales Promotion and Marketing Public Relations.
- UNIT V: PR and new technology, Code of ethics, International PR, Professional Organizations, Emerging trends

Reference Books:

1. Y. K. D' souza, Mass media tomorrow, Indian publishers Distributors, New Delhi, 1977.
2. S. Ganesh, Lecturer on Mass communication, Indian publisher distributors, New Delhi, 1995.
3. J. L. Kumar, Mass media, Anmol Publications Pvt Ltd., New Delhi, 1996
4. Black, Sam (2002) Practical Public Relations, Universal.
5. Cornelissen, Joseph (2011) Corporate Communication: A Guide to Theory and Practice, Sage.
6. Harris, Thomas L.(2000) Value- Added Public Relations, NTC Business Books.
7. Heath, Robert. L (2001) Handbook of Public Relations, Sage.
8. Lattimore, Dan et.al (2011) Public Relations: The Profession and the Practice, McGraw Hill.
9. Newsom, Doug et.al (2009) This is PR, Wadsworth.

Non Major Elective

THEORY: VIDEOGRAPHY

- UNIT I: Camera: Video camera, Types of video camera,
- UNIT II: Different types of shots, camera movements, Tilt, Track, Crane movements etc
Lenses: Different types of lenses and their application
- UNIT III: Lighting: Lights and lighting, Basics of lighting, Techniques, Different types of lights used in videography, Use of filters & reflectors
- UNIT IV: Sound: What is sound? Unit of sound, Voicing, Types of microphones, use of audio mixers for recording & editing of sound
- UNIT V: Video Editing: What is editing? Rules of editing, Editing sound: U matic, Beta & MINIDV, Types of editing, Cut to cut, A/B roll, Assembly and insert editing.

Reference Books:

1. Practical Cinematography-2nd edition- Paul wheeler- Focal Press.
2. Video Production hand Book-4th edition- Gerald Millerson, Jim Owens- Focal Press.
3. Text Book: The Grammar of Shots- Thompson- Focal Press

Part: V

EXTENSION ACTIVITY

FIFTH SEMESTER

Part: III

Core Subject:

THEORY: FILM STUDIES

- UNIT I: A brief early history of silent Indian Cinema, Early talkie era in India, Evolution of the Hollywood Film Paradigm: An Overview From Lumière to Griffith
- UNIT II: Introducing Film Movements: Alternate Film Paradigms, German Expressionist Cinema, Expressionist mise-en-scène, Soviet Montage Cinema, Indian Popular Cinema
- UNIT III: The French New Wave, New Latin American Cinema, Japanese Cinema, New Iranian Cinema, Non-Fiction and Experimental Cinema
- UNIT IV: The concept of form in films, Principles of film, narrative form, non narrative form, dividing a film into parts and Genres (language, style, grammar, syntax.)
- UNIT V: Style as a formal system, narrative unity, ambiguity, a non-classical approach to narrative films, space and time, Disunity, form, style and ideology.

References Books:

1. Thoraval, Yves (2000) The cinema of India (1896 – 2000)
2. Roberge, Gaston: the subject of Cinema
3. Roberge, Gaston (1977): Film for an ecology of mind
4. Halliwell,; The Filmgoers companion 6th edition
5. Arora: Encyclopedia of Indian Cinema

Core Subject:

THEORY: MEDIA LAWS AND ETHICS

- UNIT I: Objectives and ideals of Indian Constitution; Parliamentary system, Fundamental Rights and Directive Principles of State, Federal and unitary nature; Center-State relationship; Civil services, Election, emergency powers: Amendments of constitution
- UNIT II: Freedom of the Press and restriction thereupon; The right to publish and the right to privacy. Press laws in India, Press code and ethics; Main recommendations of the Press commission I and II; Press councils
- UNIT III: Contempt of court Act 1971; Civil and criminal Law of Defamation; Relevant provisions of the Indian Penal Code with reference to seditions, Obscenity, Crime against women, Children etc; Law dealing with Obscenity
- UNIT IV: Various committees on Broadcasting; Broadcasting Autonomy; Prasar Bharati Act; Ethics of telecasting; Codes of Radio and TV; Guidelines for advertising on Radio and TV
- UNIT V: Convergence of media; Cyber Laws; Information Technology legislation, Right to information ACT); Ethics – Media council and Media Ombudsman

Reference Books:

1. Hameling, Cess (2001). Ethics of Cyber-Space. Sage Publications, 2001

2. Leslie, 'Mass Communication Etics, Thomson Learning, 2000'
3. Basu, DD (2010) Law of the Press in India. Prentice-Hall India.
4. Basu DD (2012) Introduction to Indian Constitution, Prentice Hall India
5. Zelezny E (2010) Communication Law: Liberties, Restraints and the Modern Media, Thomas Learning
6. Ninan, Pradeep Thomas (2011) Negotiating Communication Rights: Case Studies from India, Sage.

CORE PRACTICAL: SHORT FILM PRODUCTION

1. Students should write original scripts for at-least 3 short story concepts of duration not more than 5 minutes inclusive of credit lines. Concepts may be of fictional or non-fictional, but with social issues as the theme will hold the better place during Evaluation.
2. Shoot one of the best scripts among the three concepts as the short film project.
3. Each student should do individual projects containing the record and the program. The script record should be in the book binding form and short film shot must be submitted in DVD.
4. Each script in the Record should contain

Script Development

- Title
- Concept (log line, one liner)
- Synopsis
- Treatment
- Step outline

Screenplay Development

- Slug line
- Action (Video Description)
- Character Name
- Dialogue

Sample script with storyboard

Shooting Script

Editing Script

Scheduling

Approximate Budget details

Photographs of Film Making

CORE PRACTICAL: COMPUTER GRAPHICS -2D

The practical will include – 2D Graphics & 2D Animation

2D Graphics – Corel Draw, Adobe Illustrator, and InDesign

Design a four color advertisement for promoting the image of the following organizations;

- Advertising agency
- Commercial Organization
- Non-Profit Organization
- Government agency
- Service Industry

Design a 'Poster' for the above mentioned event.

Design a 'brochure' for any one of the above mentioned agencies

Design a 'Calendar' to be published by any one of the above mentioned agencies

Design the 'label & Package' cover of any consumer product

Design a '2-fold greeting card' for an occasion of your choice

Design the 'cover of a book' on any topical issue

Design a 'spokes character' for a product of your choice.

2D Animation – Adobe Flash

Create two "Title Animation" with appropriate audio for 30 seconds

Create 2D Character animation with a concept of social issues for 45 seconds.

Appropriate BG

RR and Voice over if necessary should be included.

Students should be given adequate orientation on basic design and usability concepts. The works should contain objects created by the students only.

Note: No objects/elements downloaded from the internet should be used. If static images are to be included, then the student is expected to create his/her own images using appropriate software's like adobe Photoshop

1. All exercises should be accompanied by “paper page” and “proper design” in record form along with the original file containing the exercises
2. Each student should individually submit a CD ROM of their work.

MAJOR ELECTIVE

THEORY: MEDIA CULTURE AND SOCIETY

- UNIT I:** Why study media? Understanding mass media. Characteristics of mass media. Effects of mass media on individual, society and culture-basic issues. Power of mass media. Media in Indian society. Definition, nature and scope. Function of mass media.
- UNIT II:** Media Audience analysis (mass, segmentation, product etc, social uses). Audience making. Active Vs Passive audience: Some theories of audience-Uses and Gratification Uses and Effects etc.
- UNIT III:** Media as text. Approaches to media analysis Marxist, Semiotics, Sociology, Psychoanalysis. Media and realism (class, gender, race, age, minorities, children etc.)
- UNIT IV:** Media as consciousness Industry. Social construction of reality by media. Rhetoric of the image, narrative etc. Media myths (representation, stereotypes etc.) - Cultural Studies approach to media, audience as textual determinant, audience as readers, audience positioning, establishing critical autonomy.
- UNIT V:** Media and Popular culture-commodities, culture and sub-culture, popular texts, popular discrimination, politics popular culture, popular culture Vs people's culture, celebrity industry-personality as brand name, hero-worship etc. Acquisition and transformation of popular culture

Reference Books:

1. Potter, James W (1998) Media Literacy. Sage Publications
2. Grossberg, Lawrence et al (1998) Media-Making: Mass Media in a popular culture. Sage Publications
3. Berger, Asa Authur (1998). Media Analysis Technique. Sage Publications

SIXTH SEMESTER

Part: III

Core Subject:

THEORY: ANIMATION AND GRAPHICS

- Unit: 1 Computer Graphics – Definition – Applications – Interactive – Non Interactive applications – Graphics in Broadcast Applications; Image and Graphics; Principles of Raster Graphics: Resolution, color, palates, Refresh rates and Graphic accelerators
- Unit: 2 Different types of Media, Application of Multimedia, and Properties of Multimedia systems. Multimedia image processing
- Unit: 3 Synchronous and asynchronous transmission – different formats – audio, video, music, Image, graphic, digital images.
- Unit: 4 Essentials of 3D Animation – Architecture of 3D Animation – Graphical user interface – 3D through Maya – X,Y,Z concepts
- Unit: 5 Video and animation – video signal, Compression and computed based animation, animation control. 3Ds Max – MAYA – Softimage – Character animation – Visual effects – Computer gaming – Web 3D – Games in MAYA – Special tools

Reference Books:

1. Palf. Steinmets Klara Nahrsedt, “Computing Communications and Applications”, Prentice Hall, 2002.
2. Source Training Manuals from Macromedia Flash and Adobe Photoshop
3. Tay Vaughan, “Multimedia Making it work” Osborne – MCGraw Hill, 2002.

Core Subject:

THEORY: MEDIA MANAGEMENT

- Unit: 1 Management in Media Organisation – Structure – nature and process of management – levels of management – Skills, functions and management roles. Theories of management – Classical, human relationships, modern approaches to management
- Unit: 2 Market survey: Media, product and audience profile – Television rating point (TRP) – Agencies of rating, process and method of rating – Selling of a programme, Space and time
- Unit: 3 Advertising management – Profit, sales and market share objectives, setting the budget, media selection and media scheduling.
- Unit: 4 Personnel management, hiring process, interviewing orientation, performance reviews, legal issues in personnel management
- Unit: 5 Ethics in management, Ethical code and mission statement, Etical issues in media management. Programme management – (planning, scheduling, production and

broadcasting) – Costing and budgeting of programme – Commissioned and sponsored programme

Reference Books:

1. Management of Electronic Media, Alan B. Albarran (2nd ed.), Wadsworth, 2002
2. Sexena, “Marketing Management” Tata McGraw Hill, 2003
3. The economic and financing of media companies, Robert G. Picard (Fordham University Press, 2002)
4. Who owns the media? Benjamin M. Compaine, et. al., (3rd ed., Knowledge Industry, 2001)

Core Subject:

THEORY: BASICS OF MEDIA RESEARCH

- Unit: 1 Introduction to research: Nature of enquiry Logic of induction and deduction, Natural and social sciences research – Nature and scope of communication research
- Unit: 2 Designing a research study: The problems and the method: Preparing a research proposal – Sources for research: Primary, Secondary: research problem, concept and variables – types and Relationships; level of measurement.
- Unit: 3 Hypothesis – Construction and Types; Role of theory in research – Media theories – Cognitive Dissonance, Uses and gratification, agenda setting, two step flow.
- Unit: 4 Methods of Data collection: Field studies, Holistic approach: Observation: Interviews – Questionnaires: Structured and unstructured schedules: Sampling – Probability and Non- Probability – Content analysis – Approach, method and use
- Unit: 5 Data analysis techniques – Basics of data coding and tabulation – Data analysis – averages, dispersion, Chi Square test of significance; Writing a research project; Organization of thesis, Chapterisation, Methods of citation, Footnotes and Bibliography.

Reference Books:

1. Berger, Arthur Berger – Media and Communication Research methods; An introduction to qualitative and quantitative approaches. Sage publications
2. Kumar, Ranjit: Research methodology: A step by step guide for beginners. Sage Publication
3. May, Tim: Social Research: Issues Methods and Process 2nd edition, Open UniversityPublication
4. Crotty, Foundation of Social Science Research. Sage Publication.

CORE PRACTICAL: TELEVISIONS COMMERCIAL PRODUCTION

1. Students should write original scripts for at-least 3 television commercial concepts of duration not more than 45 seconds. Concepts may be for a consumer product, a corporate company, for government sectors, and for PSA's
2. Shoot one of the best scripts among the three concepts as the television commercial project.
3. Each student should do individual projects containing the record and the program. The script record should be in the book binding form and TV commercial shot must be submitted in DVD.
4. Each script in the Record should contain

Script Development

- Title
- Concept (log line, one liner)
- Synopsis
- Treatment
- Step outline

Screenplay Development

- Slug line
- Action (Video Description)
- Character Name
- Dialogue

Sample script with storyboard

Shooting Script

Editing Script

Scheduling

Approximate Budget details

Photographs of AD Film Making

CORE PRACTICAL: COMPUTER GRAPHICS -3D

3D Animation – 3Ds Max / Maya

Animated Logo (15 seconds)

A walk through with perfect BG for 30 to 45 seconds (OR)

A character or model animation with its environment as BG for 30 to 45 seconds

Practical work should contain a record containing scripts for advanced animation works done by the student. Scripts with storyboard for at least 5 concepts for animations should be included as a part of the record

Each student should submit individual CD-ROMs with all the exercises did during the year with proper dates and the rendered output of the above mentioned topics

Students should be given adequate orientation on basic design and usability concepts. The works should contain objects created by the students only.

Note: No objects/elements downloaded from the internet should be used. If static images are to be included, then the student is expected to create his/her own images using appropriate software's like adobe Photoshop

1. All exercises should be accompanied by "paper page" and "proper design" in record form along with the original file containing the exercises
2. Each student should individually submit a CD ROM of their work.

CORE PROJECT: **DOCUMENTARY AND INTERNSHIP**

Documentary (40 External + 10 Internal)

1. Students should write original Documentary scripts for at-least 3 issues of duration not more than 5 minutes inclusive of credit lines. Concepts may be of about environmental issues, Social Issues, Any particular place etc.
2. Shoot one of the best scripts among the three concepts as the Documentary film project.
3. Each student should do individual project containing the record and the program. The script record should be in the book binding form and Documentary film must be submitted in DVD.
4. Each script in the Record should contain
Script Development
 - Title
 - Concept (log line, one liner)
 - Synopsis
 - Treatment

Mention the type of approach opted
Narration
Voice over Script
Shooting Script (if it is planned approach)
Editing Script
Scheduling
Approximate Budget details
Photographs of Film Making

INTERNSHIP (40 External + 10 Internal)

For a period of ONE MONTH during summer vacation 150 Hours of Work experience), Students will be attached to the media industry on an internship basis, with the objective to Expose them to actual situations and day to day functioning of the media industry. The Interns will be exposed to the particular area of specialization already chosen. The faculty of the department in coordination will closely monitor progress of the interns with the guides in the media industry. A report and a viva voce will be complete the process of evaluation.

Project reviews will be conducted during the internship project on regular intervals which should consist of

- Weekly report
- Presentation
- Final report

All the project work are evaluated independently by an external expert identified for the purpose. Here the students demonstrate their product and provide explanation to quarries made by external examiners.

APPENDIX - AZ66

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI – 627 012
B.Sc., GEOLOGY**

I.Course Objectives:

- i) To enable the students to have a thorough exposure to the different branches of the Science of Geology so as to grasp a comprehensive knowledge of Geology.
- ii) To facilitate the students of B.Sc., Geology to join post graduate studies which in turn offer them both job opportunities and research pursuits.
- iii) To cultivate logical thinking and analytical skills which entitles and sharpens faculties such as concentration and patience to grapple with life outside the campus.
- iv) Upon successful completion of this course, students will have acquired a familiarity with the fundamentals of the scientific method, geology, geophysics and environmental earth science.

II.Eligibility Norms for Admission to B.Sc., Geology:

Candidates for admission to the B.Sc., Degree (Geology) Course shall be required to Pass the final examination of the Plus 2 Higher Secondary Course (10+2 level) and equivalent there to with a minimum marks under academic stream (any Science group) or a course of studies recognized and approved by the Syndicate of the Manonmaniam Sundaranar University, Tirunelveli.

III.Transitory Provision

Candidates admitted to this course of studies which come into effect from June 2012 should complete the course before June 2020. Those who fail to complete the course the aforesaid stipulated time have to pass equivalent papers to be decided by the prospective U.G. Chairman of Board of Studies, Manonmaniam Sundaranar University.

MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI – 627 012
B.Sc., GEOLOGY
UNDER CHOICE BASED CREDIT SYSTEM

SCHEME OF EXAMINATIONS
(For those who joined the course from the academic year 2012-2013 onwards)

Semester / Title of the papers	Teaching hours / week	Credits
I Semester		
PART I Tamil / Other Languages (1 course)	6	3
PART II English (1 course)	6	3
PART III CORE SUBJECTS = 2 COURSES		
1.1 General Geology	4	4
1.2 Palaeontology	4	4
Core Practicals – Palaeontology	2	
ALLIED SUBJECT = 1 COURSE Part III	4	4
ALLIED PRACTICAL	2	
Part IV ENVIRONMENTAL STUDIES = 1 COURSE	2	2
TOTAL = 6 COURSES	30	20
II Semester		
PART I Tamil / Other Languages (1 course)	6	3
PART II English (1 course)	6	3
PART III CORE SUBJECTS = 2 COURSES		
2.1. Stratigraphy and Indian Geology	4	4
2.2. Crystallography	4	4
Core Practicals – Crystallography	2	
2.3 Core Practical Examination (annual) - I Palaeontology and Crystallography		2
Part III ALLIED SUBJECT = 1 COURSE	4	4
ALLIED PRACTICAL	2	2
Part IV VALUE BASED EDUCATION = 1 COURSE	2	2
TOTAL = 6 COURSES	30	24

III Semester		
PART I Tamil / Other Languages (1 course)	6	3
PART II English (1 course)	6	3
PART III CORE SUBJECTS = 1 COURSE		
3.1. Structural Geology	4	4
Core Practicals – Structural Geology	2	
Part IV SKILL BASED SUBJECTS = 1 COURSES (i) Exploration Geophysics or (ii) Gemmology	4	4
NON-MAJOR ELECTIVE = 1 COURSE	2	2
Part III ALLIED SUBJECT II = 1 COURSE	4	4
ALLIED PRACTICAL	2	
TOTAL = 6 COURSES	30	20
IV Semester		
PART I Tamil / Other Languages (1 course)	6	3
PART II English (1 course)	6	3
PART III CORE SUBJECTS = 1 COURSE		
CORE COURSES		
4.1 Mineralogy	4	4
Core Practicals – Mineralogy	2	
4.2 Core Practical Examination (annual) - II Structural Geology and Mineralogy		2
Part IV SKILL BASED SUBJECTS = 1 COURSES	4	4
NON-MAJOR ELECTIVE = 1 COURSE Part IV	2	2
Part III ALLIED SUBJECT - II = 1 COURSE	4	4
ALLIED PRACTICAL = 1	2	2
Part V Extension Activity (NCC,NSS,YRC,YWF)		1
TOTAL = 6 COURSES	30	25
V Semester		
PART III CORE SUBJECTS = 2 COURSES		
5.1 Igneous Petrology	4	4
5.2 Sedimentary and Metamorphic Petrology	4	4
Practical III Based on Igneous Petrology, Sedimentary and Metamorphic Petrology and Elective Courses III	8	
ELECTIVE COURSES (Any one in each of the following two elective groups)		
5.3 Elective - I	5	5
5.3.1 Geostatistics and Computer		

Application in Geology		
5.3.2 Petroleum and Coal Geology		
5.3.3 Applied Geomorphology		
5.4 Elective – II	5	5
5.4.1 Marine Geology		
5.4.2 Environmental Geology		
5.4.3 Planetary Geology		
SKILL BASED SUBJECTS = 1 COURSE (Common) Disaster Management	4	4
TOTAL = 6 COURSES	30	22
VI Semester		
PART III CORE SUBJECTS = 6 COURSES (3 THEORY + 3 PRACTICALS)		
6.1 Economic Geology	5	4
6.2 Hydrogeology	6	4
6.3 Applied Geology – I (Geophysics, Geochemistry, Engineering Geology, Mining Geology, Ore dressing)	6	4
ELECTIVE COURSE – III (Any one of the following courses)	5	5
6.4.1 Geology of Tamil Nadu		
6.4.2 Applied Geology – II (Natural Hazards, Remote Sensing and Geographic Information System)		
6.4.3 Medical Geology		
6.5 Practical –IV Economic Geology, Hydrogeology	4	4
6.6 Practical – V Applied Geology – I and elective courses	4	4
6.7 Practical – VI Field and Industrial training - Geological mapping (in Second year) – One week – 1 credit. - Geological tour (more than two weeks in third year) – 1 credit. - Specimen collection during Geological tour, Periodical short field trips – 1 credit. - Viva Voce on Geological mapping, Geological tour and Reports Submission – 1 credit.		4
TOTAL = 7 COURSES	30	29
Total No. of Courses = 40 (34T+6P)		
Total No. of Hours	180	
Total No. of Credits		140

Notes:

1. Distribution of marks for external and internal assessment in theory = 75:25
2. Distribution of marks for external and internal assessment in practicals = 60:40
3. There is a pass minimum of 40% for external and overall components.

III SEMESTER

STRUCTURAL GEOLOGY (CORE SUBJECT)

Unit I

Definition and scope of structural geology – topographic features - topographic map - geological map - contour lines-stratum contours – outcrops and exposures. Attitude of beds - strike and dip of the formation – trends of outcrops and v-rules. true and vertical thickness of the formations.

Unit II

Clinometer and Brunton compass and their uses Folds - Definition and parts of fold – classification of folds - criteria of recognition of folds in the field and from map. Mechanics of folding .

Unit III

Description and classification of joints, types of Unconformities- Criteria for recognition –overlap and offlap, inliers and outliers – Nappe-Klippe.

Unit IV

Faults –definition and parts of fault –classification of faults – Horst and Graben.

Unit V

Elementary knowledge in the methods of sampling and preparation of geological report.

References:

1. Billings M. P 1974, Structural geology ,Prentice hall New Delhi.
2. Ragan ,D.M. 1985. Structural Geology.
3. Hobbs,B.E, Means, W.D 1976 & William ,P.F– an outline of structural geology, John Wiley,Newyork.
4. De Sitter,L.U.1956 – Structural geology ,McGraw Hill,New York
5. Gosh,S.K.1993 - Structural Geology fundamentals and modern developments.
6. Lahee -1917. Field geology.

III SEMESTER

EXPLORATION GEOPHYSICS

Unit – I

Principles – application and limitations of electrical methods.

Unit – II

Principles – Instrument – Application of Magnetic methods

Unit – III

Principles – Instrument – Gravity anomalies – Application of Gravity methods.

Unit – IV

Seismic Methods and their Principles – Radiometric method.

Unit – V

Application of Geophysical Methods in Oil & Gas and Ground water exploration.

References:

1. Ramachandra Rao, M.B., Prasaranga, 1975. Outlines of Geophysical Prospecting - A manual for geologists by University of Mysore, Mysore,.
2. Bhimasarikaram V.L.S. 1990. Exploration Geophysics - An Outline by., Association of Exploration Geophysicists, Osmania University, Hyderabad,.
3. Dobrin , 1984. An introduction to Geophysical Prospecting by, M.B. McGraw Hill, New Delhi.
4. Telford W.M. Geldart L.P., Sheriff, R.E. and Keys D.A. 1976, Applied Geophysics. Oxford and IBH Publishing Co. Pvt., Ltd. New Delhi,
1. Parasnis, D.S 1975.Principles of applied Geophysics, Chapman and Hall.

**III SEMESTER
GEMMOLOGY****Unit – I**

The nature of crystals – crystal systems – Introduction to Gems and precious stones – kinds of Gemstones.

Unit – II

Physical and Chemical properties of various Gemstones – Form, colour, density, cleavage, fracture, lustrure, Hardness, Specific gravity, isotropism, Anisotropism, Birefrengince,simple and double refraction, colour and dispersion .

Unit – III

Precious stones – Diamond,Chrysoberyl,Topaz,Zircon,Emerald Ruby,Sapphire,Coral and pearl – semiprecious stones – varieties of quartz, Garnets, Pyroxenes, Amphiboles, Epidotes- Feldspathoids.

Unit – IV

Gem Identification – Megascopic and Microscopic identification, Gemmological refractometer, Spectroscopy, Examination of Fluorescence – Cutting of Gemstones.

Unit – V

Gems and Health, Gem Therapy, origin and mode of occurrences of Gemstones, Gems and Global Tectonics.

References:

- 1.Kennie Lyman,1984. Guide to Gems and precious stones,Simon and Schuster inc,Newyork, 384p.
- 2.E.S.Data,1935,A Text Book of Minerology,John Wiley & sons.
- 3.Deer,W.A.,Howie,R.A and Zussman,J.1966,An Introdution to the Rock forming Minerals,Longmans.
4. Berry Mason, L.G.1961 MINEROLOGY W.H.Freeman and Co.

III SEMESTER

B.Sc., GEOLOGY (Non – Major Elective) Offered by Geology to students of other department

FUNDAMENTALS OF GEOLOGY

Unit – I

Geology and its perspectives – Geology as a science and its relationship with other sciences – subdivisions of Geology.

Unit – II

A brief review of the various theories regarding the origin and age of the earth .Interior of the Earth – study of internal constitution of the earth with the help of seismic waves.

Unit – III

Solar system – its size, shape, density and movements of the Earth .Atmosphere, Lithosphere and Hydrosphere.

Unit – IV

Exodynamic Process – Weathering and its types and effect on geological formations – Brief outlines of the geological work of wind, rivers and underground water – Mechanism of erosion, transportation and deposition.

Unit – V

Geological work of lakes, Glaciers, Seas and Oceans - Brief outlines of earthquakes, its nature and origin – Volcanoes – Types and causes of volcanism.

References:

1. Homer, A., 1992, Principles of Physical Geology, Chapman & Hall, London.
2. Radhakrishnan, V., 1987, General Geology, V.V.P publishers, Tuticorin.
3. Jacobs, J.A., Russel, R.D., & Wilson, J.T., 1974. Understanding the Earth Edition ., London
4. Wyllie, P.J., 1971, The Dynamic Earth, John Wiley & sons
5. Spencer, E.V, 1962, Basic Concepts of Physical Geology, Oxford & IBH.

III SEMESTER

B.Sc., GEOLOGY (Non – Major Elective) Offered by Geology to students of other department

CLIMATOLOGY

Unit – I

Atmosphere- Fundamental principles of climatology – Earth's radiation balance –longitudinal and seasonal variation of insolation.

Unit – II

Weather elements– Temperature, pressure, humidity, clouds, wind, sunshine and rainfall – monsoon patterns.

Unit – III

Cyclones – their types and their effects and geographic distribution

Unit – IV

Classification of climates – koppen's and thornthwaite's scheme of classification –climate change.

Unit – V

Global warming – acid rain – ozone depletion

References:

1. Spencer, E.W .2003. Earth science,Mcgraw Hill,518p
2. Abbott, L.P . 2002. Natural Disasters,McGraw Hill 422p
3. Beer, T. 1997. Environmental Oceanography,VRC Press, Florida, 367p.
4. Valdiya K.S. 1987. Environmental Geology,Indian context,Tata Mc-Graw Hill,NewDelhi,581p.

IV SEMESTER

4.1 MINERALOGY (CORE SUBJECT)

UNIT-I: PHYSICAL PROPERTIES OF MINERAL: Mineral–Definition and Classification –Physical properties of minerals: Color, Luster, Transparency or diaphaneity, Crystal Habits, Cleavage, Fracture, Hardness, Specific gravity, Streak, tenacity, feel, taste, odour, electrical, magnetic and thermal Properties - chemistry of minerals: general principals of chemistry as applied to minerals: atom, ions, molecules, atomic number, mass number, valence, ionic radii – bonding in minerals –atomic substitution and solid solution - Isomorphism, polymorphism and pseudomorphism. A brief outline of silicate structure.

UNIT-II : ORTHO AND RING SILICATES: Physical properties, chemical composition, Classification, diagnostic properties and mode of occurrence of Ortho and Ring silicates: Olivine group, Garnet group, Alumino silicates-Epidote group, Zircon, Staurolite, Beryl, Cordierite and Tourmaline. Properties of precious and semi-precious minerals.

UNIT-III : SHEET SILICATES AND CHAIN SILICATES: Physical properties, chemical composition, Classification,Optical and diagnostic properties and mode of occurrence of Sheet silicates and Chain silicates: Mica group, Chlorite group and clay minerals. Pyroxene group, Amphibole group.

UNIT-IV : FRAME WORK SILICATES: Physical properties, chemical composition, Classification, Optical and diagnostic properties and mode of occurrence of Frame work silicates: Quartz group, Feldspar group, Feldspathoid group, Zeolite group and Scapolite group. Non-silicate-Spinel group, Carbonates and Phosphates.

UNIT-V : Optical Mineralogy: Nature of light - Ordinary light and Plane polarized light – Reflection and Refraction – Refractive Index – Critical angle – Total internal reflection – Single refraction. Polarising / Petrological microscope and its parts - Behaviour of light in its passage through petrological microscope – Optical properties of minerals: Colour, Form, Cleavage, Refractive Index, Relief, Alteration, inclusions, Zoning, Pleochroism, Pleochroic haloes, Twinkling, Isotropism and anisotropism, Extinction, Polarisation colors, Birefringence, Twinning - Optical accessories and their uses: Gypsum plate – Mica plate – Quartz wedge. Optical properties of Uniaxial and biaxial minerals.

References:

1. Dana, E.S.1935. A text book of mineralogy, John Wiley and Sons, New York.
2. Read,H.H. 1916. Rutleys elements of mineralogy, Thomas Murphy & co,. London.
3. Kerr, Paul. 1977. Optical mineralogy, McGraw hill, New York.
4. Deer, Howie and Zussman . 1964. an introduction to rock-forming minerals orient , Longman, London.
5. Naidu,P.R.J. 1967. Optical Mineralogy.

B.Sc., GEOLOGY (Non – Major Elective – Any One)
IV SEMESTER
BASIC HYDROLOGY

Unit – I

Origin of Water- Water resources – Categorisation of water resources - Surface water resources from Dams,Lakes etc.

Unit – II

Hydrologic cycle – Various components of hydrological cycle – Precipitation, Run-off, Infiltration, Evaporation and transpiration - Rain gauges and their distribution.

Unit – III

Groundwater occurrence and movement – Aquifers – Definition and types – Hydrogeological Properties of rocks.Basic Principle of groundwater exploration.

Unit – IV

Running water – source – weathering, erosion, transpiration and deposition – process and its features – Water Shed Management..

Unit – V

Rainwater harvesting – Definition, method and their importance.

References:

1. Alley.W.M. 1993. Regional groundwater quality – VNR- New York.
- Bouwer, H., 1978, Groundwater Hydrology,McGraw-Hill Book co.,NY
2. Davies, S.N., & Dewilest, R.J.M., 1966, Hydrogeology, John Wiley & Sons Inc., NY
3. Fetter.C.W. 1990. Applied Hydrology. Merill Publishing.
4. Karanth.K.R. 1987. Groundwater assessments and management – Tata Mc-graw Hall.

IV SEMESTER
B.Sc., GEOLOGY (Non – Major Elective – Any One)
MINERAL ECONOMICS

Unit – I

Mineral Economics and its concept - A brief outline of world's mineral resources

Unit – II

National Mineral Policy and conservation of minerals – an over view of the mines and minerals (regulation and development) act.

Unit – III

Tenor – grade and specification of ores – classification and gradation of coal – Gradation of important minerals and ores.

Unit – IV

Strategic - critical and essential minerals – classification of minerals from military point of view.

Unit –V

Marine mineral resources – Laws of seabed, marine mineral resources – Mineral taxation.

References:-

1. Evans, A.M, 1993, Ore Geology and industrial minerals, Blackwell.
2. Sinha,R.K, & Sharma, N.L, 1973, Mineral Economics ,Oxford & IBH publishing co.
3. Krishnaswamy, S., 1972, India's Mineral Resources, Oxford & IBH publishing co.

V SEMESTER**5.1 IGNEOUS PETROLOGY (CORE SUBJECT)****Unit – I**

Nature and scope of petrology, Rock cycle, intrusive and extrusive forms of igneous rocks – textures and structures of igneous rocks.

Unit – II

Principles of classification of igneous rocks, outlines of the C.I.P.W., and Tyrrell's tabular classifications.

Unit – III

Megascopic and microscopic petrography of the Granite clan, Granodiorite clan, Diorite clan, Syenite clan, the Gabbro clan and the Ultrabasic clan. Aplite, Pegmatite, Lamprophyres and Charnockites.

Unit – IV

Composition and constitution of magmas, Crystallisation of unicomponent magma, Binary magmas with simple eutectic (Diopside-Anorthite system) and with solid solution (Albite – Anorthite system) and with incongruent melting (Leucite – Silica system).

Unit – V

Bowen's Reaction principle and its bearing on igneous petrogenesis. Theories of differentiation, assimilation, petrographic provinces.

References:

1. Tyrrell, G.W. 1963.Principles of petrology, Methunn & Co.,.
2. Turner, F.J. and Verhoogen, J., 1960. Igneous and Metamorphic petrology, McGraw-Hill Book co.,.
3. Bowen, N.I., 1966. Evolution of Igneous Rocks, Dover publication,
4. Huang, Walter, T. 1962. Petrology, McGraw Hill book Co.,.
5. Hatch, F.H., Wells, A.K. and Wells, M.K. 1949. Petrology of Igneous Rocks. Thomas Murby & Co.,.
6. Hyndmann, Donald, W. 1972. Petrology of Igneous and Metamorphic rocks., McGraw – Book Co.,.

V SEMESTER

5.2 SEDIMENTARY AND METAMORPHIC PETROLOGY (CORE SUBJECT)

Unit – I

Weathering – decomposition and disintegration of rocks – Erosion – Transportation – Deposition – A brief idea of diagenesis and lithification. Size and shape of sediments. Relative abundance, composition and textures of sedimentary rocks. Classification of sedimentary rocks into clastic, residual, chemical and organic.

Unit – II

Descriptive study of the rocks formed by the residual, mechanical, chemical and organic processes. An outline of heavy mineral analysis and its utility in the provenance studies.

Unit – III

Definition and types of metamorphism – Factors of metamorphism – Zones, grades and facies of metamorphism – Stress and antistress minerals – Metamorphic textures and structures.

Unit – IV

Effects of Dynamic, Contact and Regional (Dynamothermal and burial) Metamorphism on the following rocks. Carbonates, pelites, psammites, ferruginous and acid, intermediate, basic and ultrabasic igneous rocks.

Unit – V

Metamorphic differentiation – Metasomatism – Anatexis – Palingenesis – Diaphthoresis – An outline of granitisation. A brief discussion on the origin of amphibolite, charnockite, migmatite and eclogite.

Reference:

1. Tyrrell, G.W. 1963. Principles of Petrology, Methunn, Co.,.
2. Winkler H.G.F. 1974. Petrogenesis of Metamorphic rocks, Third Edn. Springer Verlag.
3. Turner F.J. 1968. Metamorphic Petrology, McGraw Hill.
4. Miyashiro, A. 1973. Metamorphism and metamorphic belts Allan and Unwin.
5. Hyndman, F.D. 1972. Petrology of Igneous & Metamorphic rocks McGraw Hill.
6. Blatt H. Middleton, G and Murray R. 1972. Origin of Sedimentary Rocks, Prentice Hall.
7. Folk F.L. 1968. Petrology of Sedimentary Rocks Hempill's University Station Texas,.
8. Krumbein W.C. and Pettijohn F.J. 1938. Manual of Sedimentary Petrology, Appleton Century Co.,.
9. Pettijohn F.J. Potter, P.E. Silver, R., 1972. Sand and Sand Stones, Springer Verlag.
10. Pettijohn F.J. 1957. Sedimentary Rocks, Harper & Row.

V SEMESTER

5.3 Elective - I

5.3.1. GEOSTATISTICS AND COMPUTER APPLICATIONS IN GEOLOGY

Unit – I

Computer capabilities – General structure of a computer – Hardware components. Input devices (keyboard and mouse) output devices (dot matrix printers and Inkjet Printers) and storage devices (Disk organization, Floppy Disks, Hard disks)

and Compact discs) Computer applications in geology – Structured programming, algorithm and flowchart.

Unit – II

Windows 2000:- Introduction – Graphical user interface objects:- windows, icons, menus, pointers. desktop features: - short cut, task Bar, start, time and status. MS – WORD 2000: Introduction – menu bar – tool bar – drawing tools bar – Document creation and formatting. MS – EXCEL 2000: Worksheet concept – menu Bar, tool Bar, building formulas.

Unit – III

Data Analysis using MS – Excel 2000: Data file creation – calculation of summary statistics, students 't' test, Chi-Square test, F – Test, Regression and Correlation. Graphical representation of Data: Histograms Pie charts and Bivariate plots.

Unit – IV

Scales of measurements: Nominal, Ordinal, Interval and Ratio scales. Discontinuous and continuous data. Ungrouped and grouped scores. Graphical representation of data; bar charts, histograms, line graph, XY graph, frequency and cumulative frequency curves.

Unit –V

Definition of Statistics, statistical Universe, sample and population. measures of central tendency – mean, median, mode, standard deviation, skewness and kurtosis. Hypothesis testing, χ^2 student's t and Snedecor's F tests. simple linear regression and simple linear correlation. Probability and normal distribution.

References:

1. Krishna, N. 2001. Computer Fundamentals and windows with Internet Technology, SCITECH, Tirunelveli,.
2. Davies, J.C. 1973. Statistics and data analysis in Geology, Wiley,.
3. Harbaugh, J.W. & Merriam, D.F.1965. Computer application in Stratigraphic analysis, Wiley..
4. Krumbein W.C. and Gray bill F.A. 1965. An introduction to statistical models in Geology, McGraw Hill,.
5. Miller R.L. Kahn, J.S. 1962. Statistical analysis in the Geological Sciences, Wiley.

V SEMESTER

5.3.2. PETROLEUM AND COAL GEOLOGY (Elective I)

Unit – I

Origin, Migration and entrapment of natural hydrocarbons, Composition and constituents of petroleum.

Unit – II

Characters of source and reservoir rocks; structural, stratigraphic and combinations traps, Salt domes.

Unit – III

Petroleum exploration through well logging method. Geographical and geological distributions of onshore and offshore petroliferous basins of India.

Unit – IV

Definition and origin of coal. Fundamentals of coal petrology, microscopic constituents of coal, peat, lignite, bituminous and anthracite coal.

Unit – IV

Industrial application of coal petrology, Coal Fields of India.

References:

1. Levorsen, A.L. 1954. Geology of Petroleum, McGraw Hill Book Co.,.
2. Gokhale, K.V.G.K.D. Rao, T.C., 1973. Ore deposits of India. Thosman Press India Ltd., Delhi – 6.
3. Krishnaswamy, S. 1972. India's Mineral Resources, Oxford & IBH Publishing Co..
4. Stanton, R.L. 1972. Ore petrology, McGraw – Hill Book Co.,.
5. Bateman, Alan M. 1961. Economic Mineral Deposits, Asia Publishing House,.
6. Serra, O. 1985. Sedimentary environments from wireline logs. Schlumberger,
7. Umapathy, R.M. 2006. Mineral deposits of India.. Dattsons, Nagur.

V SEMESTER

5.3.3 APPLIED GEOMORPHOLOGY (Elective I)

Unit-I

Definition of geomorphic agent, gradation, degradation. – Geomorphic cycle and cycle of erosion – Definition of processes, climatic influences and products.

Unit-II

Tectonic landforms – Tectonic scarps – Fault valleys – Landforms made by folding – volcanic landforms.

Unit-III

Fluvial Geomorphology – Drainage basin evolution – Drainage patterns – Fluvial erosional and depositional features.

Unit-IV

Glacial Geomorphology – glacial erosion, transportation and deposition. – Mass wasting and hill slopes.

Unit-V

Coastal Geomorphology – Processes and coastal landforms – Karst topography – Applications of remote sensing techniques in geomorphological interpretation.

References

1. Bloom, A.L., 2003, Geomorphology, A systematic Analysis of Late Cenozoic – Landforms. Third Edition, PHI Pvt.Ltd., NewDelhi – 110001.
2. Arthur Holmes – Principles of physical Geology, ELBS, III Edition, 1981.
3. Thornbury – Principles of Geomorphology, John Willey & sons Newyork, 1969.
4. Longwell, Flint and Sanders. 1969. Physical Geology, John Willey and sons, Newyork.
5. Radhakrishnan, V. 1997. General Geology, VVP Publishers Tuticorin, 282p.

V SEMESTER
5.4 Elective - II
5.4.1. MARINE GEOLOGY

Unit – I

History of marine Geology. Principles of Echo sounder. Side scan sonar. Position fixing at Sea.

Unit – II

Bottom sediment samplers – waves, tides.

Unit – III

Tsunamis – currents – littoral processes.

Unit – IV

Geomorphology of the ocean floor – sea floor spreading – coastline classification – beach materials.

Unit – V

Eustatic Sea level changes, marine deposits – Petrology, Laws of the sea – Coastal zone regulation.

References:

1. Kuenen, Ph.H., Marine Geology. John Wiley and Sons, 1950
2. King, C.A.M. – Beaches and coasts, Edward Arnold, London 1959.
3. King, C.A.M. – Introduction to marine Geology and Geomorphology. Edward Arnold, London, 1975.
4. Radhakrishnan, V. General Geology V.V.P. Publishers, Tuticorin, 1996.
5. Shepard, F.P. Geological Oceanography, Heinmann, London, 1978.
6. The Ocean, A Scientific American book, W.H. Freeman and company, SanFrancisco, 1969.
7. Manimaran,G. 2007. Indian Ocean Tsunami and Related events. Renugapublications. Tirunelveli.pp.72

V SEMESTER
5.4.2. ENVIRONMENTAL GEOLOGY (ElectiveII)

Unit – I

Geological agents and their impact on environment, renewable and non-renewable earth resources, Environmental impact of mineral extraction and mining.

Unit – II

Carbon-di-oxide in atmosphere, limestone deposits in the geological sequences. Global Warming and Green House Effect.

Unit – III

Impact assessment of degradation and contamination of surface water and ground water quality due to industrialization and urbanisation.

Unit – IV

Environmental problems related to natural disasters and their mitigation – earthquakes, Valcanoes, Tsunami, Floods, droughts and storms.

Unit –V

Medical Geology – Introduction to Geomedicines, Heavy metals and health hazards – Mineral induced diseases: Minameta, Fluorosis, Silicosis, Itai-itai, Goitre and

cretin, Keshan, Enviro Scar, Mesothelioma, Anaemia, Lung Cancer, Wilson's diseases. Mineral remedies to diseases including Gem Therapy. Drugs from ocean.

References:

1. Strahler and Strahler .1973. Environmental Geosciences.
2. Valdiya, K.S. 1987. Environmental Geology, Indian Context. Tata McGraw Hill publishing Co. New Delhi,
3. Davis, S.N. 1992. Physical environment.
4. Balasubramanian, A.1995. Ecology, Environment and pollution, Indira publishers, Mysore.
5. Cannon, H.L. and Hopps, H.C., 1972. Geochemical environment in relation to health and diseases, Newyork Academy of science.
6. Keller, E.A., 1985. Environmental Geology, CBS publishers, NewDelhi,.
7. Libes, S.M. 1992. An introduction to marine biogeochemistry John wiley & Sons, Newyork,.
8. Trace elements in Human Nutrition and Health, 1996. world Health Organisation,.
9. Varley, H., 1988. Practical clinical biochemistry. IV Ed. CBS publishers, NewDelhi,.
10. Saha N.N. 1984. Healing through Gems, Sterling Publ. Pvt. Ltd., New Delhi.

V SEMESTER

5.4.3 PLANETARY GEOLOGY (Elective II)

Unit-I

Introduction - Solar system – Origin of Universe – Big Bang theory – the Galaxy – Origin of the solar system.

Unit-II

Sun as star – Black spots – Solar phenomena- Major and minor planets of the solar system.

Unit-III

Lunar Geology – The moon – Earth relationship – Chemical and mineral composition of the moon. – Description of lunar rocks.

Unit-IV

Meteorites – their types – chemical composition –Major, minor and trace and rare earth elements - Distribution and scientific information.

Unit-V

Salient features of the various Planets – Mercury, the Earth, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto.

References

1. Radhakrishan, V., 1996, General Geology, V.V.P. Publishers, (Second Revised Edition), Tuticorin – 628008.
2. Bhandari, N., 2008, The Mysterious Moon and Indian's Chandrayaar Mission, Vigyan Prasar, DST., NOIDA – 201207.
3. Moorees and Twiss, T.T. 1995, Tectonics, Freeman.
4. Spencer. E.W. 2003. Earth science. McGraw Hill.
5. <http://solarsystem.nasa.gov/index.cfm> NASA's Solar System Exploration site

V SEMESTER
5.5 - Skill based subject (Common)
DISASTER MANAGEMENT

Unit I:

Disaster: Meaning, Factors and significance, causes and effects of disaster, Disasters: A global view. Disaster profile of India – Regional and seasonal.

Unit II: Earthquakes

General characteristics, Pre-Casars: Instrumental and non-instrumental vulnerability, impact and effects, Nature of damage, earthquakes prone areas in India.

Unit III: Floods

Causal phenomena and characters of floods, vulnerability, predictability, forecasting and warning, preparedness mitigation with special reference to flood plain zoning adverse effects of flood.

Unit IV: Cyclones

Characteristics, forecasting and warning systems, preparedness, such reduction measures, effects, cyclones prone areas in India.

Unit V: Land slide and snow avalanches

Characteristics and causes of land slide and snow avalanche. Characteristics and causes, vulnerability, Risk reduction measures, preparedness, effects and impacts.

References:

1. Aravind Kumar Anmal, 2006. Disaster Management – Recent Approaches by Publication.
2. Ghorh. G.K Disaster Managemen. 2006. A.P.H Publishy Corporation.
3. Singh,2006. Disaster Management . Rawat Publication.
4. Narayan, B.2006. Disaster Management. A.P.H Publishy Corporation.
5. Nikij Kumar. 2006. Disaster Management . Alfa Publication, 2006.

VI SEMESTER
6.1. ECONOMIC GEOLOGY(Core subject)

Unit – I

Ore, Protore, Ore minerals, gangue minerals, Tenor of ores, Geologic thermometers, metallogenic epochs and provinces – Lindgren's and Bateman's classification.

Unit – II

An outline of the processes of formation of mineral deposits. Magmatic, hydrothermal, mechanically concentrated mineral deposits (placers), oxidation and supergene sulphide enrichment, residual deposits. Metamorphism – structural control on ore localization.

Unit – III

Mineralogical characters, mode of occurrence and distribution of important ores – iron, copper, manganese, lead, zinc, gold and chromium.

Unit – IV

Radioactive minerals. Minerals required for refractory, cement, ceramic, paint and pigments, insulators and fertilizers.

Unit –V

Classification, occurrence and distribution of coal in India. Origin occurrence and distribution of petroleum in India. Oil fields of India, Mineral wealth of Tamil Nadu.

References:

1. Bateman. A.M. 1961. Economic mineral deposits, John Wiley & Sons.
2. Krishnaswamy. S. 1972. India's Mineral Resources, Oxford and IBH Publishers, New Delhi.
3. Gokhale.K.V.K. and Rao. T.K. 1972. Oredeposits of India, Thomson press, New Delhi.
4. Edward R. and Atkinsan K. 1986. Ore deposit Geology, Chapmon and Hall, 1.
5. Deb. S. 1980. Industrial minerals and rocks of India. Allied publisher. Pvt.Ltd.

VI SEMESTER 6.2. HYDROGEOLOGY

Unit – I

Hydrologic cycle, origin of groundwater, vertical distribution of ground water, hydrological parameters, types of aquifers, springs.

Unit – II

Hydraulic conductivity, Determination of aquifer constants. Ground water flow - Darcy's law.

Unit – III

Occurrence of groundwater in Igneous, Sedimentary and Metamorphic rocks. Occurrence in alluvial, glacial and coastal plains.

Unit – IV

Exploration for ground water – Geological, remote sensing and geophysical methods.

Unit – V

Water quality – suspended and dissolved constituents – suitability for domestic, industrial and agricultural purposes.

References:

1. Rangunath. 1987 Ground water – Wiley Eastern,.
2. Todd. D.K. 1980. Ground water Hydrology, John Wiley,
3. Davis and Diewett. 1966.Hydrogeology, John Wiley,.
4. Rao R.M. & Subrahmanyam A, 1999. Basic principles of hydrogeology, Tenali.
5. Arul, P.2000.A text book of Ground water. Dhanam Agency, Virudachalam.

VI SEMESTER

Applied Geology Paper I

(Geophysics, Geochemistry, Engineering Geology, Mining Geology and Ore Dressing)

Unit- I

Fundamental principles – Electrical Resistivity method – Gravity method – Magnetic method – Seismic Methods – Instrumentation and field procedures.

Unit-II

Definition, aims and scope, Geochemical structure and composition of the earth. Different hypothesis about core, mantle and crust. Distribution of elements in the geosphere. Geochemical affinity. Geochemical classification of elements. .

Unit-III

The role of Geology in civil engineering. Properties of rocks – Strength and elastic properties. Properties of building stones concrete aggregates, rail and road material. Types of earth movements and their classification and preventive measures. Geological investigations pertaining to the foundations of dams, reservoirs and tunnels.

Unit-IV

Prospecting sampling and evaluation of ore resources. Outline of the method of metal mining. Opencast and underground mining. Methods of coal mining.

Unit - V

Principles and scope of ore dressing Physical and chemical properties as applied to ore dressing. A brief study of common crushers, grinders, and classifiers, Concentration of ore minerals by magneto – electrostatic and floatation processes.

References:

1. Dobrin M.B., and Savit C.H.,1988. Introduction to Geophysical Prospecting (4th ed.,) McGraw – Hill, New York.
2. Parasnis D. S .1997, Principles of applied geophysics, Chapman & Hall, 2-6 Boundary Row, London SE1 8HN, UK.
3. Ramachandra Rao, M.B., Prasaranga, 1975. Outlines of Geophysical Prospecting - A manual for geologists by University of Mysore, Mysore,.
4. Kruskopt E.B. 1967. Introduction to Geochemistry. Mc. Graw Hill 1967
5. Rankama, K. and Sahama, 1950, Geochemistry, University of Chicago Press
6. Brain Mason, 1966. Principles of Geochemistry.Willey 1966
7. Krynine and Judd. 1957. Principles of Engineering Geology and Geo-techniques. Mc. Graw Hill.
8. Peters W.C.Exploration Mining Geology. John Willey.
9. Arogyasamay, R.N.P. Course in Mining Geology. Oxford & I.B.H.Publishing Co.
10. Sinha R.K., & Sharma, N.L, Mineral Economics , Oxford & I.B.H.Publishers.
11. Reedman.J.H.Techniques in mineral economics. Allied Scientific Publishers.
12. Sathya Narayanswami, B.S., Engineering geology. Chaparral & co. Delhi,2000.

VI SEMESTER

6.4 Elective

6.4.1. GEOLOGY OF TAMILNADU

UNIT-I

Introduction to Geology, The Planet earth. Basic concepts of origin and interior of the earth. Composition of the earth crust mantle and core. Dynamics of earth elements of plate tectonics, Mountains, Earthquakes and Volcanoes.

Unit-II

Igneous, Sedimentary and Metamorphic rocks - General Geological setting of Tamil Nadu – Structure and tectonics of TamilNadu. Geological Time scale. Palghat – Cauvery, Moyar – Bhavani and Achankovil shear Zones.

Unit-III

Archean systems – Sathiyamangalam Greenstone Belt – Penninsular gneiss, charnockite, khondalites proterozoic formations South of Palghat – Cauvery shear zones. Kerala khondalite Belt.

Unit-IV

Gondwana formations – Sivaganga formations Sriperambalur beds Tarani formations, Cretaceous of Trichinappalli marine formations

Unit-V

Tertiary formations – Cuddalore formations – Neyveli Lignite formation, Kariaikal formations, Panaparai Sandstone – Recent beach placer deposits – Manavalakuruchi, Thoothukudi coast – Laterite – Bauxite and red and black soils.

References

1. Subramanian. K.S. and Selvan, T.A. 2001. Geology of TamilNadu and Podicherry. Geological Society of India, Bangalore- 192 p.
2. Krishnan M.S.. 1968. Geology of India and Burma, Higginbothams, 1968.
3. Wadia D.N. 1953. Geology of India, Macmillian and Co.
4. Kumar. 1985. Fundamentals of Historical Geology and Stratigraphy of India.

VI SEMESTER

6.4.2. APPLIED GEOLOGY - II (Natural Hazards, Remote Sensing and GIS)

Unit-I

Introduction to natural hazards – Types of natural hazards and their classification.

Unit-II

Earthquakes – Types of elastic waves – Kinds of earthquakes – Seismograms – Richter's and movement scales – Causes, prediction and prevention of earthquakes.

Unit-III

Landslides – Classification – Driving forces and causes – Mitigation of landslides.

Unit-IV

Introduction to remote sensing – Electromagnetic spectrum – Sensors – Aerial platforms – Resolution of satellite data – Visual interpretation of satellite images – Application of satellite remote sensing in geological sciences.

Unit-V

Application GIS in earth science, Basic principles of geographic information system – Basic geographic concepts – spatial awareness, spatial measurement spatial location and reference, spatial patterns Map Basics: Nature of maps, map scale, map projections, Grid Systems for mapping
GIS data models: vector and raster data models.

References

1. Gary L. Prost 2001. Remote Sensing for geologists Guide to Image Interpretation. Gordon and Breach Science Publishers pp. 374,
2. Michale N.DeMers , 2005. Fundamental of Geographic Information Systems. Wiley India (p) Ltd.pp.467.
3. Kang-tsung chang. 2002. Introduction to Geographic Information Systems. McGraw-Hill companies, pp 348.
4. Ian Heywood, Sarah Cornelius and steve carver. 2003. An Introduction to Geographic Information Systems, Pearson, pp 295.

VI SEMESTER
6.4.3. MEDICAL GEOLOGY

Unit I

Medical geology: perspective and prospects-Natural distribution and abundance of elements – Anthropogenic distribution sources- uptake of elements from a chemical point of view- Uptake of elements from a biological point of view.

Unit II

Biological functions of the elements- Geological impacts on nutrition – responses of elements- Volcanic emissions and health- Radon in air and water.

Unit III

Arsenic in groundwater and the environment- Fluoride in natural waters- Water hardness and health effects- Bioavailability of elements in soil- Selenium deficiency and toxicity in the environment- Soil and iodine deficiency.

Unit IV

Geophagy and the involuntary ingestion of soil – The ecology of soil-borne human pathogens- Animals and medical geology- Environmental pathology.Toxicology- GIS in human health studies- Histochemical and microprobe analysis in medical geology. Introduction to Geomedicines

Unit V

Heavy metals and health hazards – Mineral induced diseases: Minamata, Fluorosis, Silicosis, Itai-itai, Goitre and cretin, Keshan, Environmental Cancer, Mesothelioma, Anaemia, Lung Cancer, Wilson's diseases. Mineral remedies to diseases including Gem Therapy. Drugs from ocean.

References

1. Trace elements in Human Nutrition and Health, 1996. World Health Organisation,.
2. Varley, H., 1988. Practical clinical biochemistry. IV Ed. CBS publishers, New Delhi.
3. Saha.N.N.1984. Healing through Gems, Sterling Publ. Pvt. Ltd., New Delhi.
4. Bowman, C.A. and Bobrowsky, P.T., 2002, Urban geochemistry and associated health hazards in the sediments of Victoria, British Columbia (abs):Geological Society of America Program with Abstracts, vol. 34, no. 6, pp.419.
5. Mills, C.F., 1996, Geochemical aspects of aetiology of trace elements and related diseases.
6. Mayer. A.I.2007. Medical Geography, APH pub.corp.
7. Vohra.S.B. and Athar. M. 2008. Mineral Drugs. Norosa Publishing house, New Delhi. 207pp.
8. Selinus, O. 2005. Essential of medical geology. Impact of natural environment on public Health. Academic Press.1024.

PRACTICALS – CORE PRACTICAL 1 (ANNUAL)

B.Sc. Geology (2012-2013 onwards)- Core Course:

PALAEONTOLOGY AND CRYSTALLOGRAPHY PRACTICALS

PALAEONTOLOGY PRACTICAL

Identification and Description of Following Fossils.

- | | |
|--------------|---|
| Coelenterata | – Montlivaltia, Zaphrentis |
| Brachiopoda | – Productus, Spirifer, Terebratula, Rhynchonella. |

- Pelecypoda – Arca, Spondylus, Trigonina, Meretrix, Venus, Alectryonia, Ostreae, Gryphaea, Exogyra.
- Gasteropoda – Physa, Turritella, Fusus, Trochus, Conus.
- Cephalopoda – Nautilus, Ceratite, Aconthoceras and Belemnites.
- Trilobites – Paradoxides, Calymene.
- Echinoids – Hemiaster, Micraster, Stigmatopygous.
- Plant Fossils – Glossopteris, Gangamopteris, Ptillophyllum, Wood fossil.

CRYSTALLOGRAPHY PRACTICAL :

- Cubic System : Normal Class – Galena, Spinel, Garnet, Fluorite, Diamond.
: Pyritohedral class – Pyrite.
- Tetragonal System : Normal Class – Zircon, Rutile, Cassiterite, Vesuvianite, Apophyllite.
- Hexagonal System : Normal Class – Beryl.
: Hemimorphic Class – Zincite
: Rhombohedral class – Calcite and Corundum.
- Orthorhombic System: Normal class – Barite, Staurolite, Sulphur, Topaz.
: Hemimorphic class – Calamine.
: Sphenoidal class – Epsomite.
- Monoclinic System : Normal class – Gypsum, Epidote, Orthoclase.
- Triclinic System : Normal class – Axinite and Albite.

CORE PRACTICAL II (ANNUAL)

Structural Geology and Mineralogy

Structural Geology : Tracing outcrops-three point problems. Interpretation of Geological maps.

Mineralogy:

Identification and description of the following minerals in thin sections. Quartz, Orthoclase, Albite, Labradorite, Leucite, Nepheline, Sodalite, Hypersthene, Enstatite, Augite, Diopside, Hornblende, Actinolite, Tremolite, Biotite, Muscovite, Olivine, Garnet, Sphene, Tourmaline, Andalusite, Kyanite, Sillimanite, Cordierite, Staurolite, Topaz, Calcite, Apatite, Dolomite, Epidote.

Identification and description of the following silicate minerals. Quartz and its varieties, Feldspar group, Feldspathoids, Pyroxene group, Amphibole group, Epidote, Mica, Olivine, Garnet, Aluminum Silicate group.

**CORE PRACTICAL III (ANNUAL)
PETROLOGY AND ELECTIVE SUBJECTS**

Megascopic identification and description of the following rocks in hand specimen.

Mica Granite, Hornblende Granite, Pegmatite, Aplite, Mica Syenite, Hornblende syenite, Pyroxene syenite, Peridotite, Nepheline Syenite, Dolierite, Gabbro, Norite, Dunite, Pyroxenite, Anorthosite, Dolerite, Dolerte porphyry, Rhyolite, Trachyte, Andesite, Felsite, Basalt, Obsidian, Pitchstone, Pumice, Volcanic tuff, Volcanic breccia

Vitrophyre, Conglomerate, Breccia, Sandstone Arkose, Grit, Flagstone, Shale, Laterite, Limestone, Clay, Chalk, flint, Chert, Phosphatic nodule, Peat, Lignite Bituminous coal, Anthracite, Mica gneiss, Hornblende gneiss, Banded Gneiss, Garnetiferous Biotite gneiss, Cordierite – Sillimanite gneiss, Augen gneiss, Leptynite, Mica schist, Hornblende schist, Chlorite schist, Chlorite magnetite schist, Chlorite garnet schist, Mica garnet schist, Mica staurolite schist, Talc schist, Graphite schist, Phyllite, Grayslate, Redslate, Quartzite, Marble, Dolomite, Ophicalcite, Quartz magnetite rock, Amphibolite, Eclogite, Khondalite, Gondite, Charnockite and Calc granulite.

Microscopic identification and description of the following rocks in thin section:

Muscovite Biotite granite, Hornblende granite, alkali granite, Tourmaline granite, Pegmatite, Aplite, Mica syenite, Hornblende syenite, Nepheline syenite, Quartz diorite, Gabbro, Olivine Norite, Dunite, Peridotite, Pyroxenite, Granite Porphyry, Syenite Porphyry. Diorite porphyry, Dolerite, Rhyolite, Trachyte, Phonolite, Andesite, Basalt, Olivine basalt, Obsidian, Pitch-stone, Conglomerate, Breccia, Sandstone, Arkose, Grit, Shale, Laterite Limestone, Oolitic Limestone, Shell limestone, Clay, Chalk, Flint, Chert, Coal, Mica schist, Chlorite schist, Hornblende schist, Staurolite schist, Kyanite schist, Garnetiferous mica schist, Chistalite slate, Mica gneiss, Pyroxene gneiss, Charnockite, Marble, Eclogite, Amphibolite, Khondalite, Cordierite Sillimanite gneiss.

GEOSTATISTICS AND COMPUTER APPLICATIONS IN GEOLOGY

GEOSTATISTICS:

Manual determination of summary statistics (Measures of Central Tendency, Standard Deviation, Skewness and Kurtosis) – Hypothesis testing by Chi-square, Student's 't' and 'F' tests – Linear Regression and Linear correlation.

COMPUTER APPLICATIONS IN GEOLOGY

Data file creation – Statistical solution of geological problems using MS-EXCEL 2000 – Construction of Histograms, Pie charts and Bivariate Plots using Excel 2000.

Marine Geology

Beach profile measurement and classification of beach morphology. Heavy and light mineral separation and identification.

CORE PRACTICAL IV (ANNUAL)

ECONOMIC GEOLOGY AND HYDROGEOLOGY

Economic geology:

Identification and description of the following economic minerals:

Magnetite, Ilmenite, Hematite, Pyrite, Pyrolusite, Psilomelane, Chromite, Wulframite, Chalcopyrite, Malachite, Galena, Magnesite, Bauxite, Stibnite, Cinnabar, Gypsum, Barite, Monazite, Rutile, Sillimanite, Kyanite, Corundum, Calcite, Dolomite, Beryl, Asbestos, Orpiment.

Hydrogeology:

Analysis of rainfall data and resistivity data.

CORE PRACTICAL V (ANNUAL)

Applied Geology I and Elective subjects

Geophysics, Geochemistry, Engineering Geology, Mining Geology and Ore Dressing and Elective Courses.

Geophysics:

Elementary analysis of seismic reflection and refraction data.

Geochemistry,

Classification of ground water and rock types based on geochemical data.

Engineering Geology:

Calculation of compressive strength, Shearing strength and Tensile strength of rocks. Select a suitable site from geological and topographical maps for dam and tunnel construction.

Mining Geology:

Estimation of ore reserves.

Problems and maps related to geology of Tamilnadu / Remote sensing and GIS/Medical Geology.

**PRACTICAL VI
FIELD AND INDUSTRIAL TRAINING**

Geological mapping (One week mapping camp)

Geological tour more than two weeks days

Viva voce on Geological mapping and Geological tour

Reports submission

Specimen collection and short field trips.

**MODEL QUESTIONS
B.Sc. Degree Examination, November 2012
Geology main**

Time: Three Hours

Maximum: 75
marks

Section - A

Answer all questions. All questions carry equal marks. 10 x 1=10 Marks

1. The largest planet in the solar system is
a) Neptune b) Earth c) Jupiter d) Venus
2. The thickest portion of the continental crust lies
a) Beneath the highest mountain ranges b) Above the highest mountain ranges
c) Beneath the lowest mountain ranges d) All of the above
3. The boundary between crust and mantle is termed as
a) Moho b) Conrad c) Gutenberg d) Asthenosphere
4. Age of the earth is regarded as approximately _____ million years
a) 3,450 b) 4,890 c) 4,500 d) 5,400
5. Pot holes are characteristic features _____
a) youth stage b) mature stage c) old stage d) all of the above
6. An examples of wind deposits is
a) Morain and drumlin b) Loess and dunes c) Levees d) Kettle holes
7. Coral reefs are
a) inorganic deposits b) sub-organic deposits c) organic deposit d) all of above
8. The Deccan Plateau is the result of

- a) Hygrometer b) Anemometer c) seismograph d) seismogram
 9. The hot spring that discharge at periodical interval is known as
 a) Hot spring b) Geyser c) Artesian Spring d) None
 10. Volcanoes which are erupting at present are knows as
 a) Active volcano b) dormant volcano c) extinct volcano d) none

Section - B

Answer all questions. All questions carry equal marks

5 X 5=25

11. a. write note on minor plates.
 (or)
 b. Moho discontinuity –Comment.
 12. a. Half life period –Write notes.
 (or)
 b. Briefly comment on Subduction zone.
 13. a. Explain Origin of spring.
 (or)
 b. Outlines various type of coral reefs.
 14. a. Distinguish between seismograph and seismogram.
 (or)
 b. Describe erosional features of wind.
 15. a. Describe different types of volcanic products.
 (or)
 b. Give and note on – Ring of fire.

Section – C

Answer all questions. All questions carry equal marks

5 x 8 = 40

16. a. Give an account of origin of solar system.
 (or)
 b . Give a brief account of composition of the Earths core and Asteroids.
 17. a. Enumerate the important methods for determining age of the earth.
 (or)
 b. Write short notes on (i) Characteristic features of continents
 (ii) Radioactivity
 18. a. Define weathering. Explain in detail the various types of weathering.
 (or)
 b. Give a brief account of the following.
 (i) Depositional feature of wind
 (ii) Meanders and Ox-bow lakes
 19. a. What are glaciers? How are they classified?
 (or)
 b. Write explanatory notes on the following
 (i) Origin of coral reef
 (ii) Wave characteristics.
 20. a. Define a volcano. Explain briefly the different types and phases of volcanoes.
 (or)
 b. Write brief notes on the following:
 (i) Different scales of earthquakes.
 (ii) Effects of earthquakes.

APPENDIX - AZ67

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI - 627 012

B.C.A Degree Course under CBCS

ACADEMIC YEAR 2012 - 2013

3 years - 6 Semesters - Course

Syllabus for III & IV Semester with effect from June-2013

III SEMESTER

S.I.NO	Components	Subjects	Hours	Credits
1	Part-III Core – Theory	Java Programming	6	4
2	Part-III Core – Theory	Essential of Financial Accounting	6	4
3	Part-III Core - Practical	Java Programming Lab	6	---
4	Allied subject-II Theory	Data Structure	4	4
5	Allied subject-II Practical	Data Structure Lab	2	-----
6	Part-IV	Skilled Based Subject	4	4
7.		Non-Major Elective-I	2	2
Total	(5 Theory +1 practical = 6 Courses)		30	18

Note: Practical Credits are added in the even semester due to Year-wise Practical Exam

IV SEMESTER

S.I.NO	Components	Subjects	Hours	Credits
1	Part-III Core – Theory	Visual Basic	6	4
2	Part-III Core – Practical	Visual Basic Lab	6	4
3	Major Elective	Elective-I	6	5
4	Allied subject-II Theory	Resource Management Techniques	4	4
5	Allied subject-II Practical	Data Structure Lab	2	2
6	Part-IV	Skilled Based Subject	4	4
7.		Non-Major Elective-II	2	2
8	Part-V	Extension Activity		1
Total	(5 Theory +2 practical = 7 Courses)		30	26

$$\begin{aligned} \text{Total Credits} &= 26 + \text{III Semester Lab (Part-III Core – Practical- 4Credits)} \\ &= 26 + 4 = 30 \text{ Credits} \end{aligned}$$

LIST OF ELECTIVE PAPERS:

OPTIONAL-I (Choose any one)

1. MICROPROCESSOR
- 2 .E-COMMERCE
- 3 . COMPUTER NETWORKS

SEMESTER - III

CORE SUBJECT – 1

JAVA PROGRAMMING

UNIT 1

Genesis of Java: Creation of Java - why java is important to internet -
The java Buzz words - An overview of Java Object Oriented Programming

Data types: Simple types - Integers - Floating point types - characters
- Booleans - A closer Look at Literals - Variables - Type conversion and casting -
Automatic type promotion in Expressions - Strings.

Arrays: One Dimensional Array - Multi Dimensional Array

Operators: Arithmetic Operators - Bitwise operators - Relational
operators - Boolean Logical operators - Assignment operators - Conditional
operators - Operator precedence.

UNIT II

Introducing Classes: Class Fundamentals - Declaring objects -
Assigning object Reference variables - Introducing Methods - Constructors -
Garbage collection – Finalize() Method - Stack class

A Closer Look at Methods and classes: Overloading Methods - Using
objects as parameters - Argument passing - Returning objects - Recursion -
Introducing Access control - understanding static - Introducing final - Nested and
Inner classes - String class - Using command line arguments

Inheritance: Inheritance Basics - Using super - creating Multilevel
Hierarchy - Method overriding - Dynamic Method Dispatch - Using Abstract class
- Using final with inheritance - The object class

UNIT III

Packages and interfaces: Packages - Access Protection - Importing packages - Interfaces.

Exception Handling: Introduction - Exception Types - Uncaught Exceptions - Using try and catch - Multiple catch clauses - Nested try statements - throw - throws - finally - Java's Built - in Exception - creating your own Exception Subclasses

Multithreaded Programming: Java Thread Model -Main Thread - Creating a Thread - Creating Multiple Threads - Using is Alive() and Join() - Thread priorities - Synchronization - Interthread Communication - Suspending Resuming: and stopping Threads - Using Multithreading.

Unit IV

I/O, Applets and other topics: I/O Basics Reading console Input - writing console output - The PrintWriter class - Reading and Writing Files
The Applet class: Applet Basics - Applet Architecture - Applet Skeleton - Applet Display method - Requesting Repainting - HTML APPLET tag - Passing Parameters to Applet - Audio Clip Interface.

Event Handling: Event Handling Mechanisms - Delegation Event Model - Event classes (The Action Event Item Event, Key Event, Mouse Event) - Sources of Events - Event Listener Interfaces (Action Listener, Item Listener, Key Listener, Mouse Listener) - Adapter Classes

Unit V

Introducing the AWT: AWT Classes - Window fundamentals - working with Frame Windows - working with Graphics

Using AWT controls: Controls Fundamentals - Labels - using Buttons
- Applying check Boxes - Check Box group - Choice Controls - Using a Text field
- Using a Text Area - Understanding Layout Managers (Flow Layout Only) - Menu
Bars and Menus

Text book

The Complete Reference JAVA 2 5/E HERBERT SCHILDT

Reference Books

1. Programming with Java - C.Muthu
2. Programming with JAVA 2 - C.XAVIER
3. Introduction to OOP through Java - ISRD Group Tata McGraw hill
4. Programming with Java a primer 3/E E.BALAGURUSWAMY

CORE SUBJECT – 2

ESSENTIALS OF FINANCIAL ACCOUNTING

UNIT I:

Conceptual Framework: users of financial statements - Capital of a firm - Structure of Business firms - Objectives of Corporate Financial Reporting - Components of Financial Reporting - Accounting Conventions - Qualitative characteristics of financial statements - True and fair view - Internal control - Internal auditing - External auditing - Accounting policy and accounting standards - Accounting Estimates and events occurring after the balance sheet date.

Balance Sheet: Accounting equation - Balance sheet structure - Assets - Current assets - Non-current assets - Classification of assets under Indian GAAP - Liabilities - Current Liabilities - Non-current liabilities - Secured and unsecured liabilities - Classification of liabilities under Indian GAAP.

Unit II:

Structure of Profit and Loss Account: Nature of Profit and Loss Account - Expenditure and expense - Income - Accrual basis of Accounting - Structure of Profit and Loss Account Extraordinary items - Prior period items.

The Accounting Cycle: Journal, Cash Book, General Ledger and trial balance: Double entry book keeping; Debit - Credit rules - Accounting Cycle - Journalisation - petty Cash book general ledger - Trial Balance.

Unit III:

Completion of the Accounting Cycle: Preparation of profit and Loss account and Balance sheet : Introduction - Rectification of errors - adjustments - Provision for doubtful debts and discount - Provision for depreciation - Bank reconciliation statement - Tax expense, deferred tax asset and deferred tax liability - Preparation of Profit and Loss account - Closing entries.

Accounts of Limited liability companies: Accounting for shares and debentures: Introduction - Types of Share Capital - Debentures - Prospectus - Accounting for issue of shares - Alteration of Share capital - share split - Bonus shares - rights issue - buy back shares - redemption of preference shares - presentation of share capital in balance sheet - reserve and surplus - Accounting for debentures - SEBI guidelines for issue of debt instruments.

Unit IV:

Inventory Valuation: Inventories definition - Valuation of inventories: General principles - Inventory Costs - Use of standard cost method and retail method - Cost formula - Net Realizable value (NRV)

Fund flow and Cash flow statements : Introduction – Fund flow statement-cash flow statement.

Unit V:

Financial Analysis : Introduction - Accounting policy and quality of earnings - Earnings management - Potential Red flags - Common size Financial

statement - Ratio analysis: An introduction - Measurement of overall performance of a firm - Decomposing ROIC and ROCE: Turnover of assets and profitability - Decomposing, ROE: Gross gearing, effect of financial leverage and spread - assessing the operating management - assessing the solvency and liquidity - Ratios at a glance - uses of ratios for internal management - Capital market - based ratios.

Text book

Essentials of Financial Accounting - by Asish K.Bhattacharyya, P.H.I Private Limited

Reference Books

1. Dr. S. N. Maheswari, Management Accounting and Financial Control, Sultand Chand & Sons, New Delhi.
2. S.P. Jain and Narang - Cost Accounting, Principles and practices, Kalyani publishers, New Delhi.

CORE SUBJECT – 3 JAVA PRACTICAL LIST

1. Write a Java program to find the area of a square rectangle and triangle by
 - a. Overloading Constructor
 - b. Overloading Method
2. Define a class called student with data members name, roll number and age. Write a suitable constructor and a method output () to display the details. Derive another class student from student with data members height and weight. Write a constructor and a method output () to display the details which overwrites the super class method output() (apply method overriding concepts)
3. Write a java program to create a package "Employee" which contains the classes Emp and Emppay. The data members of Emp are name, emp_id, category, and Bpay. Write suitable constructor and methods to compute the net pay of the employee. The class Emppay contains the main method.
4. Write a java program to create and implement an interface
5. Write a java program to create a thread
 - a. Using Thread class

- b. using runnable interface
- 6. Write a java program to Design a calculator to perform arithmetic operations.
- 7. Create an applet with four checkboxes with labels and a Text area object. The program must display the details while clicking a particular checkbox.
- 8. Write a java program to demonstrate the use of choice box
- 9. Write a java program, which creates a window with a checkbox group with boxes for the colors, violet, indigo, yellow, orange, red, blue and green. When the button is selected the background color must change accordingly
- 10. Write a java program to throw the following exception
 - a. Negative Array Size
 - b. Array index out of Bounds
- 11. Write a java program to create a file menu with options New. Save and Close, Edit menu with option cut, copy and paste
- 12. Write a java program to illustrate mouse event handling

ALLIED SUBJECT – II

DATA STRUCTURES

Unit I

Introduction: Pseudo code – The Abstract Data Type-A Model for an Abstract Data Type – Algorithms Efficiency.

Searching: List Searches – Hashed List Searches- Collision Resolution

Unit II

Linked Lists: Linear List Concepts – Linked List Concepts – Linked List Algorithms – Processing a Linked List – Complex Linked List Structures

Unit III

Stacks and Queues: Basic Stacks operations – Stack Linked List Implementation – Stack Applications – Queue operations – Queue Linked List Design.

Unit IV

Trees: Basic Tree Concepts – Binary Trees – Binary Tree Traversals – Expression Trees – General Trees – Binary Search Trees – Heap Definition – Heap Structure – Basic Heap Algorithms – Heap data Structures – Heap Algorithm.

Unit V

Sorting And Graphs: General Sort Concepts – Quick sort – External sorts

Graphs: Terminology – Operations – Graph storage Structure – Networks.

Text book

Data Structures a Pseudo code Approach with C++, Richard F. Gilberg & Behrouz A forouzan, Thomson Brooks/Cole.

Chapters:1, 2.1, 2.3, 2.4, 3.1-3.4, 3.6, 4.1-4.3, 5.1, 5.2, 7.1-7.5, 8.1, 9.1-9.5, 11.1, 11.4 (Quick Sort only) 11.6, 12.1-12.5

Reference Books

1. Fundamentals of Data Structures Eilis Horowitz & Sartaj GalGotia Publications
2. Data Structures & Algorithm in Java third edition – Adam Drozdek.

ALLIED SUBJECT – II

DATA STRUCTURES – PRACTICAL LIST

1. Write a C++ program to implement sequential search and Binary search in array
2. Write a C++ program to implement linked list and perform the following operations
 - a. Add a node as first node

- b. Add a node as last node
3. Write a C++ program to implement linked list and implement the following operations
 - a. Delete the first node
 - b. Delete the last node
4.
 - a. Write a C++ program to implement a stack using Linear list Perform the push and pop operations.
 - b. Write a C++ program to implement a queue using circular list and implement add and delete operations.
5. Write a C++ program to implement binary tree using Linked and perform the following traversal
 - a. In order traversal
 - b. Pre order traversal
 - c. Post order traversal
6. Write a C++ program to implement graph using Adjacency matrix and perform the following operations
 - a. Depth First search
 - b. Breadth First search
7. Write a C++ program to implement merge sort
8. Write a C++ program to implement Quick sort

CORE SUBJECT-1

VISUAL BASIC

Unit I

Getting started with Visual Basic 6.0: Introduction to Visual Basic, Visual Basic 6.0 Programming Environment, Working with Forms, Developing an Application, Variables, Data types and Modules, Procedures and Control Structures, Arrays in Visual Basic, Additional examples.

Working with Controls: Introduction, Creating and Using Controls, Working with Control Arrays, Additional examples.

Unit II

Menus, Mouse Events and Dialog Boxes: Introduction, Mouse Events, Dialog Boxes, Additional examples.

Graphics, MDI and Flex Grid: Introduction, Graphics for Applications, Multiple Document Interface (MDI), Using the Flex Grid Control Additional examples.

Unit III

ODBC and Data Access Objects: Evolution of Computer Architectures, Data Access Options, Additional examples.

ODBC Using Data Access Objects and Remote Data objects: Open Database Connectivity (ODBC), Remote Data Objects, Additional examples.

Unit IV

Data Environment and Data Report: Introduction, Data Environment Designer, Data Report, Additional examples.

Object Linking and Embedding: Introduction, OLE Fundamentals, Using OLE Container Controls, Using OLE Automation Objects, OLE Drag and Drop, Additional examples.

Objects and Classes: Introduction to Objects, Working with Objects, Classes and Class Modules, Additional examples.

Unit V

Built - in Active X Controls: Working with Built - In Active X controls, Additional examples. Working with Active X Data Objects; An Overview of ADO and OLE DB, ADO Object Model, Additional examples.

Files, and File System Controls: Introduction, File System Controls, Accessing Files, Interface with Windows, Additional examples.

Text Book

Visual Basic 6.0 Programming - Content Development Group - Tata McGraw-Hill Publishing Company Limited, New Delhi. (Chapters: 1, 2, 3, 4, 5, 6, 7, 8, 9, 13, 16, 17)

Reference Books

1. Microsoft Visual Basic 6.0 Professionals, Michael Halvorson - PHI
2. Visual Basic 6 in Record Time by Steve Brown, BPB Publications.
3. Visual Basic 6 from the Ground UP - Gary Cornell - Tata McGraw Hill

CORE SUBJECT-2**VISUAL BASIC PRACTICAL LIST**

1. Design of an Analog Clock
2. Design of a Desktop Calculator
3. Design of a Color Mixer using basic colors
4. Create an application to format text inside a text box
5. Create an application using file controls and use two option buttons to show and hide a picture in the picture box.
6. Create an application to do Matrix Addition using Flex Grid Control
7. Create an Editor with File and Edit menus using menu Editor Tool
8. Create a MDI application with tile and cascade child forms
9. Create an application to implement OLE Drag & Drop
10. Create a mailing address database in Access and view the records using Data Control
11. Create a student database application using ADO
12. Create a student database in Access and prepare a Report using Data Report Control

MAJOR ELECTIVE PAPER SYLLABUS

CATEGORY- A (CHOOSE ANY ONE) MICROPROCESSOR

Unit I

Microprocessors, Microcomputers and Assembly Language:
Microprocessors - Microprocessor Instruction set and Computer Languages -
computers to single chip microcontrollers.

Mention to 8085 assembly language Programming - The 8085
programming model action Classification - Instruction, data format and storage -
How to write, store and execute simple program, Overview of 8085 instruction set
- Writing and assembling a program.

Unit II

Microprocessor Architecture and Micro Computer Systems:
Microprocessor Architecture and its operations - Memory - Input and output (I/O) -
Example of a Microcomputer system.

Microprocessor Architecture and Memory interfacing: The 8085 MPU
- Example 8085 based microcomputer - Memory interfacing - Interfacing the 8155
memory

Unit III

Data transfer operation: Arithmetic operations - Logic operations -
Branch operations - Writing assembly language programs - Debugging a program.
Programming techniques with additional Instructions: Programming techniques -
Counting and Indexing - Additional data transfer and 16 bit arithmetic operations -
Arithmetic operations related to memory - Logic operations related to memory -
Logic operation - Rotate - Dynamic debugging.

Unit IV

Counters and Time Delays: Counters Time Delays - Hexadecimal
counter - Modulo ten Counter – Pulse Wave forms - Debugging counter and time

delay programs. Subroutine : Stack - Subroutine - Restart - Conditional call and Return subroutine concepts.

Unit V

BCD to Binary conversion - Binary to BCD conversion - BCD to seven segment LED code conversion - BCD addition - BCD subtraction - Multiplication - Subtraction with carry.

Text Book

1. Ramesh S. Goanker - Microprocessor Architecture Programming and Applications with the 8085 - 5th Edition, Penram International Publisher
2. Microprocessors and Microcontrollers N.Senthil Kumar,M.Saravanan ,S.Jeevananthan . Oxford University Press.

Reference Book

1.8085 Microprocessor Programming and Interfacing N.K.Srinath, PHI Publication.

ELECTRONIC COMMERCE

Unit I

What is Electronic Commerce? - Types of Electronic Commerce Technology.

Unit II

Types of E--Business Models and Markets - Types of E-Commerce Providers and Vendors - E-commerce Website Creation

Unit III

Managing E-Commerce Web Site Development - Building Shopping Cart Applications - Mobile Electronic Commerce.

Unit IV

Enhancing a web server with E-Commerce Application Development
- Strategies, Techniques and tools - Implementing Merchandising Strategies -
Implementing E-Commerce Databases

Unit V

Applying and Managing E-Business Intelligence Tools for
Application Development - Types of Security Technologies - protocols for the
Public Transport of Private Information

Text Book

1. Electronic Commerce, by Pete Loshin and John Vacca, Fourth edition, Firewall Media, New Delhi.
2. E-Business Parag Kulkarni, Sunita Jahirabadkar, and Pradip Chande. Oxford University Press

Reference Books

1. Electronic Commerce, by Gary O.Schnelder James T.Perry, First edition 2000, Thomson Learning.
2. Electronic Commerce by Elias M.Awad, Prentice Hall of India 2002

COMPUTER NETWORKS

Unit-I

Network Hardware: LAN – WAN – MAN – Wireless – Home Networks. Network Software: Protocol Hierarchies – Design Issues for the Layers – onnection -oriented and connectionless services – Service Primitives – The Relationship of services to Protocols.

Reference Models: OSI Reference Model – TCP/IP reference Model – Comparison of OSI and TCP/IP – Critique of OSI and protocols – Critique of the TCP/IP Reference model.

Unit-II

Physical Layer - Guided Transmission Media: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. Wireless Transmission: Electromagnetic Spectrum – Radio Transmission – Microwave Transmission – Infrared and Millimeter Waves – Light Waves. Communication Satellites: Geostationary, Medium-Earth Orbit, Low Earth-orbit Satellites – Satellites versus Fiber.

Unit-III

Data-Link Layer: Error Detection and correction – Elementary Data-link Protocols – Sliding Window Protocols. Medium-Access Control SUB LAYER: Multiple Access Protocols – Ethernet – Wireless LANs - Broadband Wireless – Bluetooth.

Unit-IV

Network Layer: Routing algorithms – Congestion Control Algorithms.
Transport Layer: Elements of Transport Protocols – Internet Transport Protocols: TCP.

Unit-V

Application Layer: DNS – E-mail. Network Security: Cryptography – Symmetric Key Algorithms – Public Key Algorithms – Digital Signatures.

Textbooks

Computer Networks – Andrew S. Tanenbaum, 4th edition, PHI.(UNIT-I : 1.2-1.4, UNIT-II : 2.2-2.4, UNIT-III : 4.2-4.6 UNIT-IV : 5.2,5.3,6.2,6.5 UNIT-V : 7.1,7.2,8.1-8.4)

Reference Books

1. Computer Networks –Bhushan Trivedi, Oxford University Press.
2. Data Communication And Networks – Achyut Godbole, 2007, TMH.
3. Computer Networks Protocols, Standards, and Interfaces – Uyles Black, 2nd ed,PHI.

ALLIED SUBJECT – II

RESOURCE MANAGEMENT TECHNIQUES

Unit I

Why operations Research?: Introduction – Origin of operations Research - Definitions of Operations Research – Characteristics of Operations Research – Role of operations Research in decision –making – methods of solving operations research problem – phases in solving operations research problems – Typical Problems in operations Research – Scope of operations Research – Why to study operations Research.

Linear Programming: Introduction – Steps of formulation LPP – General Form of LPP – Simplex method.

Unit II

Game theory: Introduction – Two person Zero – Sum Games – maximin and minimax principles – mixed strategies, expected pay – off – solution of 2x2 mixed strategy game – solution of 2x2 mixed strategy game by the method

of oddments - Dominance principle – Graphical method for solving a $2 \times n$ or $m \times 2$ game.

Replacement models: Introduction – Failure of items – Replacement of items that deteriorate – Replacement of items with increasing running cost.

Unit III

Inventory Problems: Introduction - types of inventory costs involved in inventory problems – Notations – Economic order Quantity (EOQ) model with constant rate of demand – Limitations of the EOQ Formula – EOQ model with finite Replenishment rate – EOQ model with shortages – Order – Level, Lot – size system – Order – Level Lot – Size System with Finite Replenishment Rate – EOQ model with quantity discounts.

Unit IV

Project Management: Introduction - origin and use of PERT - Origin and use of CPM - Applications of PERT and CPM - Framework of PERT and CPM - Constructing the project network - Dummy Activities and Events - Rules for Network construction - Finding the critical path - Project Evaluation and Review Technique (PERT).

Unit V

Queuing Theory: Introduction - Queuing system - classification of Queuing models - Distribution of Arrivals (The poisson process) - pure Birth process - Distribution of Inter - Arrival Time - Distribution of Departures (Pure Death process) - Distribution of service time - Solution of Queuing models - Model 1 ($m/m/1$) : (FCFS) : Birth & Death Model.

Text Book

Operations Research, Nita H. Shah; Ravi M. Gor; Hardik Soni,
Prentice hall of India, 2008

Reference Books

1. Operations Research, P.K. Gupta, S. Chand & Company
2. Operations Research, R.Paneerselvam, Prentice Hall of India

SKILLED BASED SUBJECTS SYLLABUS

Skilled based subjects are practical oriented, One hour should be assigned for tutorial class and three hours of practical to do the given practical list.

OPTIONAL -1

DTP

Samples should be provided to the students for designing the given list.

Page Maker

1. Design of ID card (3"x2") / visiting card (3.5"x2")
2. Design of an attractive invitation card (5.5"x8") / letter pad (7.5"x9")
3. Preparation of a small booklet with 6 pages (3.6"x4.5")
4. Design a handbill (5.6"x8.5")/advertisement
5. Design your college progress card / a Receipt bill with counter foil.

Photoshop

1. Design of a brochure for an institution
2. Seasonal greeting card

3. Transporting an image from one background to another
4. Design a web page poster (1004x750) / Textbook cover page
5. Crop an image / rotate an image

OPTIONAL- 2

INTERNET FUNDAMENTALS

1. Finding the IP address of a system using DOS & Windows OS
2. Email Creation
3. How to configure Outlook Express
4. How to stop pop up / pop under Internet advertisements
5. How to enable / disable / delete Internet cookies
6. How to determine the speed of my Internet connection (Transfer rate when downloading a file)
7. Changing the home page of my browser
8. Creation of Internet favourites / book marks
9. How to install internet security
10. How to ping another node?
11. How to install the following web browsers. Opera, Firefox, Safari
12. Creation of simple web page

OPTIONAL 3

FLASH

1. Create a simple presentation
2. Embed a movie clip using script
3. Start a graphic animation at a specific frame

4. Text animation using motion tweening
5. Activate a new window / page using buttons
6. Bouncing ball with sound effect
7. Create a scrolling gallery in a page

DREAM WEAVER

1. Design a home page for a book store
2. Create a HTML document to display a list of five flowers and link each one to another document displaying brief description of the flower, Add pictures wherever possible
3. Write an HTML code to display a list of 5 cars in a frame, Link each one to a brief description in second frame. The left frame should display the list and the right frame should display the paragraph about the frame
4. Design a spry menu bar
5. Create a feedback form using spry validation
6. Create a simple CSS f

NON MAJOR ELECTIVE PAPERS SYLLABUS

INTRODUCTION TO INFORMATION TECHNOLOGY

UNIT 1

Information Technology Basics: Introduction, Information, Technology, Information technology, Present Scenario, Role of Information Technology, Information technology and internet, Careers in IT Industry.

Computer Organization and Architecture: Central Processing Unit, Inside a computer, Data representation in Computer, Coding Schemes.

Unit II

Computer Memory and Storage: Introduction, Memory Hierarchy, Random Access Memory (RAM), Read Only Memory (ROM), RAM, ROM and CPU interaction, Types of Secondary storage devices, Magnetic tape, Magnetic disk, types of magnetic disk, optical disk, type of optional disks.

Unit III

Input, Output Media: Introduction, types of input devices, types of output devices, Multimedia Essentials: Introduction, Multimedia definition, Building blocks of Multimedia, Multimedia system, Multimedia applications, Virtual reality.

Unit IV

The Internet: Introduction, Evolution of Internet - Basic Internet terms - Getting Connected to Internet - Internet Applications - Data over Internet.

Internet tools: Introduction - Web Browser - Browsing Internet using Internet Explorer - E-Mail - Search engines - Instant messaging.

Unit V

Emerging trends in IT: Introduction, E-Commerce - Electronic Data Interchange - Mobile Communication - Bluetooth - global Positioning System - Infrared Communication - Smart Card - Imminent Technologies.

Text Book

Introduction to Computers and Information Technology, D. Glory Ratha Mary, S. Selvanayahi, Shekina Publications.

Reference books

1. Introduction to Information Technology ITL Education Solutions Limited, Pearson Education.

2. Fundamentals of Information Technology By Alexis Leon & Mathews Leon
Vikas Publication - New Delhi.

INTRODUCTION TO COMPUTERS

Unit I

Computer Basics: Introduction, Characteristics of Computers - Evolution of Computers, Generation of Computers, Classification of Computers. The Computer System, Application of Computers.

Unit II

Computer Organization and Architecture: Central Processing Unit, Inside a computer, Data representation in Computer, Coding Schemes.

Unit III

Input / Output Units: Computer input units, Computer output units.

Unit IV

Computer Memory and Storage: Introduction, Memory Hierarchy, Random Access Memory (RAM), Read Only Memory (ROM), RAM, ROM and CPU interaction, Types of Secondary storage devices, Magnetic tape, Magnetic disk, types of Magnetic disk, Optical disk, Type of optical disks.

Unit V

Operating System: Introduction, Operation System: Definition, Evolution of Operating System, Types of Operating System, Functions of Operating System.

Computer Software: Introduction, Computer Software: Definition, Categories of Software, Installing and Uninstalling software, Software piracy, Software terminologies.

Text Book

Introduction to Computers and Information Technology, D. Glory
Ratna Mary, S. Selvanayahi, Shekina Publications.

Reference Books

1. Introduction to Computers, Peter Norton Tata McGraw Hill
2. Fundamentals of Information Technology By Alexis Leon & Mathews
Lean Vikas Publication - New Delhi

BASIC PROGRAMMING DESIGN

Unit I

Introduction: Algorithms, Flow charts, Types of Programming languages, Selection of Programming languages, Program writing, Debugging.

Unit II

Flow Charts - Elementary Concepts: Introduction, Kinds of flow charts, Symbols used in flow charts, Advantages of flow charts, Examples, Constants and variables.

Unit III

Flowcharting Simple Computations: Introduction, Illustrating examples, Conclusions.

Unit IV

Subscripted Variables: Introduction, basic concepts of subscripted variables, One dimensional array, Illustrating examples, Conclusions.

Unit V

Multidimensional Arrays: Introductions, Definitions, Matrix operations, Illustration examples, Beyond two dimensions, Conclusions.

Introduction to File Structure: Introduction, concept of data files, types of data files, file organization methods, file processing activities, conclusion.

Text book

Basic Programming Design D.S.Arul Selvan & A.A.Regieson Sylum
Shalom Publications, Green St., Nagercoil.

Reference book

Insight into Flow charting Raj K. Jain. By S. Chand & Company Ltd

MS WORD

Unit I

Introduction to Microsoft Word 2003.

Unit II

Creating a document in Microsoft Word 2003.

Unit III

Working with tables, Charts and Graphics – MAILMERGE.

Unit IV

Additional Commands of Microsoft Word 2003.

Unit V

Menu Commands of Microsoft Word 2003.

Text Book

Straight to the Point Microsoft Office Word 2003, Firewall Media

Reference books

1. Gini Courter & Annette Marquels – Microsoft Office 2000 No Experience required, BPB Publications.
2. Stephen L. Nelson – Office 2000: The complete reference, Tata McGraw Hill Publishing Company Limited.

APPENDIX – AZ68

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI – 627 012

B.Sc. BIOINFORMATICS (CBCS)

(Effective from the Academic Year 2012 – 2013 onwards)

Course Structure

Eligibility for admission

A pass with 50% marks in Higher Secondary (10+2) or any equivalent Examination with subjects in Biological Sciences.

I Semester

Part	Components	Hours	Credits
I	Tamil / Other Language (1 Course)	6	3
II	English (1 Course)	6	3
III	Core Subjects (2 Theory + 1 Practical)		
	Theory		
	1. Cell Biology and Genetics	4	4
	2. Basics of Computer	4	4
III	Practical		
	1. Lab in Cell Biology and Genetics	2	2
IV	Allied Subject 1 (1 Course)		
	Theory : Programming in C	4	4
	Practical : Lab in Programming in C	2	--
V	Environmental Studies (1 Course)	2	2
	Total (6 Courses)	30	22

II Semester

Part	Components	Hours	Credits
I	Tamil / Other Language (1 Course)	6	3
II	English (1 Course)	6	3
III	Core Subjects (2 Theory + 1 Practical)		
	Theory		
	3. Molecular Biology	4	4
	4. Biomolecular Structure	4	4
III	Practical		
	2. Lab in Molecular Biology	2	2
IV	Allied Subject 2 (1 Course)		
	Theory : Programming in Visual Basic	4	4
	Practical : Lab in Programming in Visual Basic	2	2
V	Valued Based Education (1 Course)	2	2
	Total (6 Courses)	30	24

III Semester

Part	Components	Hours	Credits
I	Tamil / Other Language (1 Course)	6	3
II	English (1 Course)	6	3
III	Core Subjects (1 Theory + 1 Practical) Theory 5. Introduction to Bioinformatics	4	4
	Practical 3. Lab in Bioinformatics	2	2
III	Skill Based Subjects (1 Theory) 6(a) Programming in PERL (OR) 6(b) Programming in PHP	4	4
IV	Allied Subject 3 (1 Course) Theory : Basic Mathematics	4	4
	Practical: Lab in Mathematics using SciLab	2	--
V	Non-Major Elective (1 Theory) 1(a) Fundamentals of Computer and Networks (OR) 1(b) Basics of Bioinformatics	2	2
Total (6 Courses)		30	22

IV Semester

Part	Components	Hours	Credits
I	Tamil / Other Language (1 Course)	6	3
II	English (1 Course)	6	3
III	Core Subjects (2 Theory + 1 Practical) Theory 7. Basics of Genomics and Proteomics	4	4
	Practical 4. Lab in Genomics and Proteomics	2	2
III	Common Skill Based Subjects (1 Theory) 8(a) Effective Communication (OR) 8(b) Personality Development	4	4
IV	Allied Subject 4 (1 Course) Theory : Biostatistics	4	4
	Practical: Lab in Biostatistics using SPSS/STATA/Excel	2	2
V	Non-Major Elective (1 Theory) 2(a) Biological Database and Sequence Analysis (OR) 2(b) Applied Bioinformatics	2	2
Total (6 Courses)		30	24

Semester - III
Core 5: Introduction to Bioinformatics

Unit I:

Introduction to Bioinformatics: Definition and Scope of Bioinformatics, Applications of Bioinformatics in various areas, Overview of available Bioinformatics Resources on the Web, Proteome and Genome; Information Resources and Analysis Tools; Established Techniques and Methods; Sequence File Formats FASTA, GenBank and Structured File Formats.

Unit II:

Biological Databases: Protein Sequence and Structural Databases, Nucleotide Sequence Databases; NCBI, PubMed, Protein Data Bank (PDB), PIR, SwissProt, EMBL, GenBank, DDBJ, UniGene, SGD and EMI Genomes. Specialized Databases: Pfam, SCOP, GO, GenBank, Genome Net, EST, SNP, Metabolic Pathways Databases, EMBL, Similar Sequence Search BLAST, Gene/Protein Sequences and its Implications. Sequence Alignment: Pair-wise Alignments, Scoring Matrix, PAM, BLOSUM and Gap Penalty.

Unit III:

Secondary Structure Analysis Tools/Server: Sequence Motif Databases, Pfam, PROSITE, Protein Structure Classification; SCOP, CATH, Other Relevant Databases, KEGG, PQS, PMDB, MPDB. Protein Structure Alignments; Structure Superposition, RMSD, Different Structure Alignment Algorithms, DALI, and TM-align.

Unit IV:

Methods of Sequence Analysis: Heuristic Methods; FASTA, Statistics of Sequence Alignment Score; E-Value, P-Value, Multiple Sequence Alignments; ClustalW, Profile, Profile-Sequence Alignment, Profile-Profile Alignment, PSI-BLAST, Hidden Markov Models, Viterbi Algorithm and HMM Based Multiple-Sequence Alignment.

Unit V:

Phylogenetic Analysis: Distance and Character Based Methods and Software, Computing Tools for Phylogenetic Analysis, Distances, GROWTREE, PAUP, PHYLIP and MEGA; Construction and Visualization of Phylogenetic Tree; and Application of Phylogenetic Analysis.

REFERENCES:

1. Anna Tramontano, 2007; "Introduction to Bioinformatics", Chapman and Hall Series.
2. Jason T.L .Wang, Mohammed J. Zaki, Hannu T.T. Toivonene and Dennis Shasha, 2005; "Data Mining in Bioinformatics", Springer International Edition.
3. Yi-Ping Phoebe Chen, 2007; "Bioinformatics Technologies", Springer International Edition.

4. Mount, D.W., 2001; “Bioinformatics: Sequence and Genome analysis”, Cold Spring Harbour Laboratory Press.

Core Practical 3: Lab in Bioinformatics

1. Search on NCBI – PubMed bibliographic search – different options – author name, keyword in title, abstract, title and/or abstract, related articles – different display options
2. Search on EMBL for nucleic acid sequences
3. Perform a similarity search of PIR & SwissProt database for the given protein sequence
4. Pairwise sequence alignment by LALIGN tool
5. Sequence similarity search using NCBI-BLAST tool
6. Computation of protein sequence features using PROTPARAM tool
7. Retrieving genomic information using GOLD database
8. Structure exploration using PDB
9. Structure visualization using RASMOL & PYMOL software
10. To list SCOP lineages and CATH architecture description for a set of proteins
11. Perform multiple sequence alignment using ClustalW, and display the phylogenetic relationship of sequences in NJplot

Skill Based Subjects 6(a): Programming in PERL

Unit I:

Introduction: History of Perl, Availability, Support, Versions, Installation. Basic Concepts, Significance of Perl in Bioinformatics.

Unit II:

Basics Constructs: Scalar Data, Numbers, Strings, Scalar Operators, Scalar Variables, Scalar Operators and Functions. Arrays and List Data: What is a List or Array? Literal Representation, Variables, Array Operators and Functions, Scalar and List Context. Hashes: What is a Hash? Hash Variables, Literal Representation of a Hash, Hash Functions, Hash Slices. Control Structures: Statement blocks, Loops and conditions. Basic Input / Output.

Unit III:

Advance Constructs and Features: Regular Expressions: Concepts about Regular Expressions, Simple Uses of Regular Expressions, Patterns, Matching Operator, Substitutions, The split and join functions, Subroutines: System and User Functions, The local Operator, Variable-length, Parameter Lists, Lexical Variables, File handles and File Tests: File Handle, Opening and Closing a File handle, Using Pathnames and Filenames, die, Using File handles.

Unit IV:

Object-Oriented Perl: Introduction to Modules, Creating Objects and References. CGI Programming: The CGI.pm Module, CGI Program in Context, Simple CGI Programs, Passing Parameters via CGI, Perl and the Web.

Unit V:

BioPerl: BioPerl Overview and Installation Procedures; Fundamental Constructs and Special Features; BioPerl Modules, Creating BioPerl Objects. Applications of BioPerl, Utility and its Applications.

REFERENCES:

1. James D. Tisdall, 2001; "Beginning Perl for Bioinformatics", O'Rilley and Association.
2. Cynthi Gibas & Per Jamesbeck, 2000; "Developing Bioinformatics Computer Skills", O'Rilley & Association.
3. Harshawardhan P Bal, 2003; "Perl Programming for Bioinformatics", Tata McGraw Hill.
4. Randal L. Schwartz and Tom Phoenix, 2005; "Learning Perl", 3rd Edition, O'Rilley.

Skill Based Subjects 6(b): Programming in PHP**Unit I:**

What is PHP? History of web programming; how PHP fits into the web environment; installation and configuration; "Hello World"; syntax, variables, operators, flow control structures; More language basics; using GET and POST input, working with HTML forms; built-in and user-defined functions; variable scope; using the PHP manual, getting help

Unit II:

Input validation, string manipulation and regular expression functions; Date and time functions code re-use, `require()`, `include()`, and the `include_path`; filesystem functions and file input and output; file uploads; error handling and logging; sending mail

Unit III:

HTTP headers and output control functions; HTTP cookies; maintaining state with HTTP sessions; writing simple web clients Introducing MySQL; database design concepts; the Structured Query Language (SQL); communicating with a MySQL backend via the PHP MySQL API

Unit IV:

More MySQL database access; graphic manipulation with the GD library; Introduction to Object Oriented Programming; OOPs Instance Method; CakePHP

Unit V:

Using PEAR packages; More PEAR packages; the Smarty template engine; parsing XML; PHP 5-specific feature; PHP AJAX - XML, JSON

REFERENCES:

1. PHP 6/MySQL Programming for the Absolute Beginner by Andrew B. Harris.
2. <http://www.php.net/>

Allied 3: Basic Mathematics

Unit I:

Matrices: Matrix algebra – Types of matrices – determinant – inverse, rank of matrix – existence and uniqueness of solution of simultaneous equations – Eigenvalues and Eigenvectors – Cayley Hamilton's Theorem (statement only) – Symmetric, Skew Symmetric, Orthogonal, Hermitian, Skew Hermitian, & Unitary Matrices - Diagonalisation of matrix – Applications

Unit II:

Vectors: Vector algebra - addition and subtraction of vectors – product of vectors, dot & cross products - scalar triple product.

Unit III:

Vector differentiation –velocity & acceleration-Vector & scalar fields –Gradient of a vector- Directional derivative – divergence & curl of a vector solenoidal & irrotational vectors – Laplacian double operator –simple problems

Unit IV:

Basic differentiation of algebraic and trigonometric functions – Maxima and Minima - Integration of simple functions - Integration by parts – definite integrals - reduction formula – Table of integrals

Unit V:

Differential equations – First order differential equations – Second order differential equations with constant coefficients – Application to simple harmonic oscillator.

REFERENCES:

1. T.K.Manicavachagam Pillai & others, Differential Calculus, S.V Publications, Chennai, 1985 Revised Edition.
2. S.Arumugam & A.Thangapandi Issac, Modern Algebra, New Gamma Publishing House, 2000.
3. M.L. Khanna, Vector Calculus, Jai Prakash Nath and Co., 8th Edition, 1986.
4. T.K.Manickavasagam Pillai & others, Integral Calculus, SV Publications.
5. S.Narayanan, Differential Equations, S. Viswanathan Publishers, 1996.

Allied Practical 3: Lab in Mathematics using SciLab

1. Perform all matrix operations
2. Compute Eigen values and Eigen vectors of a given matrix
3. Verify Cayley-Hamilton Theorem for a given matrix
4. Perform vector addition, subtraction, dot and cross products.
5. Compute angle between two vectors
6. Perform differentiation of simple functions.
7. Compute maxima and minima
8. Perform integration of simple functions.

Non Major Elective 1(a): Fundamentals of Computer and Networks

Unit I:

Fundamentals of computers – Block diagram of computer (input and output devices) – History - Generations – Memory devices - Advantages and Limitations of Computers – Comparison of different operating systems DOS, Windows NT & XP, Application Softwares.

Unit II:

Communication Technology – Networking Elements: Networking Hardware, Networking services: Types of Networks – LAN, WAN & MAN, Intranet–Wireless communication – Internet services, Uses of Internet

Unit III:

Fundamentals of database - Database models (Hierarchical, Network, Relational and Object-Oriented Models) – RDBMS: Relational Database Management systems - Database System Applications and Security.

Unit IV:

Algorithm – Flowchart – Programming language – Compiling and Linking – Testing and Debugging – Documentation – Maintenance - Utility programs.

Unit V:

Web Services – WWW, URL, Servers: Client / Server essentials - Domain Name Server, FTP server, E-mail server, WEB servers, Web publishing – Browsers - IP Addressing, IPv6.

REFERENCES:

1. Basic Computer Skills made easy, by Sherman, J., 2001 Butterworth-Heinemann Ltd, USA
2. Computer Fundamentals and Applications (2nd Ed.) by Balaguruswamy, E., 1985, Tata McGraw-Hill Publishing Co. Ltd.
3. Peter Norton, *Peter Norton's Introduction to Computers*, Fifth Edition Student Edition with Electronic Workbook CD-ROM, McGraw-Hill Technology Education, 2003.

Non Major Elective 1(b): Basics of Bioinformatics

Unit I:

Bioinformatics – An overview, Definition & History; Information Networks – Internet in Bioinformatics – Bioinformatics databases & tools on the Internet.

Unit II:

Biological Sequence analysis – Pairwise sequence comparison – Sequence queries against biological databases – BLAST and FASTA algorithm - Multiple sequence alignments - Phylogenetic alignment.

Unit III:

Introduction to –omics, Genomics and Proteomics – Sequencing genomes – Genome databases on the web.

Unit IV:

Proteins – Amino acids – Peptide bond – Levels of protein structure – α -helix, β -sheet and β -turns – Ramachandran Map – Super secondary structures – Domains – quaternary structure – DNA and RNA structure – Watson and Crick model – A, B and Z forms of DNA – RNA secondary structure.

Unit V:

Protein structure visualization tools – RasMol, Swiss PDB Viewer, PyMol – Protein structure prediction tools, Molecular modeling and docking tools.

REFERENCES:

1. T.K. Attwood and D.J. Parry-Smith, Introduction to Bioinformatics, Pearson Education Ltd., New Delhi (2004).
2. D.R. Westhead, J.H. Paris and R.M. Twyman, Instant Notes: Bioinformatics – Viva Books Private Ltd, New Delhi (2003).
3. Arthur M. Lesk, Introduction to Bioinformatics, Oxford University Press, New Delhi (2003).
4. D. Higgins and W. Taylor (Eds), Bioinformatics - Sequence, structure and databanks, Oxford University Press, New Delhi (2000).

Semester - IV
Core 5: Basics of Genomics and Proteomics

Unit I:

Human genome-physical structure and genetic content-Genome structure and anatomy of prokaryotic and eukaryotic genome-nuclear genomes-organelle genomes

Unit II:

Repetitive DNA - sequence repeats - transposable elements - pseudo genes - Comparative genome analysis - genome databases – organisms - specific databases - Genome analysis and annotation

Unit III:

Genomes of model organisms - E.coli - Saccharomyces cerevisiae - Arabidopsis thaliana- Caenorhabditis elegans - Drosophilla melanogaster – Human – SNP Evolution of genomes- Bioinformatics approaches for metabolic pathways

Unit IV:

Proteomics introduction - Protein sequencing - 2D gel electrophoresis and Mass spectra -Tools for proteome technology - Protein identification from 2D gel, mass spectra and sequence data- Protein identification programs - Muscot - Peptident

Unit V:

Proteome databases and Resources - Comparative proteomics methods - 2D gel databases - Protein interaction data bases - Metabolic pathway databases

REFERENCES:

1. A. Baxevanis and B.F. Ouellette. Bioinformatics: A practical Guide to the Analysis of Genes and Proteins, 2nd & 3rd Editions, Wiley- Interscience, Hoboken, NJ, 2002 & 2005.
2. T. A. Brown, Genomes, 2nd Edition, BIOS Scientific Publishers, Ltd., Oxford, UK, 2002.
3. David W. Mount, Bioinformatics – Sequence and Genome analysis, Cold Spring Harbor Laboratory Press, New York, 2001.
4. C.W.Sensen, Essentials of Genomics and Bioinformatics, Wiley-VCH, 2002
5. S.R.Pennington and M.J.Dunn, Proteomics, Viva Books Pvt. Ltd., New Delhi, 2002.

Core Practical 3: Lab in Genomics and Proteomics

1. Bacterial operon prediction by OperonDB tools
2. Gene prediction by WebGene, ORF finder and COG database and GenoCluster software
3. Promoter and regulan prediction by Virtual FootPrint
4. Identification of coding region by CRITICA and CodanDB tools
5. Identification of mutations in genes by GeneSNP-VISTA software
6. Recombination frequency analysis by MEGA, RAS and RAT software

7. Metabolic pathway prediction by UB-BBD and Pathway Hunter Tool
8. Protein bulk properties prediction by WinGene/WinPep software
9. Protein modification site prediction by GlyMod, PhosMod, AceMod tools and WinPep software
10. 2D gel data analysis by SWISS-2D GEL DB and NCI Flicker web server/software

Allied 4: Biostatistics

Unit I:

Nature of biological and clinical experiments – collection of experimental data – Frequency distribution and Graphical representation of data – Descriptive statistics - Measures of central tendency – mean (AM, GM, HM) - median – mode – percentiles – Box plot.

Unit II:

Measures of dispersion - range, mean deviation, variance, standard deviation, coefficient of variance – skewness – kurtosis – Using statistical packages (Microsoft Excel or SPSS).

Unit III:

Correlation analysis: Types of correlation- Methods of studying correlation: Karl Pearson's coefficient of correlation and Rank correlation coefficient; Regression analysis: Regression line and equations – Simple problems based on biological data.

Unit IV:

Tests of Significance: Small sample tests – Students't test for mean, difference of two means and test for Correlation – Chi Square test for goodness of fit – F test for equality of variance.

Unit V:

Basic concepts of Probability – Sample space and events – Addition and Multiplication theorem – Theoretical distribution: Binomial, Normal and Poison.

REFERENCES:

1. Sokal R.J. and Roff. S.J., Introduction to Biostatistics, W.H.Freeman, London, 1981.
2. Zar, J.H., Biostatistical analysis, McGraw Hill, London, 1983.
3. S.C. Gupta, and V.K.Kapoor, Fundamentals of mathematical Statistics, S. Chand and Sons, New Delhi, 2002.

Allied Practical 4: Lab in Biostatistics using SPSS / STATA / Excel

1. Measures of central tendency – mean (AM, GM, HM) - median – mode
2. Measures of dispersion - range, variance, standard deviation, coefficient of variance
3. Karl Pearson's coefficient of correlation
4. Regression line and equations
5. Student 't' test
6. Chi square test
7. F-test
8. Plotting curves

Non Major Elective 2(a): Biological Database and Sequence Analysis

Unit I:

Literature Databases:

PubMed, BioMed, Google Scholar, PMC, Quertle

Unit II:

Sequence Databases:

Nucleic acid sequence databases: GenBank, EMBL, DDBJ, UniGene,

Protein sequence databases: Uniprot-KB: SWISS-PROT, TrEMBL, PIR-PSD

Repositories for high throughput genomic sequences: EST, STS GSS, etc.

Genome Databases at NCBI, EBI, TIGR, SANGER

Viral Genomes

Archeal and Bacterial Genomes;

Unit III:

Structural Databases:

3D Structure Database: PDB, NDB, CSD, MMDB,

Chemical Structure database: PubChem, DrugBank, ChemSpider,

Gene Expression database: GEO, SAGE,

Unit IV:

Derived Databases:

Sequence: InterPro, Prosite, Pfam, ProDom, Gene Ontology

Structure classification database: CATH, SCOP, FSSP, DSSP, HSSP

Protein-Protein interaction database: STRING

Unit V:

Database Access & Analysis Tools:

Keyword-based searches using tools like ENTREZ and SRS

Sequence-based searches: BLAST and FASTA

Structure-based searches: BLAST with PDB.

REFERENCES:

1. T.K. Attwood and D.J. Parry-Smith, Introduction to Bioinformatics, Pearson Education Ltd., New Delhi (2004).
2. D.R. Westhead, J.H. Paris and R.M. Twyman, Instant Notes: Bioinformatics – Viva Books Private Ltd, New Delhi (2003).

Non Major Elective 2(b): Applied Bioinformatics

Unit I:

Commercial bioinformatics – Survey of bioinformatics companies in India and abroad – Economics prospects – pharma-informatics – combinatorial chemistry – HT screening – in silico screening - from lead to commercialization.

Unit II:

Sequence assembly and Finishing methods - Sequence assemblers – finishing and visualization programmes - SNP – Types - SNP discovery methods.

Unit III:

Application of genomics to agriculture - gene discovery and gene function - model systems – technologies -methods to introduce novel genes – Pharmaceutical bioinformatics and drug discovery – Introduction - novel gene discovery - methods for identifying novel targets - protein classification and functional assignments – Disease - target gene relationship.

Unit IV:

Intellectual Property Rights(IPR): IPR - Importance of IPR, Organization - WIPO & WTO - Agreements and Treaties - GATT-TRIPS - Types of IPR – patents – copyrights - trademarks and trade secrets - IPR in India - IPR impacts on Biotechnology Research in India - significance biotechnological patents in India..

Unit V:

Biosafety & Bioethics: Biosafety - Topics of concern - Hazards of Genetically Engineered Microorganisms – Bioremediation - Framework of biosafety regulations in India – Bioethics - The ethical and social impacts of biotechnology and bioinformatics.

REFERENCES:

1. T. A. Brown, Genomes, 2nd Edition, BIOS Scientific Publishers, Ltd., Oxford, UK, 2002.
2. S.R.Pennington and M.J.Dunn, Proteomics, Viva Books Pvt. Ltd., New Delhi, 2002.

3. N.R.Subbaram, What everyone should know about patents?, 2nd Edition, Pharma Book Syndicate, Hyderabad, 2006.
4. Philip W.Grubb, Patents for Chemicals, Pharmaceuticals and Biotechnology-Fundamentals of Global Law practices and strategy, 4th Edition, Oxford University Press, 2006.
5. R.C. Dubey, A Textbook of Biotechnology, S.Chand & Company, 1993.
6. Ben Mephram, Bioethics-an Introduction for the biosciences, Oxford University Press, 2005

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

B.A. Economics

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem.	Pt. I/II /III /IV	Sub. No.	Subject status	Subject Title	Hrs./ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	I	13	Language	TAMIL/OTHER LANGUAGE	6	3	25	75	100	30	40
	II	14	Language	ENGLISH	6	3	25	75	100	30	40
	III	15	Core - 5	MATHEMATICAL METHODS - I	6	5	25	75	100	30	40
	III	16	Allied -III	INTERNATIONAL ECONOMICS -I	6	5	25	75	100	30	40
	III	17	Skilled Based subject -I	ECONOMICS OF SALESMANSHIP	4	4	25	75	100	30	40
	IV	18	Non-Major Elective -I	ECONOMICS FOR COMPETITIVE EXAMINATIONS	2	2	25	75	100	30	40
	Subtotal				30	22					
IV	I	19	Language	TAMIL/OTHER LANGUAGE	6	3	25	75	100	30	40
	II	20	Language	ENGLISH	6	3	25	75	100	30	40
	III	21	Core - 6	MATHEMATICAL METHODS - II	6	5	25	75	100	30	40
	III	22	Allied -IV	INTERNATIONAL ECONOMICS - II	6	5	25	75	100	30	40
	III	23	Skilled Based subject -II	ENTREPRENEURIAL DEVELOPMENT	4	4	25	75	100	30	40
	IV	24	Non-Major Elective -II	ISSUE IN INDIAN ECONOMY	2	2	25	75	100	30	40
	V	-	Extension Activity	NCC,NSS, YRC, YWF		1					
	Subtotal				30	23					

MATHEMATICAL METHODS – I

UNIT – I NUMBER SYSTEM

Number System – Algebraic Expressions – Sequences and series – Graphs – Application of Graphs in Economics.

UNIT –II SET LANGUAGE

Set – Meaning – Types of sets – Set operations – Venn diagram – Cartesian products

UNIT – III FUNCTIONS AND EQUATIONS

Functions – Types and application of functions in Economics – Equations – Types of Equations (Linear, Quadratic and Polynomial) Solving linear and Quadratic Equations – Application of Equations in Economics.

UNIT – IV ANALYTICAL GEOMETRY

Distance between two points in a plane – Slope of a straight line. Different types of Equations of a straight line- Intersection of two lines – perpendicular lines – Application of Straight lines in Economics.

UNIT – V COMMERCIAL ARITHMETICS

Percentage – Ratio and proportion – Simple Interest – Compound interest – Annuities – Depreciation – Discounts – Banker's Discount – True Discount.

REFERENCE:

1. Mathematical Methods – Dr. Bose
2. Mathematics for Economics – D.R Agarwal

INTERNATIONAL ECONOMICS - I

Unit I Introduction:

Foreign Trade – Meaning –Need-Difference between Internal Trade and International Trade – Merits and Demerits of International Trade.

Unit II Theories of International Trade :

Adam Smith – Ricardo Haberler Theory.

Unit III Free trade Vs Protection

Free Trade: Meaning - Case for and against Free Trade. Protection: Meaning - Arguments for and against protection.

Unit IV Tariff and Quotas

Meaning and types - Effects of Tariff. Quotas: Meaning and Types - Effects of quotas on imports.

Unit V Balance of payment

Meaning - Structure - Balance of Payment and Balance of Trade - Disequilibrium in BOP and BOT - Causes for disequilibrium in BOP - Measures for correcting disequilibrium.

BOOKS FOR REFERENCE:

1. Jhingan.M.L : International Economics
2. Cherunilam Francis : International Economics
3. Sankaran .S : International Economics

ECONOMICS OF SALESMANSHIP

UNIT-I - Salesmanship :

Salesmanship Definition –Is salesmanship a science , an Art or a Profession ?Creative Salesmanship and Competitive Salesmanship .Sales organization –Organisation of Sales Department.

UNIT-II – Sales Manager :

Duties of Sales Manager –Sales Supervision –Salesman’s Report .Selection and Training of Salesmen.

UNIT-III - Sales Territories :

Sales territories –Sales Quotas-Sales personality. Important Personality Traits.

UNIT-IV- Knowledge of Goods:

Knowledge of goods –Methods of acquiring product knowledge, Important Buying motives .

UNIT-V – Presentation & Demonstration :

Effective presentation and demonstration .Overcoming objections and closing the sales.

Reference :

1. Principles of Marketing – J.C. Simha.
2. Marketing Management – Philip Cotler
3. Marketing - Rajan Nayan
4. Marketing Managemen - Memonio and Joshi.

ECONOMICS FOR COMPETITIVE EXAMINATIONS

Unit – I Introduction to economics

Meaning and scope of economics – basic concepts in Economics – Human wants – Goods – Utility – Value – Price – Income – wealth – Welfare – Market – Supply – Demand -Cost – Revenue-Capital.

Unit – II Consumption

Meaning of the terms – consumer – consumption – utility maximization – Law of diminishing Marginal utility – Law of Demand – Law of Equimarginal Utility – The concept of Consumer’s Surplus.

Unit – III Production and distribution

Meaning of the terms – producer – production – Factors of production – law of returns - Meaning of the terms – Rent, wages, interest, profit.

Unit – IV Product pricing

Perfect competition – Imperfect Competition – Monopoly – Oligopoly.

Unit – V Investment

Meaning of the term investment – Investment opportunities in shares, Bank Deposits, Real estates, Small savings schemes, insurance schemes, investment in companies and investment in gold.

Reference

1. Micro Economics - M.L.Seth
2. Principles of Economics - K.P.M.Sundaram
3. Advanced Economic Theory - M.L.Juigan
4. Micro Economics - H.L.Ahuja.

MATHEMATICAL METHODS – II

UNIT – I DIFFERENTIATION AND ITS APPLICATION

Meaning – Rules of derivatives – Higher order derivative- Maxima and Minima – Application of Derivatives in Economics.

UNIT – II PARTIAL DERIVATIVES AND ITS APPLICATION

Meaning – Rules of Partial Derivatives- Euler's Theorem – Application of Partial derivatives in Economics.

UNIT – III INTEGRATION AND ITS APPLICATION

Meaning- types of Integrals – rules of integration – Definite Integrals – Application of Integrals in economics – Consumer's Surplus – Producer's Surplus.

UNIT – IV MATRICES AND DETERMINANTS

Meaning – Order of a Matrix – types of Matrices – Matrix operations – Integration by Substitution - Determinants – properties of Determinants – inverse of a Matrix – Solving the Equations (Cramer's rule).

UNIT – V APPLICATIONS OF MATRICES IN INPUT – OUTPUT ANALYSIS

Input – Output Analysis – Meaning – basic Concepts – assumptions – applications of Matrices in two and three sector economy – Linear programming – meaning – basic concepts and notations – Graphical Solutions.

Books for Reference :

1. Mathematical Methods –Dr.Bose, Himalaya Book Publications , New Delhi.
2. Mathematical & Statistical for Economics – G.S. Mongia
3. Mathematics for Economists – Mehtat Midhani
4. Mathematics for Economists – R.G.D.Allen.

INTERNATIONAL ECONOMICS - II

Unit I: Tariff and Quotas

Meaning and types - Effects of Tariff. Quotas: Meaning and Types - Effects of quotas on imports.

Unit II: Terms of Trade

Terms of Trade - different Concepts of Terms of Trade - Determinants of Terms of trade – Terms of trade and economic development. Dumping and Anti – Dumping Measures.

Unit III: International Financial Institutions

IMF –objectives – functions –organisation and structure - World Bank (IBRD) organisation and structure – objectives – functions - IFC, IDA and ADB.

Unit IV: International trade Agreements

GATT - Structure - Objectives, GATT and developing Countries. WTO - Structure - Objectives –functions – Agreement on agriculture, TRIPS, TRIPS.

Unit V: Recent Trends in India's Foreign Trade

Features of foreign trade – Volume – Composition – Direction of foreign trade.

Books for Reference:

1. Mithani, D.M. : International Economics
2. Jhingan. M.L. : International Economics
3. Vaish .M.C. : International Economics
4. Cherunilam Francis : International Economics
5. Mannur , H.G. : International Economics
6. Sankaran,S. International Economics

ENTREPRENEURIAL DEVELOPMENT

Unit-I: Entrepreneurship

Definitions of Entrepreneurship- Types of Entrepreneurs-Characteristics of an Entrepreneur-Kao's Conceptual model of Entrepreneurs-Growth of Entrepreneurship in India.

Unit-II: Entrepreneurial Motivation

The motivating factors –David McClelland's Achievement Motivation Theory -Search and Source of business idea .

Unit-III: Women Entrepreneurship

Concept of women entrepreneur-Functions of women entrepreneur-Growth of women entrepreneurship in India.-Problems of women entrepreneurs-Development of women entrepreneurship.

Unit-IV: Promoting And Starting An Industrial Unit

Nature and types of promoters – Steps to start a small scale industry –Incentives and Subsidies available.

Unit-V: Institutions For Entrepreneurial Development

District Industries Centre –State Industries Corporation –Industrial Development Corporation (SIDCO) in Tamil Nadu -National Small Industries Corporation –Industrial and Technical Consultancy.

Reference:

1. Entrepreneurial Development by Dr.S.S.Khanka
2. Entrepreneurial Development by Dr. Radha.
3. Entrepreneurship Development by E.Gordon K .Natarajan

ISSUES IN INDIAN ECONOMY

Unit I - Characteristics Of Indian Economy :

Features of Indian Economy – Mixed Economy – Dualistic Economy.

Unit II – National Income:

Components of National Income –Circular flow of Income in two sector Economy –
Measurement of National Income – Problems of Measurement of National Income in India.

Unit III – Demographic Issues :

Demographic Profile of India – Causes and Consequences of over population in India-
Population policy in India –Theory of Demographic Transition and India.

Unit IV – Structural And Development Issues :

Poverty in India – Causes and Consequences of Poverty-Types of Unemployment – Cause
and Consequences of Unemployment in India.

Unit V – Monetary And Fixed Issues :

- a) RBI and its functions – Commercial Banks in India – Nationalisation of Commercial
Banks – Monetary Policy in India
- b) Fixed Policy in India – Types of Budgets – Control State relationship in India.

Reference Books :

1. Indian Economy Dutt and Sundharam.
2. Indian Economy Misra & Puri
3. Indian Economy I.C.Dhingra.
4. Indian Economy Agarwal.

MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI
 UG COURSES – AFFILIATED COLLEGES

B.A. English with Computer Applications

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(45th SCAA meeting held on 09.02.2017)

Sem.	Part I/II/ III/IV	Sub. No	Subject Status	SUBJECT TITLE	Hrs/ Week	Cre- dits	Marks				
							Maximum			Passing Minimum	
							Int.	Ext.	Tot	Ext.	Tot.
III	I	13	Language	TAMIL/OTHER LANGUAGE	6	3	25	75	100	30	40
	II	14	Language	ENGLISH	6	3	25	7	100	30	40
	III	15	Core- 5	BRITISH POETRY	6	5	25	5	100	30	40
	III	16	Allied - III	PAGEMAKER AND PHOTOSHOP	6	5	25	75	100	30	40
	III	17	Skilled Based Subject-I	PHONETICS AND SPOKEN ENGLISH	4	4	25	75	100	30	40
	IV	18	Non Major Elective-I	ENGLISH FOR EMPLOYABILITY	2	2	25	75	100	30	40
SUB TOTAL					30	22					
IV	I	19	Language	TAMIL/OTHER LANGUAGE	6	3	25	75	100	30	40
	II	20	Language	ENGLISH	6	3	25	7	100	30	40
	III	21	Core- 1	BRITISH DRAMA	6	5	25	5	100	30	40
	III	22	Allied - II	CORAL DRAW	6	5	25	75	100	30	40
	III	23	Skilled- Based Subject-II	ECO ENGLISH	4	4	25	75	100	30	40
	IV	24	Non Major Elective-II	BUSINESS COMMUNICATION	2	2	25	75	100	30	40
	V	-	Extension Activity	NCC, NSS, YRC, YWF		1					
SUBTOTAL					30	23					

British Poetry

Objectives:

1. To provide a historical perspective of British poetry.
2. Interpretation and appreciation of the selected texts from the genre of poetry.

Unit-I : Edmund Spenser : Epithalamion
John Milton : Lycidas

Unit-II : William Wordsworth : Lines Composed a Few Miles above
Tintern Abbey (July 13, 1798)
P. B. Shelley : Ode to Skylark
John Keats : Ode to a Nightingale
William Blake : The Tyger

Unit-III : Tennyson : Ulysses
Browning : My Last Duchess
Matthew Arnold : The Scholar Gipsy

Unit-IV : Hopkins : The Windhover
T. S. Eliot : The Hollow Men
W. B. Yeats : A Prayer for my Daughter
W. H. Auden : The Unknown Citizen

Unit-V : Wilfred Owen : Strange Meeting,
Philip Larkin : Church Going
Ted Hughes : Work and Play
Carol Ann Duffy : Valentine

PAGEMAKER AND PHOTOSHOP

Unit I: Introduction to DTP-Exploring common features in Page Maker, Working with files and folders, Saving, Moving and Copying, Renaming, Deleting-Editing in PageMaker: PageMaker window, creating-closing publications, Editing text- Formatting text.

Unit II: Master pages- placing elements on Master page- placing guidelines, placing header and page number, creating Master page- removing master page- editing master page- creating columns.

Unit III: Working with graphics and objects: Tool Bar, Placing graphic on the page, importing graphic, resizing a graphic, moving a graphics, cropping a graphic, grouping and ungrouping-managing and printing-page –orientation-numbering-page size-dimensions-margins-table of content-managing books.

Unit IV: Starting with Photoshop-program window, working with images-rotating, cropping, revealing the hidden images, freehand; making selection-selection tool, lasso tool, copying, filling, transforming-painting tools-drawing tools-retouching tools.

Unit V: Creating layers-filters-printing and customization- import, export, printing.

Text & Reference Books:

1. Vikas Gupta, COMDEX DTP course kit, Dream Tech press, 2006 edition.
2. Adobe Pearson, ADOBE PHOTOSHOP CC CALSSROOM IN A BOOK, 2015
3. Lisa Danae D Wiley, ADOBE PHOTOSHOP CC BIBLE, 2014
4. Scott Kelby Pearson, THE ADOBE PHOTOSHOP LIGHTROOM 5 BOOK, 2014
5. Proot Cengage, ADOBE PAGEMAKER 7.0, 2009
6. PAGEMAKER 7.0 TRAINING GUIDE BY JAIN BPB 2014

**MSU/2016-17/UG-Colleges/Part-III (B.A. English with Computer Applications) /
Semester-III / Practical**

PAGEMAKER AND PHOTOSHOP – PRACTICALS

PAGEMAKER

1. Design of ID card (3"x2")/ visiting card(3.5"x2")
2. Design of an attractive invitation card (5.5"x4.5") / letter pad (7.5"x9")
3. Preparation of a small booklet with six pages (3.5"x4.5")
4. Design of a handbill (5.5"x8.5") / Advertisement
5. Design of a college progress card / a Receipt bill with counter foil.

PHOTOSHOP

1. Design of a brochure for an institution
2. Seasonal Greeting card
3. Transporting an image from one background to another
4. Design a webpage poster (1004x750) / Text book cover page
5. Crop an image / rotate an image.

Phonetics and Spoken English

Objectives:

1. To impart proficiency in pronunciation and oral communication.
2. To use appropriate language skills for various communicative functions in different socio-cultural contexts.

Unit - I

Organs of Speech & Vowels,

Unit - II

Consonants, Stress, & Intonation

Unit – III

Transcription of words, sentences and marking of stress

Unit – IV

At a Bank I – At a Bank, II – At a hotel reception Hall, Helping a friend to obtain a flat I, II and III – A discussion between two friends Booking Accommodation at an outstation hotel, Enquiring about flight/Arrivals. Enquiry for information. At the Restaurant, Visiting a Doctor, At the library

Unit - V

Greeting, Introduction, Information, Invitation, Permission, Request, Offers, Compliments, Sympathy, Apology Complaint, Gratitude, Persuasion, Suggestion, Warning, Opinion, Turn taking, Interview, Group Discussion, Public Speaking

Texts Prescribed:

1. P. Iyyadurai. *English Phonetics for Beginners*. Jones Publication
2. Jayashree Balan. *Spoken English* (Vijaya Publication)
3. Saraswathy and Noorjahan. *Spoken English*

**MSU/2016-17/UG-Colleges/Part-IV (B.A. English with Computer Applications)
Semester-III/ Ppr.no.18/Non-Major Elective -I**

English for Employability

Objectives:

1. To enhance the language skill of the students..
2. To enhance the employability skills of the students.

Unit-I

1. The Verbs
2. Sentence Structure

Unit-II

3. Concord
4. Spotting Errors

Unit-III

5. Letter Writing – Formal
6. Curriculum Vitae

Unit-IV

7. Report Writing
8. Job Interview

Unit-V

9. Functional Communication
10. Group Discussion

Texts Prescribed:

T.M. Farhathullah & D.S.Kesava Rao: *Strengthen Your English for competitive Examinations*. Emerald Publishers, Chennai

British Drama

Objectives:

1. To acquaint the students to the growth and development of English drama from a historical perspective.
2. To accustom the students to the various dramatic devices and techniques used in the genre.

Unit-I

Christopher Marlowe : *Dr. Faustus*

Unit-II

Oliver Goldsmith : *She Stoops to Conquer*

Unit-III

Richard Brinsley Sheridan : *School for Scandal*

Unit-IV

John Galsworthy : *Strife*

Unit-V

Bernard Shaw : *Candida*

CORAL DRAW

Unit I: Introduction: Introduction to CorelDraw: Customize the workspace, Difference between raster and Vector graph. Creating Graphical object: Set up a drawing page, draw various shapes and lines include objects and add text to the objects, object selection techniques.

Unit II: Objects Formation And Manipulation Of Text: Formatting Objects: Working with files, creating objects, modifying objects, outlines and align objects and Object tools. Manipulation of Text: Fit text on path, work with paragraph text, wrapping paragraph text, work with text, insert special character, spell check documents. Working with Tables: Create and modify tables, Formation of tables.

Unit III: Enhancements Of Drawing And Design: Enhancing a Drawing: Apply Artistic Media tool effects to various objects, creating symbols. Working with page: Understanding page elements, create Layers. Color: Creating and setting guidelines color. Create Design: Create Shapes, custom Shapes.

Unit IV: Manipulation Of Drawing And Images: Manipulating a Drawing: Format object and Edit objects. Working with images: Enhance image, Conversion of Bit map image to vector image, Zooming and viewing images.

Unit V: Essential Elements Of Interface: Developing interface Elements and Task: Hyper link text, working with file convertor Macro, print merge documents, prepare for distribution: Finalizing a documents, Output a documents. Lock and Un Lock object.

Text & Reference Books:

1. Kogent Solutions Inc. Coreldraw X4 and X7 in Simple Steps Paperback – 2008
2. Dinesh Maidasani , Coreldraw X3 (Straight to the Point) 2007
3. Gary David Bouton, CorelDRAW X7 Paperback – 2015
4. Bangia R, Learning Coreldraw X5 PB Paperback – 2011
5. Kogent Solutions Inc., Coreldraw X4 in Simple Steps Paperback – 2008

**MSU/2016-17/UG-Colleges/Part-III (B.A. English with Computer Applications) /
Semester-IV/ Practicals**

COREL DRAW AND ITS APPLICATION PRACTICALS

1. Develop CorelDraw application to draw a pie or arc shape.
2. Develop CorelDraw application to creating a seasonal greetings card.
3. Develop CorelDraw application to Preparing documents for printing
4. Develop CorelDraw application to open and Create a student data sheet.
5. Develop CorelDraw application to Edit Text and Basic Shapes.
6. Develop CorelDraw application Add Text to object.
7. Develop CorelDraw application to draw straight line.
8. Develop CorelDraw application to Create and Use Perfect Shapes .
9. Develop CorelDraw application to draw a polygon shapes.
10. Develop CorelDraw application of Working with text style in your documents
11. Develop CorelDraw application to Applying Spell check to your documents
12. Develop CorelDraw application Working with paragraph text

Eco English

Objectives: The course will enable the students:

- To improve their communicative competence in English, both speaking and writing.
- To augment their ability to read fast with better understanding.
- To express themselves clearly and concisely using right words in right places.

Unit I:

1. A Mini-story
2. Will the world come to an End?

Unit II:

3. Noah Today
4. Mass Extinction

Unit III:

5. A Poem about Climate Change
6. No one is Happy!

Unit IV:

7. “The Happy Man’s Shirt” – Italian Folktale – Retold
8. Polluting the World

Unit V:

9. Can Earth be Earth?
10. Animal Farm

Text:

Eco English: Learning English through Environmental Issues: An Integrated, Interactive Anthology. N. Krishnaswamy, Lalitha Krishnaswamy and Dr. B. S. Valke. Bloomsbury Pub. India. Pvt. Ltd. New Delhi.

**MSU/2016-17/UG-Colleges/Part-IV (B.A. English with Computer Applications) /
Semester-IV/ Ppr.no.24 / Non-Major Elective-II**

Business Communication

Objectives:

1. To impart the young graduates the basic concepts and practices of business communication and their application in the business world today.

Unit-I

1. Language and Communication
2. Communication in Organisation

Unit-II

3. Audio-Visual Aids
4. e-mail drafting

Unit-III

5. Formal Report
6. Technical Proposals

Unit-IV

7. Business Correspondence
8. Notice, Agenda, Minutes & Manual

Unit-V

9. Advertising
10. Graphic Aids

Prescribed Text: Krishna Mohan & Meera Benerjee: *Developing Communication Skills*,
Macmillian

MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI
 UG COURSES – AFFILIATED COLLEGES

B.A. English

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(45th SCAA meeting held on 09.02.2017)

Sem.	Part I/II/ III/IV	Sub. No	Subject Status	SUBJECT TITLE	Hrs./ Week	Cre- dits	Marks				
							Maximum			Passing Minimum	
							Int.	Ext.	Tot	Ext.	Tot.
III	I	13	Language	TAMIL/OTHER LANGUAGE	6	3	25	75	100	30	40
	II	14	Language	ENGLISH	6	3	25	7	100	30	40
	III	15	Core- 5	BRITISH POETRY	6	5	25	5	100	30	40
	III	16	Allied - III	HISTORY OF ENGLISH LITERATURE-I	6	5	25	75	100	30	40
	IV	17	Skilled Based Subject -I	PHONETICS AND SPOKEN ENGLISH	4	4	25	75	100	30	40
	IV	18	Non- Major Elective -I	ENGLISH FOR EMPLOYABILITY	2	2	25	75	100	30	40
	SUB TOTAL					30	22				
IV	I	19	Language	TAMIL/OTHER LANGUAGE	6	3	25	75	100	30	40
	II	20	Language	ENGLISH	6	3	25	7	100	30	40
	III	21	Core- 6	BRITISH DRAMA	6	5	25	5	100	30	40
	III	22	Allied - IV	HISTORY OF ENGLISH LITERATURE-II	6	5	25	75	100	30	40
	IV	23	Skilled-Based Subject-II	ECO ENGLISH	4	4	25	75	100	30	40
	IV	24	Non Major Elective-II	BUSINESS COMMUNICATION	2	2	25	75	100	30	40
	V	-	Extension Activity	NCC, NSS, YRC, YWF		1					
SUBTOTAL					30	23					

British Poetry

Objectives:

1. To provide a historical perspective of British poetry.
2. Interpretation and appreciation of the selected texts from the genre of poetry.

Unit-I : Edmund Spencer : Epithalamion
John Milton : Lycidas

Unit-II : William Wordsworth : Lines Composed a Few Miles above
Tintern Abbey (July 13, 1798)
P. B. Shelley : Ode to Skylark
John Keats : Ode to a Nightingale
William Blake : The Tyger

Unit-III : Tennyson : Ulysses
Browning : My Last Duchess
Matthew Arnold : The Scholar Gipsy

Unit-IV : Hopkins : The Windhover
T. S. Eliot : The Hollow Men
W. B. Yeats : A Prayer for my Daughter
W. H. Auden : The Unknown Citizen

Unit-V : Wilfred Owen : Strange Meeting,
Philip Larkin : Church Going
Ted Hughes : Work and Play
Carol Ann Duffy : Valentine

History of English Literature – I

Objectives:

1. To give a clear and systemic understanding of the national changes and developments that influenced British Literature.
2. To familiarize the students about the historical movements that influenced the transformation of the literary tastes and standards.

Unit-I

The Age of Chaucer (1340-1044)
From Chaucer to 'Tottel's Miscellany' (1400-1557)

Unit-II

The Development of the Drama to 1561
The Age of Shakespeare – Non-Dramatic Verse, the Drama & the Prose

Unit-III

The Age of Milton – Milton, other Poets & Prose Writers

Unit-IV

The Age of Dryden – Verse, Prose & the Drama

Unit-V

The Age of Pope – Verse, Prose & the Drama

Text Prescribed:

William Henry Hudson: *An Outline History of English Literature*. Mahaam Publishers,
Chennai – 78. mahampublishers@gmail.com.

References:

Aditi Chowdhury and Rita Gowswamy. *A History of English Literature: Traversing the Centuries*. Orient Blackswan Pvt. Ltd.

Phonetics and Spoken English

Objectives:

1. To impart proficiency in pronunciation and oral communication.
2. To use appropriate language skills for various communicative functions in different socio-cultural contexts.

Unit - I

Organs of Speech & Vowels,

Unit - II

Consonants, Stress, & Intonation

Unit – III

Transcription of words, sentences and marking of stress

Unit – IV

At a Bank I – At a Bank, II – At a hotel reception Hall, Helping a friend to obtain a flat I, II and III – A discussion between two friends Booking Accommodation at an outstation hotel, Enquiring about flight/Arrivals. Enquiry for information. At the Restaurant, Visiting a Doctor, At the library

Unit - V

Greeting, Introduction, Information, Invitation, Permission, Request, Offers, Compliments, Sympathy, Apology Complaint, Gratitude, Persuasion, Suggestion, Warning, Opinion, Turn taking, Interview, Group Discussion, Public Speaking

Texts Prescribed:

1. P. Iyyadurai. *English Phonetics for Beginners*. Jones Publication
2. Jayashree Balan. *Spoken English* (Vijaya Publication)
3. Saraswathy and Noorjahan. *Spoken English*

English for Employability

Objectives:

1. To enhance the language skill of the students..
2. To enhance the employability skills of the students.

Unit-I

1. The Verbs
2. Sentence Structure

Unit-II

3. Concord
4. Spotting Errors

Unit-III

5. Letter Writing – Formal
6. Curriculum Vitae

Unit-IV

7. Report Writing
8. Job Interview

Unit-V

9. Functional Communication
10. Group Discussion

Texts Prescribed:

T.M. Farhathullah & D.S.Kesava Rao: *Strengthen Your English for competitive Examinations*. Emerald Publishers, Chennai

British Drama

Objectives:

1. To acquaint the students to the growth and development of English drama from a historical perspective.
2. To accustom the students to the various dramatic devices and techniques used in the genre.

Unit-I

Christopher Marlowe : *Dr. Faustus*

Unit-II

Oliver Goldsmith : *She Stoops to Conquer*

Unit-III

Richard Brinsley Sheridan : *School for Scandal*

Unit-IV

John Galsworthy : *Strife*

Unit-V

Bernard Shaw : *Candida*

History of English Literature - II

Objectives:

1. To give a clear and systemic understanding of the national changes and developments that influenced British Literature.
2. To familiarize the students about the historical movements that influenced the transformation of the literary tastes and standards.

Unit-I

The Age of Johnson – General Prose, the Novel & the Verse

Unit-II

The Age of Wordsworth– The Older Poets & the Younger Poets

Unit-III

The Age of Tennyson – Verse, General Prose & the Novel

Unit-IV

The Age of Hardy

Unit-V

The Present Age

Texts Prescribed:

William Henry Hudson: *An Outline History of English Literature*. Mahaam Publishers,
Chennai – 78. mahampublishers@gmail.com.

Eco English

Objectives: The course will enable the students:

- To improve their communicative competence in English both speaking and writing.
- To augment their ability to read fast with better understanding.
- To express themselves clearly and concisely using right words in right places.

Unit I:

1. A Mini-story
2. Will the world come to an End?

Unit II:

3. Noah Today
4. Mass Extinction

Unit III:

5. A Poem about Climate Change
6. No one is Happy!

Unit IV:

7. “The Happy Man’s Shirt” – Italian Folktale – Retold
8. Polluting the World

Unit V:

9. Can Earth be Earth?
10. Animal Farm

Prescribed Text:

Eco English: Learning English through Environmental Issues: An Integrated, Interactive Anthology. N. Krishnaswamy, Lalitha Krishnaswamy and Dr. B. S. Valke. Bloomsbury Pub. India. Pvt. Ltd. New Delhi.

Business Communication

Objectives:

- To impart the young graduates the basic concepts and practices of business communication and their application in the business world today.

Unit-I

1. Language and Communication
2. Communication in Organisation

Unit-II

3. Audio-Visual Aids
4. e-mail drafting

Unit-III

5. Formal Report
6. Technical Proposals

Unit-IV

7. Business Correspondence
8. Notice, Agenda, Minutes & Manual

Unit-V

9. Advertising
10. Graphic Aids

Prescribed Text: Krishna Mohan & Meera Benerjee: *Developing Communication Skills*,
Macmillian

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

B.A History (Vocational) Tourism

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(45th SCAA meeting held on 09.02.2017)

Sem.	Pt. I/II/I II/I V	Sub. No.	Subject status	Subject Title	Hrs./ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	I	13	Language	TAMIL/OTHER LANGUAGE	6	3	25	75	100	30	40
	II	14	Language	ENGLISH	6	3	25	75	100	30	40
	III	15	Core - 5	ART AND ARCHITECTURE IN INDIA (SOUTH INDIA)	6	5	25	75	100	30	40
	III	16	Allied -III	A) TOURISM MARKETING B) TRAVEL GEOGRAPHY C) CONCEPT AND IMPACTS OF TOURISM	6	5	25	75	100	30	40
	IV	17	Skilled Based subject -I	PRINCIPLES OF MANAGEMENT	4	4	25	75	100	30	40
	IV	18	Non-Major Elective -I	OFFICE ADMINISTRATION	2	2	25	75	100	30	40
Subtotal					30	22					

Sem.	Pt. I/II/I II/I V	Sub. No.	Subject status	Subject Title	Hrs./ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	I	19	Language	TAMIL/OTHER LANGUAGE	6	3	25	75	100	30	40
	II	20	Language	ENGLISH	6	3	25	75	100	30	40
	III	21	Core - 6	ART AND ARCHITECTURE IN INDIA (NORTH INDIA)	6	5	25	75	100	30	40
	III	22	Allied -IV	(A) PROFILE OF MODERN TOURISM TRAVEL GEOGRAPHY (B) MANAGERIAL ACCOUNTING AND FINANCE IN TOURISM (C) ORGANIZATIONAL BEHAVIOUR	6	5	25	75	100	30	40
	IV	23	Skilled Based subject -II	BUSINESS COMMUNICATIONS SKILLS	4	4	25	75	100	30	40
	IV	24	Non-Major Elective -II	(A) HOUSE KEEPING OPERATIONS (B) TRAVEL AGENCY & TOUR OPERATIONS	2	2	25	75	100	30	40
	V	-	Extension Activity	NCC,NSS, YRC, YWF		1					
Subtotal					30	23					

ART AND ARCHITECTURE IN INDIA (SOUTH INDIA)

Unit – I:

Excavations - Arikamedu And Adichanailur - Artifacts - Seals And Pottery - Metal Art And Coins.

Unit –II:

Andhra - Amaravathi- Nagarjuna Konda, Chalukya - Durga & Ladkhan Temple At Aihole, Cave Temple At Badami, Virupaksha At Pattadakal, Rashtrakuta - Ellora Temples- Hoysalas Chennakesava Temples.

Unit III:

Pallavas- Mahabalipuram- Kailasanatha Temple- Pandyas Cave Temple ,Cholas Brahadeshwara, Gangaikonda Cholapuram, Dharasuram Temple- Vijayanagar - Virupaksha & Vitalaswami Temple, Hampi

Unit IV:

Sculptures- Mahabalipuram- Ellora, Belur & Halabid- Bronzes of South India.

Unit V:

Paintings- Kanchipuram, Sittanavasal, Thaniavur- Lepakshi. Music - Carnatic- Dances- Bharathanatyam, Kuchipudia, Mohiniattam, Kathak- Bagavathamela.

Books for Reference:

1. Percy Brown : Indian Architecture Buddhist and Hindu Architecture - Volume I and II
2. K.A. Mahalingam : A History South India.
3. T.V. Mahalingam : Early Pandya Architecture
4. C.V. Narayana Iyer : Origin and History of Saivism

MSU/2016-17/UG-Colleges/Part-III /B.A. History(vocational) Tourism/Semester-III/ Ppr.no.16 (A)

Allied-III – (A)

Tourism Marketing

Unit I

Core concepts in Marketing, Needs, Wants & Demands, Products, Customer value & satisfaction, quality, exchange & transactions, markets and marketing.

Unit II

Segmentation of Tourism Market-concept, justification, importance and bases. Market Research-methods, research problem areas, marketing research in the tourism industry. Tourism life cycle.

Unit III Tourism Marketing Mix-8 Ps. Methods of Pricing-the factors influencing the pricing decisions, pricing objectives, pricing policies. Service Characteristics of Tourism. Unique features of tourist demand and tourism product. Branding and packaging-conditions that support branding.

Unit IV

Destination Planning and Product Diversification. Destination Marketing. Marketing strategy in the new digital age-E-Business, E-Commerce and E-Marketing. Complementary Marketing.

Unit V

Role of Media in promotion of Tourism TV/ Radio, Newspaper, Travel Magazines, Documentaries, Guide Books, Travel writers, Electronic

Tourism promotion: Advertising, Public relations, sales promotion and personal selling.

Suggested Readings:

- Kotler Philip, Marketing Management: Analysis, Planning Implementation, and Control, Prentice Hall of India, New Delhi.
- Brigs, Susan- Successful Tourism Marketing: A Practical Handbook, Kogan Page, London, 1997.
- Middleton- Victor T.C Marketing in Travel and Tourism, Oxford, 1994
- Brunt, Paul- Market Research in Travel and Tourism, Butterworth Heinemann, 1997.
- Hollway, J.C. Marketing for Tourism (Harlow: Longman, 1995)
- Nama Kumari and Rama Swami- Marketing Management

**MSU/2016-17/UG-Colleges/Part-III /B.A. History(vocational)Tourism/Semester-III/ Ppr.no.16(B)
Allied-III (B)**

TRAVEL GEOGRAPHY

Unit – I:

Geographical features, location, physiography, metrology etc. – topography and geology-natural vegetation – population and human development – drainage.

Unit- II :

Geography of tourism: Overview- world's continents – longitude and Gratitude of map reading skills – Exploring the countries of the world and cities.

Unit- III:

Natural tourist resources – land forms & terrains – tourist destinations – water bodies – hill af mountain resorts – sanctuaries – monuments, historical and archaeological sites, museum and art galleries etc.

Unit – IV:

Development of Tourism in India with special reference to geography – Impact Assessment – approaches, methodology and techniques

Unit – V:

World time zones – Elapsed travel times – international date line

Books for Reference:

1. Bhatia A.K. - Tourism Development, Principles and Practices
2. Dubey & Negi - Economic Geographic
3. Jagmohan Negi - Tourism Guide and Tour Operation : Planning and Organizing

**MSU/2016-17/UG-Colleges/Part-III /B.A. History(vocational)Tourism/Semester-III/ Ppr.no.16 (C)
Allied-III (C)**

Concept and Impacts of Tourism

Unit I 25

Definition and Concept of Tourism. Leisure and Recreation, Excursionist, Business Tourism, VFR, Mass Tourism, Adventure Tourism, Sports Tourism, Rural Tourism. Tourism education. Typology of Tourism. Tourism Statistics. Difference between visitors, tourists and excursionist. Tourism as an industry.

Unit II 20

Tourism Impacts- Political, Social, Cultural, Environmental and Economic. Tourism multiplier. National and international concerns and problems.

Unit III 20

Demand- Supply Characteristics-Concepts, definitions and indicators of demand. Measuring demand for tourism-International and Domestic Tourism. Technological progress and Globalization. Concept and resources for Ecotourism. Motivation for tourism.

Suggested Readings

1. Burkart, A.J & Heinemann Medlik, Tourism: Past. Present and Future, Professional Publishing, London, 1986 reprint
2. Mill, Robert, The Tourism System: An Introductory Text, Hall International, London, 1992.
3. Kamra, Krishan, Basics of Tourism: Theory, Operation, Kanishka Publishers, New Delhi, 2002.
4. Bhatia, A.K. International Tourism Marketing ,Sterling, New Delhi, 2008
5. Dr. S. K. Kabia-Tourism and Environment
6. Wahab, S.E. Tourism Management, Tourism International Press, London, 1986.
7. Dr. Jasbir Singh, Eco-Tourism, I.K. International Publishing, New Delhi , 2010

PRINCIPLES OF MANAGEMENT

UNIT -I:

HISTORICAL DEVELOPMENT

Definition of Management - Science or Art - Management and Administration - Development of Management Thought - Contribution of Taylor and Fayol - Functions of Management - Types of Business Organisation.

UNIT -II:

PLANNING Nature & Purpose - Steps involved in Planning - Objectives - Setting Objectives - Process of Managing by Objectives - Strategies, Policies & Planning Premises- Forecasting - Decision-making.

UNIT -III:

ORGANISING Nature and Purpose - Formal and informal organization - Organization Chart - Structure and Process - Departmentation by difference strategies - Line and Staff authority - Benefits and Limitations - De-Centralization and Delegation of Authority - Staffing - Selection Process - Techniques - HRD - Managerial Effectiveness.

UNIT -IV

DIRECTING Scope - Human Factors - Creativity and Innovation - Harmonizing Objectives - Leadership - Types of Leadership Motivation - Hierarchy of needs - Motivation theories - Motivational Techniques - Job Enrichment - Communication - Process of Communication - Barriers and Breakdown - Effective Communication - Electronic media in Communication.

UNIT -V:

CONTROLLING System and process of Controlling - Requirements for effective control - The Budget as Control Technique - Information Technology in Controlling - Use of computers in handling the information - Productivity - Problems and Management - Control of Overall Performance - Direct and Preventive Control - Reporting - The Global Environment - Globalization and Liberalization - International Management and Global theory of Management.

Books for Reference:

1. Harold Kooritz & Heinz Weihrich "Essentials of Management", Tata McGraw-Hill,1998
2. Joseph L Massie "Essentials of Management", Prentice Hall of India, (Pearson) Fourth Edition, 2003.
3. Tripathy PC And Reddy PN, " Principles of Management", Tata McGraw-Hill, 1999.
4. Decenzo David, Robbin Stephen A, "Personnel and Human Reasons Management", Prentice Hall of India, 1996
5. JAF Stomer, Freeman R. E and Daniel R Gilbert Management, Pearson Education, Sixth Edition, 2004.
6. Fraidoon Mazda, "Engineering Management", Addison Wesley,-2000.

OFFICE ADMINISTRATION

Unit-I:

Meaning of office – Importance of an office – Functions of an office – meaning of office administration – office manager – functions.

Unit-II:

Office layout – objectives – importance – principles of office layout – open office – private office. Office furniture – need for standardized furniture – selection of furniture – types of furniture.

Unit-III:

Filing – Functions – significance – Advantages. methods of classification of files – filing system and equipments. Indexing.

Unit-IV:

Office forms – kinds – Forms control – Objectives of forms control – forms designing – principles of form designing continuous stationary supplies.

Unit-V:

Office mechanization – objects – need for office machanisation – office automation – selection of office machines – types of machines.

Books for Reference:

1. Office organization and Management - R.K.Chopra
2. Office Management and commercial correspondence – Balraj Digga

ART AND ARCHITECTURE IN INDIA (NORTH INDIA)

Unit-I:

Indus Valley Civilization - seals - pottery. Architecture- sculpture - painting - minor art.

Unit – II:

Mauryan Architecture - Asoka's contribution - foreign influence Mauryan sculpture - Bull and Lion capitals - Buddhist Architecture - Sarnath pillar – Sanchi stupa, Chaitya at Kane - Viharas at Nasik and Ajanta

Unit – III:

Evolution of Temple Architecture - Gupta period - Sanchi - Deogarh.

Unit – IV:

Indo Islamic Architecture - Qutb Minar- Fatehpur sikri - Taj mahal - Redfort

Unit – V:

Painting - Ajantha - Miniature paintings of Mughals, Rajasthani, Pahari, Music - Hindustani, Carnatic - Dances - Kathakali Odessa, Manipuri, Kathak, Bharatnatyam, Mohini attam and Kuchipudi , Folklore dances .

Books for reference:

1. Percy brown – Indian Architecture [Hindu and Buddhists] Volume I &II
2. Basham A .L -The wonder that was India

MSU/2016-17/UG-Colleges/Part-III / B.A. History(vocational)Tourism / Semester-IV/ Ppr.no.22 (A)

Allied -IV(A)

Profile of Modern Tourism

Unit-I

Tourism Policy and Services- Domestic Tourism, International Tourism, Transport Policy, Cultural and Heritage Policy, Commercial policy. Health and Medical Tourism.

Unit - II

Emerging trends and new thrust area of Tourism. Five year plans and tourism. Future prospects of Tourism in India.

Unit III

Seasonality-Indian Tourism Season, Tourism and Terrorism, Tourism and communalism.fairs and festivals. Counter seasonal policy. Special interest tourism and its resources.Wild life sanctuaries and national parks, Wildlife tourism.

Unit IV

Motivation and Nature of consumption. Tourism Products and services, Salient features of Tourism Product. Public sector and Private Sector partnership in tourism sector.Small and medium enterprises in tourism industry.

Unit V

Principle of resort development.Mass Tourism and New Destinations.

Suggested readings:

1. Abraham, Pizen and YoelMansfiel, Ed. Consumer Behaviour in Travel and Tourism
2. Butterworth and HeinemanBurkhardt and Medlik -Tourism Past Present and Future.
3. Jones and Radcllfe” Leisure and Tourism- Longman Harlem
4. K. Ghimire” The Native Tourist”- Earthscan, London,
5. Pearce and Butler Ed. “ Contemporary Issues in Tourism Development- Routledge, London,
6. Robinson- “ The Geography of Tourism”

Managerial Accounting & Finance in Tourism

Unit I:

Nature of accounting: Nature of accounting and Generally accepted accounting principles.
Double entry, Book Keeping – Transaction Analysis, Cash Book and Bank
Transactions. Income Measurements. Preparation of Trial Balance.

Unit II:

Final Accounts: Balance Sheet. Rectification of Errors, Bank Reconciliation Statement
Accounting for Non- Trading Concerns. Miscellaneous Accounts : Accounting for Hotels,
Depreciation Accounting, Travel Accounting, Mechanised system of accounting. Cash flow
statement

Unit III:

Meaning, Role, Scope and Importance of Financial Management: Job of the financial
Manager, financial Goals, financial control, Organization & objective of financial function.
Financial Planning, Capitalisation and Capital Structure: Meaning, concept of capital, Theories
of capitalization, Over capitalization and under capitalization,

Unit IV

Optimum capital structure, Determinant of capital structure, Financial Leverage, Debt
capacity of company Debt equity ratio. Capital Budgeting and Capital Investment Decision:
Management of Fixed Assets, Meaning, roles and analysis of capital investment in fixed
Assets.

Unit V Working Capital Management: Concept, need, determinant of working capital, estimates of
working capital and financing of current assets. Financial Statements and Analysis: Meaning, Analysis –
Ratio, Fund flow, Cash flow, Cost volume Analysis. Tourism Finance Corporation
of India TFCI: Aims, Objectives and Functions.

Suggested readings

1. Anthony and Reece, Management Accounting Principles : Text and Cases
2. Singh, Surender and Kaur, Rajeev. *Fundamentals of Financial Management*. Book
Bank International.
3. Pandey, L.M., Management Accounting : A Planning and Control Approach, Vikas
Publication.
4. Davis D., The Art of Managing Finance, McGraw Hill.
5. Pandey, I.M., Financial Management, Vikas Publication
6. Van Horne, Financial Management and Policy, Prentice Hall.
7. Panday, I.M., and Bhatt, Ramesh, Cases in Financial Management, TATA Magraw Hill.

ORGANIZATIONAL BEHAVIOUR

Unit – I:

Importance and scope of organizational psychology – Individual difference – intelligence tests – Measurement of intelligence – personality tests – nature, types and uses.

Unit – II:

Perception – Factors affecting perception – Motivation – theories – financial and non-financial motivation – techniques of motivation – transactional Analysis – Brain storming.

Unit – III:

Job satisfaction – meaning- factors- theories – management of job satisfaction- morale – importance – Employee attitude and behavior and their significance to employee productivity – job enrichment – enlargement

Unit – IV:

Group Dynamics – Cohesiveness – Co-operation – competition – conflict – types of conflict – resolution of conflict – socio metry – group norms – role – position – status – supervision style – training for supervisions.

Unit – V:

Leadership – types – theories – leadership and evaluation – organizational climate – organizational effectiveness – organizational development – counseling and guidance – Importance of counselor – types of counseling – information needed for counseling.

Books for Reference:

1. Keith Davis - Human Behaviour at work
2. Ghos - Industrial Psychology
3. Fred Luthans - Organizational Behaviour
4. L.M Prasad - Organizational Behaviour
5. Hippo - organizational Behaviour

Skill Based - II

Business Communication Skills

Unit I

Nature of Communication Process of Communication, Types of Communication (verbal & Non Verbal), Importance of Communication, Different forms of Communication, Barriers to Communication Causes, Linguistic Barriers, Psychological Barriers, Interpersonal Barriers, Cultural Barriers, Physical Barriers, Organizational Barriers

Unit II a

Business Correspondence: Letter Writing, presentation, Inviting quotations, Sending quotations, Placing orders, Inviting tenders, Sales letters, claim & adjustment letters and social correspondence, Memorandum, Inter-office Memo, Notices, Agenda, Minutes, Job application letter, preparing the Resume.

Unit III

Report Writing Business reports, Types, Characteristics, Importance, Elements of structure, Process of writing, Order of writing, the final draft, check lists for reports.

Unit IV

Vocabulary Words often confused, Words often misspelt, Common errors in English.

Unit V Oral Presentation, Importance, Characteristics, Presentation Plan, Power point presentation, Visual aids.

Suggested Readings:

1. Lesikar, R.V. & Flatley, M.E.; *Basic Business Communication Skills for Empowering the Internet Generation*, Tata McGraw Hill Publishing Company Ltd. New Delhi.
2. Bovee, and Thill, *Business Communication Today*, Pearson Education
3. Shirley Taylor, *Communication for Business*, Pearson Education
4. Locker and Kaczmarek, *Business Communication: Building Critical Skills*, TMH
5. Sinha, K.K., *Business Communication*, Galgotia and Sons, New Delhi.

Non Major Elective -II (A)

HOUSE KEEPING OPERATIONS

Unit –I: Introduction to housekeeping department - role of housekeeping in hospitality industry - classification of hotel - classification of rooms - layout of housekeeping department.

UNIT – II:

Organization of a housekeeping department - job description of housekeeping personnel - department that housekeeping coordinates with qualities of housekeeping staff.

UNIT – III:

Classification of cleaning equipment - manual mechanical – selection criteria of equipment - cleaning agent - selection criteria of cleaning agent.

UNIT – IV:

Classification of cleaning agent (alkalis, acids, solvents, abrasives - deodorizing, disinfectant, distribution and control) - maids service room.

UNIT – V:

Layout and essential features - organizing maid`s trolley.

Books for Reference:

1. Hotel Housekeeping, Sudhir Andrews, Tata McGraw Hill
2. The Professional Housekeeper, Trucker Scheneider, VNR
3. Housekeeping Management for Hotels, Rosemary Hurst, Heinemann
4. Accommodation & Cleaning Services, Vol. I & II, Davide Allen, Hutchinson

Non Major Elective-II (B)

TRAVEL AGENCY & TOUR OPERATIONS

Unit-I:

Travel agency, definitions and its scope – Definition of a tour operator and their functions – History of Travel agency and present status of travel agency system in India & abroad.

Unit-II:

Procedure for approval of a travel agency and tour operator to sell tourism pertaining to Travel agency and tour operator. Organisation & structure of a travel agency and tour operation.

Unit-III:

Ticketing, Itinerary preparation & Marketing of tourism products or packages by travel agency & tour operator. Linkages & arrangements of a travel agency , tour operator with hotels, airlines and other transport agencies.

Unit-IV:

The need for professionalization & the job training for a travel agency & tour operator.

Unit – V:

Management of private & public airlines in India, Case studies of Sahara, Jet etc.

Books for reference:

1. A.K Bhatia - Tourism development , principles & practices
2. VTC Middleton - Marketing in travel & tourism , Hein man publications
3. JMS & Nagi - Tourism & Hoteliering , Gethanjali publications
4. Michael Hall C - Tourism planning, Policies, Processes & Relationships, Pearson Education Ltd.
5. Javid Akhbar - Tourism Management in India , Ashish, New Delhi 1990.

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

B.A History

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem.	Pt. I/II/ III/ IV	Sub. No.	Subject status	Subject Title	Hrs./ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	I	13	Language	TAMIL/OTHER LANGUAGE	6	3	25	75	100	30	40
	II	14	Language	ENGLISH	6	3	25	75	100	30	40
	III	15	Core - 5	HISTORY OF INDIA (1526 A.D. - 1772 A.D)	6	5	25	75	100	30	40
	III	16	Allied -III	MODERN POLITICAL THOUGHT/ ECONOMICS/ SOCIOLOGY	6	5	25	75	100	30	40
	IV	17	Skilled Based subject -I	(A) HISTORY OF PATHFINDERS OF TAMILNADU (1680-1975 A.D) (B) PANCHAYAT RAJ IN INDIA WITH A REFERENCE TO TAMIL NADU	4	4	25	75	100	30	40
	IV	18	Non-Major Elective -I	(A) FREEDOM MOVEMENT IN INDIA (B) GANDHIAN THOUGHT (TRUTH AND NON- VIOLENCE)	2	2	25	75	100	30	40
Subtotal					30	22					

Sem.	Pt. I/II/ III/ IV	Sub. No.	Subject status	Subject Title	Hrs./ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	I	19	Language	TAMIL/OTHER LANGUAGE	6	3	25	75	100	30	40
	II	20	Language	ENGLISH	6	3	25	75	100	30	40
	III	21	Core - 6	HISTORY OF INDIA FROM 1772- 1947 AD	6	5	25	75	100	30	40
	III	22	Allied -IV	INDIAN ADMINISTRATIVE SYSTEM / ECONOMICS/ SOCIOLOGY	6	5	25	75	100	30	40
	IV	23	Skilled Based subject -II	(A) PRINCIPLES AND METHODS OF ARCHAEOLOGY (B) EPIGRAPHY	4	4	25	75	100	30	40
	IV	24	Non-Major Elective -II	(A) SOCIAL REFORMERS OF MODERN INDIA (B) INDIAN CONSTITUTION	2	2	25	75	100	30	40
	V	-	Extension Activity	NCC,NSS, YRC, YWF		1					
Subtotal					30	23					

HISTORY OF INDIA – (1526 A.D. – 1772 A.D.)

Unit – I

- ❖ Mughal Empire – Sources – India on the Eve of Babur’s invasion – Babur’s early life – conquests – Administration – Humayun – Shersha.

Unit – II

- ❖ Akbar the Great – Bairamkhan – War with Rajputs - Deccan Expedition – Religious Policy – Jahangir. Nurjahan.

Unit – III

- ❖ Shajahan – Aurangzeb – Decline and Disintegration of the Mughal Empire – Art and Architecture - Deccan Policy – Mughal Administration.

Unit – IV

- ❖ The rule of Marathas – Shivaji – Military achievements – Administration - Art and Architecture – Peshwas– Balaji Viswanath – Baj Rao – Balaj Baj Rao III – Third Battle of Panipat.

Unit – V

- ❖ Advent of the Europeans – The Anglo-French Rivalry – Carnatic wars – Robert Clive – Battle of Plassey – Buxar – Dual Government in Bengal.

BOOKS OF REFERENCE

1. Mahajan V. D. : India Since 1526
2. Sri Vasthava : The Mughal Empire
3. Ishwariprasad : History of Modern Indian
4. Lane Poole : History of India
5. Thirpathi R. P. : Rise and fall of the Mughal Empire

MODERN POLITICAL THOUGHT

Unit – I

- ❖ Sovereignty – Thomas Hobbes – John Locke – Political Philosophy of Rousseau – Montesquieu – David Hume – Edmund Burke.

Unit – II

- ❖ Utilitarianism – Jeremy Bentham – James Mill – John Stuart Mill – Idealist Theory of the State – Bradley – Boscawen – Immanuel Kant. – Individualism – Herbert Spencer.

Unit – III

- ❖ Socialism – Definition – Kinds of Socialism – Christian Socialism – Collectivism – Fabianism – Guild Socialism – Marxism – Karl Marx – Communism - Lenin.

Unit – IV

- ❖ Democracy – Definition of Democracy – Liberalism – Nationalism – Internationalism – Imperialism – Fascism – Nazism.

Unit – V

- ❖ Pluralism – Harold J. Laski – Bertrand Russell – Indian Political Thought – Mahatma Gandhi.

BOOKS OF REFERENCE

1. Suresh Chandra Pant : History of Western Political Thought
2. Mahajan. V.D. : Recent Political Thought
3. Sharma U. : Western Political Thought
4. Sharma U. : Modern Indian Political Thought
5. Sachdeva & Gupta : A Simple Study of Political Thought

HISTORY OF PATHFINDERS OF TAMILNADU (1680 – 1975 A.D.)

Unit – I

- ❖ Historic background of the Resurgence in Tamil Nadu – In Multi – Spheres since 17th Century – Political, Socio, Religious and cultural spheres – Social and Religious awakening.

Unit – II

- ❖ Rettaimalai Srinivasan – Rajaji – M.C. Raja – Thillaiyadi Valliammai – Viswanatha Das – K.B. Sundarambal..

Unit – III

- ❖ Ayya Vaikundar – Ramalinga Adigal – Pandithar Ayodhy Das – Ida Scudder – Pasumpon Muthuramalinga Thevar – E.V. Ramasamy – Kamarajar – Arcot Brothers - Seethakadhi.

Unit – IV

- ❖ Umarupulavar – G. SubramaniyaIyer – Bharathiyar as a Journalist - V.O. Chidambaram as a Literary Laureate – Pudumaipithan – Rukmini Devi Arundel – Pattukottai Kalyana Sundaram – Justice M.M. Ismail.

Unit – V

- ❖ Dr. Muthulakshmi Reddi – C.V. Raman – Srinivasa Ramanujan – G.D. Naidu – A.P.J. Abdul Kalam – K. Kasthuri Rangan.

BOOKS OF REFERENCE

1. Paramarthalingam, C. Religion and Social reform in Tamilnadu, Madurai, 1997.
2. Pillai, K, K, Tamilaga Varalaru, Makkalum Panpadum, Chennai 2004.
3. Rajayyan, K. History of Tamilnadu (1585 – 1982), Madurai, 1982.
4. Viswanathan, E. The Political career of E.V.R. Madurai, 1983.
5. Sivagnanam, M.P. Viduthalaiporil Tamilagam (Tamil) Vol. I & II, Chennai 2005.

“PANCHAYAT RAJ IN INDIA WITH A REFERENCE TO TAMIL NADU”

Unit – I

- ❖ Local Self Government – an Introduction – Evolution of Panchayat Raj in India – Little Republics – Local Self Government during the Chola period – The Experiment of Lord Ripon.

Unit – II

- ❖ Grama Rajya – Gandhian Principles – Bhoodan Movement – Sarvodaya Philosophy – Role of Non-Governmental Organisation in Panchayat Raj Institutions – 73rd Constitutional Amendment.

Unit – III

- ❖ Panchayat Raj System in Tamil Nadu – Development from 1947 – 2001 – Panchayat finance - Panchayat administration.

Unit – IV

- ❖ Urban Local Government – Financial administration – State control over Urban Local Government – Balvantroy Mehta Committee – Ashok Mehta Committee.

Unit V

- ❖ Rural Local Government – Village Panchayats – Panchayat Samitis – Zilla Parishad – Income of rural Local Governments – Municipalities – Corporations – 74th Constitutional development – Role of people in Panchayat Raj institutions.

BOOKS OF REFERENCE

1. Sachdheva and Durga, Simple study of Local self Government in India.
2. S.R. Maheswari and Sri Ram Maheswari, Local Government in India
3. Kumar Kalanand Mani (Ed) Panchayat Raj OR Gram Sarkar.
4. “Status of Panchayat Raj in the States and Union Territories of India, 2000” – Published by Institute of Social Science, New Delhi, 2000.
5. Panchayat Raj in Action – E.A. Narayana, Kalpaz Publication, New Delhi-2008.
6. Role of Panchayat Raj institution in sixty years of Independence India – Kanishka Publications, New Delhi- 2008.

FREEDOM MOVEMENT IN INDIA

Unit – I

- ❖ Rise of Indian Nationalism – Birth of Indian National Congress – Aims – Surat Split – Moderates – Extremists - Militant Nationalism – Muslim League – Home Rule Movement.

Unit – II

- ❖ Gandhian Era – Rowlatt Satyagraha of 1919 – Non-Co-operation Movement – Boycott – Chauri Chaura incident – The Swarajya party.

Unit – III

- ❖ Simon Commission Report – Nehru Report – Muslim Reaction – Jinnah’s 14 points – Poorna Swaraj Resolution.

Unit – IV

- ❖ Civil Disobedience Movement – Salt Satyagraha – Gandhi – Irvin Pact – Round Table Conferences – Communal Award – Poona Pact – Cripp’s Mission – Failure.

Unit V

- ❖ Quit India Movement – Resolution – Arrest of Leaders – Mass Movements – Failure – Indian National Army – Wavell Plan – Cabinet Mission Plan – Mountbatten Plan – Independence Act of 1947.

BOOKS OF REFERENCE

1. V.D. Maharajan : Modern India
2. Majumdar R.C. : Advanced History of Modern India
3. P.E. Roberts : History of British India
4. Sumit Sarkar : Modern India
5. R.C. Agarwal : Constitutional Development of India and Freedom Movement

GANDHIAN THOUGHT (TRUTH AND NON-VIOLENCE)

Unit – I

- ❖ Truth – Its Meanings – Evolution of Truth – Truth and World Religion – Truth and Great Thinkers and Philosophers.

Unit – II

- ❖ Gandhian Conception of Truth – God is Truth and Truth is God – Experiments in Truth – Absolute Truth and Relative Truth – Realization of Truth and Educating the People – Truth and Non-Violence.

Unit – III

- ❖ Non-Violence – It's Meaning and the Conceptual Frame work.

Unit – IV

- ❖ Non-Violence and World Religion – Non-Violence and Great Thinkers and Philosophers – Non-Violence and its application.

Unit V

- ❖ Theories of Non-Violence – Types of Non-Violence – Inaction, Violent Action and Non-Violent Actions – Passive Resistance – Non-Violent Direct Action – Sathyagraha – Non-Violent or Non-Existence.

BOOKS OF REFERENCE

1. Gandhi. M.K., Non-violence in War & Peace, 2 vols. Navajeevan Publications, Ahmadanad.
2. Horsburg, H.J.N., Non-violence and Aggression.
3. Kantilal Shah, Vinoba on Gandhi, Ch.9 & 10.
4. Mahadevan, T.K., Truth and Non-violence, Gandhi Peace Foundation, Delhi.
5. Richard B. Gregg, The Power of Non-violence, Navajeevan Publications, Ahmadabad.
6. Theo P. Lentz, Towards a Science of Peace.
7. Yogendra Singh, Traditions of Non-violence.

HISTORY OF INDIA (1772 A.D. – 1947 A.D.)

Unit – I

- ❖ Lord Warren Hastings – Reforms – Impeachment – Lord Cornwallis – Reforms – Permanent Revenue Settlement – Lord Wellesley – The subsidiary alliance – Conquests – Anglo – Marathawars – Lord Hastings – Lord William Bentinck – Reforms – Ranjith Singh – Anglo Sikh Wars.

Unit – II

- ❖ Lord Dalhousie – Reforms – Doctrine of Lapse – Annexations – Sepoy Mutiny of 1857 – Nature, causes and results – Lord Canning – Lord Lyton – Lord Ripon - Lord Curzon – partition of Bengal.

Unit – III

- ❖ Constitutional development – Regulating Act of 1773 – Charter Act of 1793, 1813, 1833, 1853 – Act of 1858 - The Act of 1861 – The Act of 1892 – Minto Morley Reforms of 1909 – Montagu Chelmsford Reforms of 1919 – Government India Act of 1935.

Unit – IV

- ❖ Socio – Religious reform movements – Development of Education – Growth of local self government – Impact of British rule in India Vaikkam movement – Legacy of British rule.

Unit – V

- ❖ Emergence of Nationalism – Indian National Congress - Indian National Leaders: Dadabai Naoroji – Surendranath Banerji – Gokhale – Thilak – Annie Besant – Mahatma Gandhi – Jawaharlal Nehru.

BOOKS OF REFERENCE

1. Mahajan V. D. : India Since 1526
2. Roberts, P.E : History of British India
3. Majumdar, R.C. : An advanced History of India
4. SumitSarkar : Modern India
5. Sathianathair : History of India
6. Rai Choudri, S.C : History of Modern India
7. Grovet B.L : A new look on Modern India History

INDIAN ADMINISTRATIVE SYSTEM

Unit I: **Introduction**

Characteristics of Indian Administration during Colonial Rule – Constitution Contemporary Administrative Context.

Unit II: **Central Government – I**

Framework – Secretariat – Ministry of Home Affairs – Ministry of Finance – Ministry of Defence – Ministry of External Affairs – Planning Commission and National Development Council – Constitutional authorities

Central Government – II

All India Service – Indian Administrative Service – Central Civil Services – Training for Civil Servants – O & M in Central Government – Centre - State Relationship – Administrative Reforms.

Unit III

The Election Commission – Attorney General of India – Special Officers for the SC's and ST's - Special Officers for Linguistic minorities – The Finance Commission – Advisory Committees – Administration of Public Sector Undertakings.

Unit IV: **State and Local Government**

State Secretariat – Board of Revenue – District Administration – State Services – Rural and Urban Local Government – Panchayat Raj and the Ashok Mehta Committee – The 73rd & 74th Constitutional Amendments.

Unit V: **Issues in Indian Administration**

Challenges before Indian Administrative – Civil Servant Relationship – Administrative Corruption and Administrative Accountability

BOOKS FOR REFERENCE

1. Shriram Maheswari, Indian Administration (New Delhi: Orient Longman, 1993 4th Edition)
2. Avasthi & Maheswari, Public Administration (Agra: LakshminarainAgarwal, 1995) 21st Edition
3. T. N. Chaturvedi, Organization of Government of India (New Delhi: IIPA, 1985).
4. S. R. Maheswari, The Administrative Reforms Commission (New Delhi : Atmaram, 1982)
5. D. P. Singh, Problems of Public Administration in India (New Delhi: Chand & Co., 1980).

PRINCIPLES AND METHODS OF ARCHAEOLOGY

Unit – I

- ❖ Definition and Scope: Archaeology and Allied Subjects – Kinds of Archaeology Underwater Archaeology – Aerial Archaeology – Salvage Archaeology – Value of Archaeology: as a Primary Source – Resource of Historical Relics – Understanding our Heritage.

Unit – II

- ❖ History of Archaeology in India: Sir William Jones – James Princep – Alexander Cunningham – Robert Bruce Foote – Lord Curzon – John Marshall – Mortimer Wheeler – Post-Independence Era.

Unit – III

- ❖ Surface Exploration: Map Reading – Historical Literature – Local Tradition – Aerial Photography – Scientific Aids in Exploration.
- ❖ Excavation: Trial Trench – Rectangular Trenching System – Horizontal Excavation Open Stripping – Quadrant Method.

Unit – IV

- ❖ Dating Methods: Radio – Carbon Dating – Thermoluminescence Dating – Dendrochronology.
- ❖ Documentation and Preservation: Pottery yard – Photographic Documentation – Register – Excavation Report – Conservation of Artifacts – Wood, Glass, Metal Objects – Museum Display.

Unit – V

- ❖ Indian Archaeological Sites: Harappa – Mohanjo-daro – Nalanda – Dwaraka – Adichanallur – Arikamedu – Kaviripumpattinam.

BOOKS OF REFERENCE

1. Childe U.G. : A Short Introduction to Archaeology
2. David Browne : Principles and Practice in Modern Archeology
3. Ekambaranathan A. : Archaeological Excavation Techniques
4. Mahalingam T.V : Excavation in Lower Cauveri Basin
5. Rajan K. : Archaeology – Principles and Methods
6. Raman K.V : Principles and Methods of Archaeology
7. Sankalia H.D. : New Archaeology – The Scope and Application in India
8. Venkatraman R. : Indian Archaeology – A Review.

EPIGRAPHY

Unit – I

- ❖ Introduction – Importance of Epigraphy – Origin and Growth – Kinds of Inscriptions – Literary, Political, Religious, Memorial, Legal, Welfare, Social Status and Spurious – Contents and Conventions.

Unit – II

- ❖ Evolution of Scripts – Paleography – Pictograph – Ideograph – Phonograph – Logograph – Cuneiform – Graffiti – Linear – Brahmi – Vatteluthu – Grantha – Writing materials – Decipherment.

Unit – III

- ❖ Dating System – Eras – Saka Era – Kali Era – Vikrama Era – Kollam Era – Estempaging of Inscriptions.

Unit – IV

- ❖ Eminent Epigraphists – George Buhler – J.F.Fleet – James Burgess – H. Krishna Sastri – V.Venkayya – B.L. Rice – Robert Sewell – E. Hultzeh – K.V. Raman.

Unit – V

- ❖ Inscriptions – Case Studies – Velivikkudi Grant – Uttaramerur Inscription – Kuram Copper Plates – Kanyakumari Inscriptions.

BOOKS OF REFERENCE

1. Subramanian, T.N. : South Indian Temple Inscriptions
2. Sadasiva Pandaratar T.V. : Pirkala Cholar Varalaru
3. Sircar, D.C. : Indian Epigraphy
4. Dikshidar, V.R.R : Select South Indian Inscriptions.

SOCIAL REFORMERS OF MODERN INDIA

Unit I

Rajaram Mohan Rai – DayanandSaraswathi – Sir Syed Ahmed Khan – Swami Vivekananda.

Unit II

Jothiba Phule – Dr.Ambedkar – Pandit Aythyadas

Unit III

Ranade – Dadabai Nauroji – R. C. Dutt

Unit IV

Ramalingar – Vaikuntasamy – Narayana Guru – Ayyankali – Swami Sahajananda

Unit V

Periyar E. V. R. –Vinoba Bhave – Jayaprakash Narayan.

BOOKS FOR REFERENCE

1. B. Sobhanan, Temple Entry Movement and the Sivakasi Riots, Madurai, 1985
2. Dr. R. Ponnu, Sri Vaikuntaswamigal and the Struggle for Social Equality in South India, Ram Publishers, Madurai, 2000
3. T. P. Kamalanathan, Scheduled caste struggle for Emancipation in South India, Tirupattur, 1985
4. V. R. Krishna Ayyar, Social Democracy and Dalit Egalite, University of Madras, 1989
5. Dr.P.Mohan, Scheduled caste: History of Elevation in Tamilnadu, 1900 – 1955, New Era Publication, 1993
6. B. S. Chandrababu, Social Protest and its impact in Tamilnadu with respect to Self Respect Movement, 1920 – 1940, Madras, 1993.
7. K. R. Hanumantan, Untouchability – A Historical study upto 1500 A.D., Madras, 1972
8. Guru Nataraja, P, Life and Teaching of Narayanaguru, Ernakulam, 1968
9. M.S.A., Rao, Social Movements of Social Transformation, Madras, 1979.
10. kh.ngh. rptQhdk;, ts;syhh; fz;l xUikg;ghL.
11. f. Kfpyd;, lhf;lh;. gp.Mh; mk;Ngj;fhh; tho;f;if tuyhW.
12. tp. rPdpthrd;, jPz;lhikiaj; jPapL, kq;ifg; gjpg;gfk; rpjk;guk;-2014.
13. tp. rPdpthrd;, Mjppjuhtplh; Gdh;tho;Tk; jtj;jpU. Rthkp , rf[he;jhTk;, rpjk;guk;-2001

INDIAN CONSTITUTION

Unit – I

- ❖ Framing of the Indian Constitution – Salient Features of the Indian Constitution – Preamble.

Unit – II

- ❖ Fundamental Rights and Fundamental Duties – Directive Principles of State Policy – Amendments.

Unit – III

- ❖ The Executive: President – Vice-President – Cabinet and the Prime Minister. The State Government: Governor and Chief Minister.

Unit – IV

- ❖ The Legislature: Lok Sabha – The Speaker. Rajya Sabha: The Process of Law – Making.

Unit – V

- ❖ The Judiciary – The Supreme Court and High Courts – Judicial Review.

BOOKS OF REFERENCE

1. Sharma M.P : The Government of Indian Republic.
2. Kapur Anupchand : Select Constitutions
3. Gokhale B.K : Political Science
4. Dubey S.N. : World Constitutions
5. Kapur A.C : Constitutional History of India

**MANONMANIAM SUNDARANAR UNIVERSITY
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UG COURSES – AFFILIATED COLLEGES

**B.C.A
(Choice Based Credit System)**

(with effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem.	Pt. I/II/ III/ IV/ V	Sub. No.	Subject status	Subject Title	Hrs/ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	III	15	Core – 3	JAVA PROGRAMMING	6	4	25	75	100	30	40
		16	Core – 4	ESSENTIAL OF FINANCIAL ACCOUNTING	6	4	25	75	100	30	40
		17	Major Practical – III	JAVA PROGRAMMING LAB	6	4	50	50	100	20	40
		18	Allied -III	DATA STRUCTURE	4	4	25	75	100	30	40
		19	Allied Practical – III	DATA STRUCTURE LAB	2	-	50	50	100	20	40
IV	IV	20	Skilled Based subject –I	DTP,PAGEMAKER, PHOTOSHOP	4	3	25	75	100	30	40
IV	IV	21	Non-Major Elective – I (Choose any one)	(A) INTRODUCTION TO INFORMATION TECHNOLOGY (B)INTRODUCTION TO COMPUTERS	2	2	25	75	100	30	40
SUB- TOTAL					30	21					

Sem.	Pt I/II/ III/ IV/V	Sub No.	Subject status	Subject Title	Hrs/ week	Cre - dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	III	22	Core - 5	VISUAL BASIC	6	4	25	75	100	30	40
		23	Major Practical - IV	VISUAL BASIC LAB	6	4	50	50	100	20	40
		24	Major Elective-I (Select any one)	(A) MICRO PROCESSOR (B)ELECTRONIC COMMERCE (C)SYSTEM PROGRAMMING	6	5	25	75	100	30	40
		25	Allied - IV	RESOURCE MANAGEMENT TECHNIQUES	4	4	25	75	100	30	40
		26	Practical - IV	DATA STRUCTURE LAB	2	2	50	50	100	20	40
IV		27	Skilled Based subject - II	FLASH	4	3	25	75	100	30	40
IV		28	Non Major Elective-II (Choose any one)	(A) INTRODUCTION TO INTERNET & HTML (B) MSWORD	6	2	25	75	100	30	40
V			Extension Activity	NCC,NSS, YRC, YWF		1					
SUB- TOTAL					30	25					

JAVA PROGRAMMING

UNIT -I

Java language fundamentals: The building blocks of Java – Data types – Variable declarations – Wrapper classes – Operators and assignment – Control structures – Arrays – Strings.

UNIT- II

Java as an OOP language: Defining classes – Modifiers – Packages – Interfaces

Exception handling: Introduction – Basics of exception handling in JAVA – Exception hierarchy – Constructors and methods in throwable classes – Unchecked and checked exceptions – Handling Exceptions in Java

UNIT- III

Multithreading: Creating threads – Thread life-cycle – Thread priorities and thread scheduling – Thread synchronization. File and I/O streams: Java I/O – File streams – File Input Stream and File Output Stream – Filter streams

UNIT- IV

Applets: Java applications versus Java applets – Applet Life-cycle – working with applets – the HTML APPLET tag. Database handling using JDBC: JDBC architecture – working with JDBC – Processing queries – Transaction commit and Rollback – Handling exceptions – Accessing Metadata

UNIT- V

The Abstract Window Toolkit: Basic classes in AWT – Drawing with graphics class – Class hierarchy of AWT – Event handling – AWT controls – Layout managers.

Text Book:

Object Oriented Programming through JAVA – P. Radha Krishna – Universities Press

Reference Books:

1. Programming with Java – C. Muthu
2. Programming with Java 2 – C. XAVIER
3. Introduction to OOP through Java – ISRD Group Tata McGraw hill
4. Programming with Java a primer 3/E E. BALAGURUSWAMY
5. The Complete Reference JAVA 25/ E HERBERT SCHILDT

ESSENTIALS OF FINANCIAL ACCOUNTING

UNIT- I

Introduction to Accounting : Need for Accounting – Accounting as the language of business – Attributes and steps of Accounting – Book keeping Vs Accounting – Branches of Accounting – Methods of Accounting – Types of Accounting – Accounting Rules - Bases of Accounting – Accounting terminology

Basic Accounting Concepts: Meaning and classification of Accounting -Accounting Concepts – Accounting Conversion – Accounting equations

UNIT- II

Recording a Financial Data: Memorandum Book, business transaction, Journal, Rules for Debit and Credit, Compound Journal entry, Advantages of Journal, Ledger, Ledger Account, Ledger Posting, Process of Posting, Balancing of An Account, Significance of Balances, Relation between Journal and Ledger-Subsidiary Books

UNIT- III

Trial Balance: Objects, Methods of Preparing Trial balance, how to locate errors, hits for the preparation of trial balance & problems

UNIT- IV

Final accounts: Trading account – individual items posted to the debit of trading account – individual items credited to trading account – advantages of trading account – profit & loss account - advantages of profit & loss account- manufacturing account- balance sheet- classification of assets & liabilities.

UNIT- V

Accounts of non Profit organizations: Introduction – Final accounts of no trading concerns- receipts and payments account – features- income & expenditure account – feature- distinction between the two – treatment of special items – some important adjustments – types of problems – Distinction between income and expenditure account and profit and loss account – accounts of professional men

Text Book:

1. *Financial Accounting by T.S.Reddy, A.Murthy – Margham Publications, Chennai*
2. *Fundamentals of Advanced Accounting by R.S.N.Pillai, Bagavathi, S,Uma*

Reference Books:

1. *Essentials of Financial Accounting – by Asish K.Bhattacharaya, PHI Private Limited.*
2. *Advanced Accountancy by S.P.Jain and Narang – Kalyani Publications, New Delhi*

JAVA PROGRAMMING LAB

1. Write a java program to find the area of Square, Rectangle, and Triangle by
 - a. Overloading Constructor
 - b. Overloading Method
2. Define a class called student with data members name, Rollno, and age. Write a suitable constructor and method output () to display the details. Derive another class student 1 from the student with the data member's height and weight. Write a suitable constructor and method output () to display the details which overwrites the super class method output ().(Apply Method Overriding concepts)
3. Write a java program to create a package "Employee" which contains the classes Emp and Emppay. The data members of Emp are name, emp_id, category, and Bpay. Write suitable constructor and methods to compute the net pay of the employee. The class Emppay contains the main method.
4. Write a java program to create and Implement an Interface.
5. Write a java program to create a thread
 - b. Using Thread Class
6. Write a java program to Design a calculator to perform arithmetic operations.
7. Create an applet with four Checkboxes with labels and a Text area object. The program must display the details while clicking a particular checkbox.
8. Write a java program to demonstrate the use of choice box.
9. Write a java program, which creates a window with a checkbox group with boxes for the colors, violet, indigo, yellow, orange, red, blue and green. When the button is selected the background color must change accordingly
10. Write a java program to throw the following Exception
 - a. Negative Array Size
 - b. Array Index Out OF Bounds
11. Write a java program to create a file menu with option New, Save and Close, Edit menu with option cut, copy, and paste
12. Write a java programming to illustrate Mouse Event Handling.

DATA STRUCTURES

UNIT- I

Introduction: Pseudo code – The Abstract Data Type – A Model for an Abstract Data Type – Algorithms Efficiency.

Searching: List Searches – Hashed List Searches – Collision Resolution

UNIT- II

Linked Lists: Linear List Concepts - Linked List Concepts - Linked List Algorithms – Processing a Linked List – Complex Linked List Structures

UNIT- III

Stacks and Queues: Basic Stacks Operations – Stack Linked List Implementation – Stack Applications – Queue Operations – Queue Linked List Design

UNIT- IV

Trees: Basic Tree Concepts – Binary Tree - Binary Tree Traversals – Expression Trees- General Trees – Binary Search Trees – Heap definition – Heap Structure – Basic Heap Algorithm.

UNIT- V

Sorting And Graphs: General Sort Concepts – Quick sort – External sorts

Graphs: Terminology – Operations – Graph storage Structure – Networks.

Text books:

Data Structures a Pseudo code Approach with C++, Richard F. Gilberg & Behrouz A forouzan, Thomsan Brooks / Cple.

Reference Books:

1. Fundamentals of Data Structures Eilis Horowitz & Sartaj GalGotia Publications
2. Data Structures & Algorithm in Java third edition – Adam Drozdek.

DATA STRUCTURES LAB

1. Write a C++ program to implement sequential search and Binary search in array.
2. Write a C++ program to implement linked list and perform the following operations
 - a) Add a node as first node.
 - b) Add a node as last node.
3. Write a C++ program to implement linked list and implement the following Objects.
 - a) Delete the first node.
 - b) Delete the last node.
4. a. Write a C++ program to implement a stack linear list perform the push and pop Operations.
 - b. Write a C++ program to implement a queue using circular list and implement add and delete operations.
5. Write a C++ program to implement binary tree using Linked and perform the following traversal
 - a. In order traversal
 - b. Pre order traversal
 - c. Post order traversal
6. Write a C++ program to implement graph using Adjacency matrix and perform the following operations
 - a. Depth first search
 - b. Breath first search
7. Write a C++ program to implement merge sort.
8. Write a C++ program to implement quick sort.

SKILLED BASED SUBJECTS SYLLABUS

Skill based subjects are practical oriented; One hour should be assigned for tutorial class and three hours of practical to do the given practical list.

OPTIONAL – I

DTP

Samples should be provided to the students for designing the given list.

Page Maker

1. Design of ID card (3”X2”) / Visiting card (3.5”X2”).
2. Design of an attractive Invitation card (5.5”X8”) / letter pad (7.5”X9”).
3. Preparation of a small booklet with 6 pages (3.6”X4.5”).
4. Design a handbill (5.5”X8.5”) / advertisement.
5. Design your college progress card / a Receipt bill with counter foil.

Photoshop

1. Design of a brochure for an institution.
2. Seasonal greeting card.
3. Transporting an image from one background to another.
4. Design a web page poster (1004x750) / Textbook cover page.
5. Crop an image/ rotate an image.

INTRODUCTION TO INFORMATION TECHNOLOGY

UNIT- I

Information Technology Basics: Introduction, Information, Technology, Information Technology, Present Scenario, Role of Information Technology, Information Technology and internet, Careers in IT Industry.

Computer Organization and Architecture: Central Processing Unit, inside a computer, Data representation in Computer, Coding Schemes.

UNIT- II

Computer Memory and Storage: Introduction, Memory Hierarchy, Random Access Memory (RAM), Read Only Memory (ROM), RAM, ROM and CPU interaction, Types of Secondary storage devices, Magnetic tape, Magnetic disk, types of magnetic disk, optical disk, type of optional disks.

UNIT -III

Input, Output Media: Introduction, types of input devices, types of output devices, Multimedia Essentials: Introduction, Multimedia definition, Building blocks of Multimedia, Multimedia system, Multimedia applications, Virtual reality.

UNIT- IV

The Internet: Introduction, Evolution of Internet – Basic Internet terms – Getting Connected to Internet – Internet Applications – Data over Internet.

Internet tools: Introduction – Web Browser – Browsing Internet using Internet Explorer – E-Mail – Search engines – Instant messaging.

UNIT -V

Emerging trends in IT: Introduction, E-Commerce – Electronic Data Interchange – Mobile Communication – Bluetooth – Global Positioning System – Infrared Communication – Smart Card – Imminent Technologies.

Text Book:

Introduction to computer and Information Technology, D.Glory Ratha Mary, S.Selvanayahi, Shekina Publications.

Reference Books:

1. Introduction to Information Technology ITL Education Solution Limited, Pearson Education.
2. Fundamental of Information Technology By Alexis Leao & Mathews Leon Vikas Publication – New Delhi.

INTRODUCTION TO COMPUTERS

UNIT- I

Computer Basics: Introduction, Characteristics of Computers – Evolution of Computers, Generation of Computers, Classification of Computers, The Computer System, Application of Computers.

UNIT- II

Computer Organization and Architecture: Central Processing Unit, inside a computer, Data representation in Computer, Coding Schemes.

UNIT -III

Input/Output Units: Computer input units, Computer output units.

UNIT- IV

Computer Memory and Storage: Introduction, Memory Hierarchy, Random Access Memory (RAM), Read Only Memory (ROM), RAM, ROM and CPU interaction, Types of Secondary storage devices, Magnetic tape, Magnetic disk, types of magnetic disk, optical disk, type of optional disks.

UNIT- V

Operating System: Introduction, Operating System, Definition, Evolution of Operating System, Types of Operating System, Functions of Operating System.

Computer Software: Introduction, Computer Software, Definition, Categories of Software, Installing and Uninstalling software, Software piracy, Software terminologies.

Text Book:

Introduction to computer and Information Technology, D. Glory Ratha Mary, S. Selvanayahi, Shekina Publications.

Reference Books:

- 1. Introduction to computer, Peter Norton Tata McGraw Hill*
- 2. Fundamental of Information Technology By Alexis Leao & Mathews Leon Vikas Publication – New Delhi.*

VISUAL BASIC

UNIT- I

Getting started with Visual Basic 6.0: Introduction to Visual Basic, Visual Basic 6.0 Programming Environment, Working with Forms, Developing an Application, Variables, Data types and Modules, Procedure and Control Structures, Array in Visual Basic, Additional examples.

Working with Controls: Introduction, Creating and Using Controls, Working with Control Arrays, Additional examples.

UNIT- II

Menus, Mouse Events and Dialog Boxes: Introduction, Mouse Events, Dialog Boxes, Additional examples. Graphics, MDI and Flex Grid: Introduction, Graphics for Applications, Multiple Document Interface (MDI), using the flex Grid Control, Additional examples.

UNIT- III

ODBC and Data Access Objects: Evolution of Computer Architecture, Data Options, Additional examples. ODBC Using Data Access Objects and Remote Data objects: Open Database Connectivity (ODBC), Remote Data objects, Additional examples.

UNIT- IV

Data Environment and Data Report: Introduction, Data Environment Designer, Data Report, Additional examples.

Object Linking and Embedding: Introduction, OLE Fundamentals, Using OLE Container Controls, Using OLE Automation Objects, OLE Drag and Drop, Additional examples.

UNIT- V

Built – in Active X Controls: Working with Built – In Active X Controls, Additional examples. Working with Active X Data objects; An Overview of ADO and OLE DB, ADO Object Model, Additional examples.

Files and File System Controls: Introduction, File System Controls, Accessing Files, Interface with Windows, Additional examples.

Text Book:

Visual Basic 6.0 Programming – Content Development Group – Tata McGraw hill Publishing Company Limited, New Delhi.

Reference Books:

1. Microsoft Visual Basic 6.0 Professionals, Michael Halvorson – PHI
2. Visual Basic 6 in Record Time by Steve Brown, BPB Publications.
3. Visual Basic 6 from the Ground UP – Gary Cornell - Tata McGraw hill

VISUAL BASIC

1. Design of an Analog Clock.
2. Design of a Desktop Calculator.
3. Design of a Color Mixer using basic colors.
4. Create an application to format text inside a text box.
5. Create an application using File controls and use two option buttons to show and hide a picture in the picture box.
6. Create an Application to do Matrix Addition using Flex Grid Control.
7. Create an Editor with File and Edit menus using Menu Editor Tool.
8. Create an MDI application with tile and cascade child forms.
9. Create an Application to implement OLE Drag and Drop
10. Create a mailing address database in Access and view the records using Data Control
11. Create a student database Application using ADO
12. Create a student database in Access and prepare a Report using Data Report Control

MICROPROCESSOR

UNIT- I

Microprocessors, Microcomputer and Assembly Language: Microprocessors – Microprocessors Instruction set and Computer Languages – Computers to single chip microcontrollers.

Mention to 8085 assembly language Programming: The 8085 Programming model action Classification – Instruction, data format and storage – How to write, store and execute simple program, Overview of 8085 instruction set – Writing and assembling a program.

UNIT-II

Microprocessor Architecture and Micro Computer Systems: Microprocessor Architecture and its operations – Memory – Input and Output (I/O) – Example of a Micro Computer System.

Microprocessor Architecture and Memory interfacing: The 8085 MPU – Example 8085 based microcomputer - Memory interfacing - Interfacing the 8155 memory

UNIT- III

Data transfer operation: Arithmetic operations – Logic operations – Branch operations - Writing assembling Language programs – Debugging a program.

Programming techniques with additional Instruction: Programming techniques – Counting and Indexing – Additional data transfer and 16 bit arithmetic operations – Arithmetic operations related to memory - Logic operations related to memory - Logic operations – Rotate – Dynamic debugging.

UNIT- IV

Counters and Time Delays: Counters Time Delays – Hexadecimal counter - Modulo ten counters – Pulse Wave forms – Debugging counter and time Delay programs.

Subroutine: Stack – Subroutine – Restart – Conditional call and Return subroutine concepts.

UNIT- V

BCD to Binary conversion – Binary to BCD conversion - BCD to seven segment LED code conversion – BCD addition – BCD Subtraction – Multiplication- Subtraction with carry.

Text Books:

1. Ramesh S. Goanker - *Microprocessor Architecture Programming and Applications with the 8085 – 5th Edition, Penram International Publiser*

2. *Microprocessor and Microcontrollers* N.Senthil Kumar, M.Saravanan, S.Jeevananthan. Oxford University Press.

Reference Book:

1. *8085 Microprocessor Programming and Interfacing* N.K.Srinath, PHI Publication.

ELECTRONIC COMMERCE

UNIT- 1

What is Electronic Commerce? – Types of Electronic Commerce Technology.

UNIT- II

Types of E-Business Models and Markets - Types of E-Commerce Providers and Vendors - E-Commerce website Creation

UNIT- III

Managing E-Commerce website Development – Building Shopping Cart Applications – Mobile Electronic Commerce.

UNIT- IV

Enhancing a web server with E-Commerce Application Development – Strategies, Techniques and tools – Implementing Merchandising Strategies – Implementing E-Commerce Databases

UNIT- V

Applying and Managing E-Business Intelligence Tools for Application Development – Types of Security Technologies – protocols for the Public Transport of Private Information

Text Books:

- 1. Electronic Commerce, by Pete Loshin and John Vacca, Fourth edition, Firewall Media, New Delhi.*
- 2. E-Business Parag Kulkarni, Sunita Jahirabadkar, and Pradip Chande. Oxford University Press.*

Reference Books:

- 1. Electronic Commerce, by Gary O.Schnelder James T.Perry, First edition 2000, Thomson Learning.*
- 2. Electronic Commerce, by Elias M.Awad, Prentice Hall of India 2002.*

SYSTEM PROGRAMMING

UNIT -I ASSEMBLERS

General design procedure – design of assembler – statement of problem – Data structure – Format of database – Algorithm – Look for modularity – table processing – Searching and Sorting – Linear search – Binary search – Interchange sort – shell sort – Radix exchange sort – Address Calculation sort – Comparison of sorts – hash or random entry searching.

UNIT-II MACROLANGUAGE AND MACROPROCESSOR

Macro instructions – Features of macro facilities – Macro instruction arguments – conditional macro expansion – Macro calls within macro – macro instruction – defining macro – implementation – Two – pass – Algorithm – Single – pass – Algorithm – implementation of macro calls within macros – implementation within an assembler.

UNIT- III LOADERS

Loader schemes – Compile and Go General – Absolute Loaders – Subroutine Linkages – Relocating – Direct Linking Loader – Binders - Linking Loaders – Overlay – Dynamic binder – Design of an absolute Loader - Design of direct Linking Loader – specification of problem - specification of Data structure - Format of database – Algorithm.

UNIT -IV COMPILER

Statements of problem – recognizing basic elements – recognizing syntactic units and interpreting meaning – Intermediate form – storage allocation – Code generation – General model of compiler.

PHASES OF THE COMPILER

Lexical Phase – Syntax phase – Interpretation phase – optimization – storage assignment – code generation – assembly phase – passes of a compiler.

UNIT -V

Statement of problem – Implementation – Recursion, call and return statements – storage classes – use - static storage – Automatic storage – Internal controlled storage – External controlled storage – Based storage - Implementation – static storage – Automatic storage - controlled and based storage – Block structure – accessing information for block structure – storage allocation for block structure – Non – local Goto's – Interrupts – pointers.

Text Book:

John J.Donavan "System programming" Tata McGraw Hill Edition (1991)

Reference Book:

D.M.DHAMDDHERE "System programming and Operating system". Tata McGraw Hill Publishing Company Limited.

RESOURCE MANAGEMENT TECHNIQUES

UNIT-I

Linear Programming I: Introduction – Advantages and disadvantages of LP – Basic characteristics of LP – General linear Programming problem – Algebraic solution of a LP(Simplex Method), Linear Programming II: Duality in LPP – Dual Simplex method.

UNIT -II

Assignment Problem: Introduction – Definition and Mathematical formulation – Methods of solutions – Application area of AP – Comparison between AP and TP – Basic theorems – Hungarian method – Exceptional cases of AP – AP with restrictions – Multiple optimal solution of an AP.

UNIT -III

Job sequencing problems: Introduction, Basic terms and Notations used in Sequencing – Priority sequencing rules – Gantt Chart – Types of Job sequencing problems.

Network models: Introduction – Basic features of Network models – Main advantages of Network models – Network models – Minimum spanning tree algorithm – Shortest route problem – Maximum flow and minimum cost flow problems – Travelling salesman problem as a network model – Unifying model: Minimum cost flow network – Linear programming approach to a network model.

UNIT-IV

Project management: Introduction – Basic concepts – Project planning techniques – CPM & PERT techniques – Critical path method –The PERT approach – Expected length of a project - Probability of project completion by due date – cost consideration in project scheduling – similarities and differences in CPM & PERT.

UNIT -V

Game theory: Introduction – Definitions and Terminology – Basic game theory models – Fundamental Principles of game theory – Assumptions underlying game theory – Pure strategies: Games with saddle point – The rules of Dominance – mixed strategies: Games without saddle point – Solution of $2 \times n$ and $m \times 2$ Games(graphical approach) – Linear programming solutions of Games.

Inventory control: Fundamentals of Inventory theory – Basic terminology – Advantages & disadvantages of Inventory – formula for the quantity to order and lead time – EOQ with price-breaks.

Text Book:

Operations Research Models & Methods – Chandrasekhar Salimath, Bhupender parashar – Universities press 2014.

Reference Books:

1. *Operations Research – Nita H.Shah , Ravi M. Gor, Hardik Soni – PHI Learning Private Limited, New Delhi, 2009*
2. *Operations Research – P.K.Gupta*
3. *Operations Research - Taha*

DATA STRUCTURES LAB

1. Write a C++ program to implement sequential search and Binary search in array.
2. Write a C++ program to implement linked list and perform the following operations
 - c) Add a node as first node.
 - d) Add a node as last node.
3. Write a C++ program to implement linked list and implement the following Objects.
 - c) Delete the first node.
 - d) Delete the last node.
4. a. Write a C++ program to implement a stack linear list perform the push and pop Operations.
 - b. Write a C++ program to implement a queue using circular list and implement add and delete operations.
5. Write a C++ program to implement binary tree using Linked and perform the following traversal
 - d. In order traversal
 - e. Pre order traversal
 - f. Post order traversal
6. Write a C++ program to implement graph using Adjacency matrix and perform the following operations
 - a. Depth first search
 - b. Breath first search
7. Write a C++ program to implement merge sort.
8. Write a C++ program to implement quick sort.

SKILLED BASED SUBJECTS SYLLABUS

Skill based subjects are practical oriented; One hour should be assigned for tutorial class and three hours of practical to do the given practical list.

OPTIONAL - 2

FLASH

1. Create a SIMPLE Presentation.
2. End a movie clip using script.
3. Start a graphic animation at a specific frame.
4. Text animation using motion twining
5. Activate a new window / page using buttons.
6. Bouncing ball with sound effect.
7. Create a scrolling gallery in a page

INTRODUCTION TO INTERNET WITH HTML

UNIT- I

Introduction to Internet: Computer is business-networking-internet- e-mail-gopher-world wide web, Internet Technologies – Internet Browsers.

UNIT- II

Introduction to HTML: History of HTML - HTML generation and Documents – Tags and Links – Head and Body Section.

UNIT-III

Designing Body Section – Ordered and Unordered List – Table Handling

UNIT- IV

Introduction to DHTML: Features of DHTML – Defining styles – Working with Colors – Text and Fonts with Style.

UNIT- V

Frames – Frame set Definition – Nested frames – A web design project – forms.

Text Book:

World Wide Design with HTML by C.XAVIER – TMH Publications.

Reference Book:

Fundamental of the internet and the World Wide Web by Greenlaw and Hepp. TMH Publications.

MS WORD

UNIT- I

Introduction to Microsoft Word 2003

UNIT- II

Creating a document in Microsoft Word 2003

UNIT -III

Working with tables, Charts and Graphics – MAILMERGE.

UNIT- IV

Additional Commands of Microsoft Word 2003

UNIT- V

Menu Commands of Microsoft Word 2003

Text Book:

Straight to the Point Microsoft Word 2003, Firewall Media

Reference Books:

- 1. Gini Courter & Annette Marquls – Microsoft Office 2000 No Experience required, BPB Publications.*
- 2. Stephen L. Nelson - Office 2000: The complete reference, Tata McGraw Hill Publishing Company Limited.*

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

B.Com Corporate Secretaryship

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(45th SCAA meeting held on 09.02.2017)

Sem.	Pt. I / II/ III/ IV/V	Sub. No.	Subject Status	Subject Title	Hrs. per week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	III	13	Core – 5	ADVANCED FINANCIAL ACCOUNTING - I	6	4	25	75	100	30	40
	III	14	Core - 6	BUSINESS STATISTICS	6	4	25	75	100	30	40
	III	15	Core -7	BANKING	6	4	25	75	100	30	40
	III	16	Allied -III	COMPANY SECRETARIAL PRACTICE	6	5	25	75	100	30	40
	IV	17	Skill Based -I (Any One)	(A) BUSINESS COMMUNICATION (B) OFFICE MANAGEMENT	4	4	25	75	100	30	40
	IV	18	Non – Major Elective – I (Any One)	(A) .INTRODUCTION TO ACCOUNTANCY (B). CONSUMER AWARENESS	2	2	25	75	100	30	40
			SUBTOTAL			30	23				

Sem.	Pt. I/ II/ III/ IV/V	Sub. No.	Subject Status	Subject Title	Hrs. per week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	III	19	Core - 8	ADVANCED FINANCIAL ACCOUNTING - II	6	4	25	75	100	30	40
	III	20	Core - 9	BUSINESS MATHEMATICS	6	4	25	75	100	30	40
	IV	21	Major Elective-I (Any One)	(A). BUSINESS TAXATION	6	5	25	75	100	30	40
				(B). STOCK MARKET							
				(C). INVESTMENT MANAGEMENT							
				(D). OFFICE AUTOMATION (Theory- 4Hrs, *Practical – 2 Hrs) Internal : Theory- 20 marks Practical and Record Works-5marks							
	III	22	Allied-IV	CORPORATE FINANCE	6	5	25	75	100	30	40
	IV	23	Skill Based –II (Any One)	1.BUSINESS MODELS	4	4	25	75	100	30	40
				2.CAREER PLANNING							
				3. ENTREPRENEURSHIP DEVELOPMENT							
IV	24	Non – Major Elective –II (Any One)	(A). FINANCIAL ACCOUNTING	2	2	25	75	100	30	40	
			(B).HUMAN RIGHTS								
V		Extension Activity	NSS/NCC/YRC/YWF	-	1	-	-	-	-	-	
	SUBTOTAL				30	25					

***There is no external examination for practical**

MSU/2016-17/UG-Colleges/Part-III (B.Com Corporate Secretaryship)
Semester-III /Ppr.no.13/ Core-5

ADVANCED FINANCIAL ACCOUNTING - I

Unit I: Branch Accounting – Debtor’s system – Invoice price Method (excluding stock and Debtor’s system) – Departmental Accounts – Departmental Trading and Profit and Loss Accounts – Departmental Transfers.

Unit II: Contract Account – Completed contracts and incomplete contracts – Farm Accounting.

Unit III: Hire purchase and Instalment system – Calculation of Cash price and interest – Default and Repossession – Difference between Hire purchase and Instalment system.

Unit IV: Royalty Account – Meaning – Minimum rent – Short working – Type of recoupment - strike and lock out.

Unit V: Insolvency accounts – Insolvency of an individual – Statement of Affairs – Deficiency Account.

Text & Reference Books:

1. Dr.M.A. Arulanandam & K.S.Raman, Advanced Accountancy, Himalaya Publishing House , Mumbai
2. R.L. Gupta and M. Radhaswamy, Advanced Accountancy, Sultan Chand & Sons, New Delhi
3. M. Shukla and T.S. Grewal, Advanced Accountancy, S.Chand &Co., New Delhi
4. S.P.Jain & K.L.Narang, Advanced Accountancy, Kalyani Publishers, New Delhi.
5. T.S.Reddy & A.Murthy, Advanced Accountancy, Margham Publications, Chennai.
6. R.S.N.Pillai, Bagavathi & S.Uma, Fundamentals of Advanced Accounting, S.Chand & Company Ltd., New Delhi.

MSU/2016-17/UG-Colleges/Part-III (B.Com Corporate Secretaryship)
Semester-III / Ppr.no.14/Core-6

BUSINESS STATISTICS

Unit I: Definition of statistics – Importance – Application – Limitations - Statistical survey – Planning and design of survey – Collection of Data – Sources - primary and secondary data – Techniques – Census method and sampling method - Sampling design –Methods of sampling- Classification of data – Tabulation –Diagrammatic and graphic presentation of data .

Unit II: Measures of Central Tendency – Mean – Median – Mode – Geometric Mean -Harmonic Mean.

Unit III: Measures of Dispersion-Range – Quartile Deviation – Mean Deviation - Standard Deviation – Co-efficient of Variation. Skewness - methods of studying Skewness - Karl Pearson's Co-efficient of Skewness – Bowley's co-efficient of Skewness.

Unit IV: Correlation – meaning – types-scatter diagram – Karl Pearson's Co-efficient of Correlation- Rank correlation – Con-current deviation method. Regression analysis – uses- Regression line – Regression equations – least square method - deviations taken from actual mean and assumed mean method.

Unit V: Index numbers – meaning – types – its problems – Methods of constructing index numbers – un- weighted and weighted indices – Index number tests – Consumer price index numbers. Analysis of time series – Meaning – Importance – Components of time series – Secular trend, seasonal, cyclical and irregular variations – Measurement of trend - Graphic method – Moving average method – Method of least square.

Text & Reference Books:

1. Dr. S.P. Gupta, Statistical Method, Sultan Chand & Sons, New Delhi.
2. Dr. M. Manoharan, Statistical Methods, Palani Paramount Publications, Palani.
3. R.S.N. Pillai & Bhagavathi, Statistics-Theory and Practice, S.S. Chand & Co.
4. M. Wilson, Business Statistics, Himalaya Publishing House, Mumbai.

MSU/2016-17/UG-Colleges/Part-III (B.Com Corporate Secretaryship)
Semester-III / Ppr.no.15/Core-7

BANKING

Unit I: Banker and Customer : Relationship between banker and customer – General & Special relationship – Rights of the banker – Negotiable instruments – Promissory note, Bill of exchange & Cheque (Meaning & Features) – Proper Drawing of the cheque – Crossing (Definition & Types) – Endorsement (Definition & Kinds) – Material alteration – Statutory protection to the paying banker – Statutory protection to the collecting banker

Unit II: Banking System: Indigenous Bankers – Commercial Banks – Co-Operative Banks – Land development Banks – Industrial Development Banks - NABARD- EXIM Banks – Foreign Exchange Banks.

Unit III: Traditional Banking : Receiving Deposits – General Precaution – Kinds of deposits – Fixed – Current – Saving – Recurring & Others Lending Loans & Advances – Principles of sound lending – forms of advances – loan , cash credit , over draft & bills purchase & discounted. Mode of charging security – lien , pledge , mortgage , assignment & hypothecation.

Unit IV: Modernised Banking : Core banking – Home banking – Retail banking – Internet banking – Online banking and Offline banking – Mobile banking –Electronic Funds Transfer – ATM and Debit Card – Smart Card – Credit Card – E-Cash – Swift – RTGS.

Unit V: Reserve Bank of India : Functions of Reserve Bank of India – Methods of Credit Control – RBI'S Monetary policy – Opening New Branches – New Licence in Policy.

Text & Reference Books:

1. K.C.Sherlekar - Banking theory law and practice.
2. S.N.Lal - Banking theory law and practice.
3. M.C.Tannen - Banking theory law and practice.
4. E.Gordon and K.Natarajan - Banking theory law and practice.
5. S.S.Gulshan and Gulshan K.Kapoor - Banking theory law and practice.
6. S. Guruswamy – Banking Theory Law & Practice –3rd Edition, Vijay Nicole Imprints Private Limited, Chennai.

MSU/2016-17/UG-Colleges/Part-III (B.Com Corporate Secretaryship)
Semester-III / Ppr.no.16/Allied - III
COMPANY SECRETARIAL PRACTICE

Unit I: Secretary – Definition - kinds of secretaries - function of secretaries – qualification – appointment – dismissal - legal positions, powers, rights, duties, and responsibilities.

Unit II: Secretarial practice relating to formation of a company – secretarial practice relating to issue, allotment, calls, forfeiture and surrender of shares secretarial practice relating to transfer and transmission of shares – secretarial practice relating to dividend – register – register of members

Unit III: Secretarial practice relating to issue and redemption of debenture – borrowing powers of a company – public deposits – prevention of misuse of public deposits – debenture and debenture stock – redemption of debenture – duties of the secretary re issue of debenture

Unit IV: Meetings-kinds of meetings – requisition of valid meeting – duties of the secretary in connection with board meeting – statutory meeting, extraordinary general meeting and resolution

Unit V: Winding up – procedure for winding up – duties of secretaries in respect of winding up procedures after winding up orders - defunct company

Text & Reference Books:

1. Company Law and Secretarial Practice - P.K.Ghosh and Dr.V.Bala chander
2. Manual of Secretarial Practice - B.N.Tandon

MSU/2016-17/UG-Colleges/Part-IV (B.Com Corporate Secretaryship)
Semester-III / Ppr.no.17 (A) /Skill Based Subject- I (A)

BUSINESS COMMUNICATION

Unit I : Introduction - Importance - definition - process of communication - functions - media for communication - communication network - verbal Vs non - verbal communication - barriers to communication - various electronic communication systems.

Unit II: Business correspondence - principles of letter writing - structure and layout - planning and preparation.

Unit III: Quotations - orders - tenders - sales letters - claim and adjustment letters - credit and collection letters.

Unit IV: Job related communication - letter of application - drafting the application - elements of structure of application - Resume preparation.

Unit V: Employment interview - Types of interviews - preparation for the candidates to attend the interview - before the interview - during the interview - interview process – do's and don't and tips for the successful interview.

Text & Reference Books:

1. Ragurathan & Santharam, Business Communication, Margham Publication.
2. Ashakaul, Effective business communication, Prentice Hall.
3. R.C. Sharma & Krishnamohan, Business correspondence and report writing - third edition, Tata McGraw Hill.
4. Penrosemesberry, Advanced business communication, Myers Thomson South Western.
5. Marry Ellan, Guffey ,Thomson, Business communication, South Western.
6. P.N. Ghose Rajendra Paul, J.S.Korlahalli, Business correspondence and office management, Sultan Chand and Sons.
7. R.S.N. Pillai, Bagavathi, Office management, S. Chand & Co.

MSU/2016-17/UG-Colleges/Part-IV (B.Com Corporate Secretaryship)
Semester-III / Ppr.no.17 (B) / Skill Based Subject –I (B)

OFFICE MANAGEMENT

Unit I: Office- Meaning – Features – Importance – Office Management – Nature, Functions and Scope – Office Manager – Functions and Qualification – Flow of work – Organisation Charts

Unit II: Office Accommodation – Principles – Location of an office – Layout – Office furniture – Office Environment – Office Lighting, Ventilation, Interior Decoration – Noise and dust – Physical condition - Requirements

Unit III: Mail and Correspondence – Handling mails – Organisation of mailing department - Handling inward and outward mail – internal and external communication – Oral and written communication

Unit IV: Filing – Essentials of a good filing system – Centralised Vs Decentralised filing system – Classification of filing system – internal and external

Unit V: Indexing – Meaning – Objects – Indexing types – Forms, Control and Design – Continuous Stationery.

Text & Reference Books:

1. B.N.Tandan, Manual of Office Management and Correspondence, S.Chand &Co., New Delhi
2. R. K. Chopra, Office Organisation and Management, Himalaya Publishing House , Mumbai
3. S.P. Arora, Office Organisation and Methods, Vikas Publishing House Private Ltd.
4. Balraj Duggal, Office Management and Commercial Correspondence, Kllab Mahal
5. R.S.N.Pillai and Bagavathy, Commercial Correspondence and Office Management, Sultan Chand & Sons, New Delhi.

MSU/2016-17/UG-Colleges/Part-IV (B.Com Corporate Secretaryship)
Semester-III / Ppr.no.18 (A) / Non-Major Elective -I (A)

INTRODUCTION TO ACCOUNTANCY

Unit I: Accounting – Definition – Functions – Advantages – Limitations – Book – Keeping – Difference between Accounting and Book- Keeping – Users of Accounting Information - Accounting Principles – Concepts and Conventions – classification of Accounts – Double entry system – Merits – Rules of Debit and Credit – Accounting Equation

Unit II: Journal – Procedure of journalizing - Compound Journal Entry - Subsidiary books – Purchase book – Sales book – Purchase Return book – Sales return book – Single Column Cash book

Unit III: Ledger – Features of Ledger Accounts – Difference between Journal and Ledger – Ledger Posting – Balancing of Ledger Accounts- Preparation of Ledger Accounts

Unit IV: Trial Balance – Features – Objectives - Preparation of Trial Balance

Unit V: Final Accounts – Simple problems with Closing Stock, Outstanding and Prepaid adjustments only.

Text & Reference Books:

1. T.S.Reddy & A.Murthy, Advanced Accountancy, Margham Publications, Chennai –17
2. M.C.Shukla and T.S.Grewal, Advanced Accountancy, Sultan Chand &Co, New Delhi.
3. Dr.M.A.Arulanandam&K.S.Raman, Advanced Accountancy, Himalaya Publishing House, Mumbai.
4. S.P.Jain & K.L.Narang, Advanced Accountancy, Kalyani Publishers, New Delhi.
5. P.C.Tulsian, Accountancy, Tata McGraw, Hill edition.

**MSU/2016-17/UG-Colleges/Part-IV (B.Com Corporate Secretaryship)
Semester-III / Ppr.no.18 (B) / Non Major Elective –I (B)**

CONSUMER AWARENESS

Unit I: Meaning of consumer-Consumerism-Types of consumers (age, sex, behaviour , place of residence, income)-Objectives-Goods and services-types-evolution and growth of consumer movement in India and Tamil Nadu.

Unit II: Exploitation of consumer-Pricing, adulteration, information and labelling, duplication , artificial demand , Spurious goods , late deliveries , advertising , poor after sales service , warranty and services , fitness , not honouring terms and conditions for sale and services , financial frauds , credit card frauds and product risks.

Unit III: Consumer Rights-Meaning and sources-Six rights of the consumers under Consumer Protection Act-Right to Safety-Information-Choice, be heard, Redressal and consumer education-Consumer Responsibility.

Unit IV: Consumer protection-Meaning-Need for consumer protection-How to protect consumers-Legal measures-Consumer Protection Act 1986-Objectives-Special features of the Act-Three tier features of the Act-Three tier Redressal Agencies-District level , State level and National level. Consumer Protection (Amendment) Act 2003.

Unit V: Model form of complaints with reference to goods and services-Consumer related cases.

Text & Reference Books:

1. M.J.Antony , Consumer Rights Clarion book.
2. Shri Ram Khanna , Saivta Hanunspal Sheetal Kapoor , H.K.Awasthi, Consumer affairs, University Press .
3. R.S.N.Pillai and Bhagavathi, Modern Marketing Principles and practices, S.Chand and company.
4. S.A.Sherlekar, Marketing Management, Himalaya Publication House.
5. Mohine Setr and P.Seetharaman, Consumerism A Growing Concept, Phoenix Publishers, New Delhi.
6. Gulshan & Reddy, Consumer Protection.
7. Dr. R. Sivanesan, Consumer Awareness, Margham publications, Chennai.

MSU/2016-17/UG-Colleges/Part-III (B.Com Corporate Secretaryship)
Semester-IV / Ppr.no.19 /Core-8

ADVANCED FINANCIAL ACCOUNTING - II

Unit I: Partnership Accounts – Past adjustments and guarantee

Unit II: Admission of a Partner – Revaluation Account – Adjustment regarding goodwill – Adjustment regarding capital

Unit III: Retirement or Death of a Partner – Retirement and Admission – Death of Partner – Retiring Partner's loan – Joint life policy

Unit IV: Dissolution of partnership – Accounting Procedure – Insolvency of a partner, two partners and all partners – Garner vs. Murray rule.

Unit V: Amalgamation of firms - Sale to a company – Gradual Realisation of Assets and Piecemeal Distribution.

Text & Reference Books:

1. S.P.Jain & K.L.Narang, Advanced Accountancy volume I, Kalyani Publishers, New Delhi
2. R.L. Gupta and M. Radhaswamy, Advanced Accountancy volume I, Sultan Chand & Sons, New Delhi
3. M. Shukla and T.S. Grewal, Advanced Accountancy volume I, Sultan Chand &Co., New Delhi
4. Dr.M.A. Arulanandam & K.S.Raman, Advanced Accountancy volume I, Himalaya Publishing House , Mumbai
5. S. P. Ayyangar, Advanced Accountancy, Sultan Chand & Sons, New Delhi.
6. R.S.N.Pillai, Bagavathi & S.Uma, Fundamentals of Advanced Accounting, S.Chand & Company Ltd., New Delhi.

MSU/2016-17/UG-Colleges/Part-III (B.Com Corporate Secretaryship)
Semester-IV / Ppr.no.20/ Core-9

BUSINESS MATHEMATICS

Unit I: Number systems and equations: counting techniques- Binominal expansion numbers- natural-whole – rational – real – algebraic expression – factorization-equations – linear quadratic – solutions-simultaneous linear equations with two or three unknowns – solutions of quadratic equations - Nature of the roots – forming quadratic equation.

Unit II: Indices – definition – Positive indices – Laws of indices – Negative index – zero and unity index – Fractional index - Logarithms – Definition – Common logarithms – Theorems of logarithms – Application of common logarithm.

Unit III: Analytical geometry: Distance between two points in a plane slope of a straight line – equation of straight line – point of intersection of two lines – applications (1) demand and supply (2) cost-output (3) break-even analysis.

Unit IV: Matrix – meaning – Types – operations on matrices – scalar multiplication – addition and subtraction – Product of two matrices -Determinants – minors and co-factors – Product of two Determinants – Adjoint – inverse of matrix – solving Simultaneous Linear Equations using matrix inversion.

Unit V: Commercial arithmetic – Simple interest – Compound interest – Depreciation – Annuities – Discount – true discount – Discounting a Bill of exchange – face value of bills - Banker's discount – Banker's Gain.

Text & Reference Books:

1. D.S. Sancheti & V.K. Kapoor, Business Mathematics Sulthan Chand and Sons, New Delhi.
2. M. Manoharan & C. Elango, Business Mathematics, Palani Paramount Publications, Palani.
3. G.K. Ranganath, Text book of Business Mathematics, Himalaya Publishing House, Delhi.
4. D.C. Sanchetti & B.M. Agarwal, Business Mathematics.

MSU/2016-17/UG-Colleges/Part-III (B.Com Corporate Secretaryship)
Semester-IV / Ppr.no.21 (A) / Major Elective –I (A)

BUSINESS TAXATION

Unit I: Indirect taxes – meaning – special features – merits and demerits – difference between direct and indirect taxes – major reforms in indirect taxes in India.

Unit II : Central Excise Duty - Types of Excise duty - Valuation of goods - Clearance of goods - exemptions from excise duty - procedure for assessment and payment of Excise duty.

Unit III: Customs Act - Objectives - Levy and Collections - Types of Customs Duty - Procedure for Assessment and payment of Customs Duty - Clearance of goods - Warehousing provisions - Duty drawback provisions.

Unit IV: Service Tax- Meaning- Persons liable to pay service tax- Elements of service tax- Taxable services- Value of taxable service- Different services on which tax is payable- Service tax procedures.

Unit V: Value Added Tax (VAT) - Meaning-Objectives- Merits- Demerits- Types- VAT Rates- Dealers liable to pay VAT - Tamil Nadu VAT.
Simple problems only.

Text & Reference Books:

1. V.Balachandran, Indirect taxation.
2. T.S. Reddy and Y. Hari Prasad Reddy, Business Taxation.
3. V.S. Datey, Central Excise, Taxman Publishers.
4. R.K.Jain, Customs law manual.
5. Sanjeev Aggarwal, A Handbook of Service Tax.

MSU/2016-17/UG-Colleges/Part-IV (B.Com Corporate Secretaryship)
Semester-IV / Ppr.no.21 (B)/ Major Elective-I (B)
STOCK MARKET

Unit I: Introduction to financial market- Financial market: capital market and money market - functions of financial markets - product dealt in capital markets - importance -features of equity shares, mutual fund and derivative products. Product dealt in money market- important features of bonds, debentures, commercial paper, treasury bills - important.

Unit II: Market participants and Regulatory frame work- Registered intermediaries: brokers, sub - brokers portfolio managers, bankers to issue, merchant bankers, registrars, underwriters, portfolio managers, credit rating agencies - services rendered by the intermediaries to investors - FIIs and DIIs - ADRs and GDRs.

Unit III: Primary and secondary market- Primary market - its role and functions - principal steps involved in floating a public issue - pricing of issues fixed pricing method and book building method - mediums of secondary market- brief description of national stock exchange and Bombay stock exchange and over the counter exchange of India - listing of securities in stock exchanges - listing requirements - benefits of listing - delisting of securities.

Unit IV: Screen - based trading system and stock market index- Understanding Index numbers methodology for index construction - understanding S & PCN X NIFTY and SENSEX - concept of Risk and return of stock - systematic and non - systematic risk - diversification of risk through portfolio of stock.

Unit V: Depositories Dematerialization of securities - Benefits of Dematerializing - Depositories - need for establishment of depositories - role played by depositories - depository participants - opening account - with depositories - objectives of depository Act 1996.

Text & References Books:

1. Bhole, L.M Financial Institutions and Markets- III Ed, Tata McGraw, Hill Publishing Company.
2. National Stock Exchange of India, Mumbai. website www.nseindia.com

**MSU/2016-17/UG-Colleges/Part-IV(B.Com Corporate Secretaryship)
Semester-IV / Ppr.no.21 (C) / Major Elective-I (C)**

INVESTMENT MANAGEMENT

Unit I: Investment - nature and scope of investment analysis - elements of investments - return, risk and time - time elements - objectives of investment - security, return and risk analysis - measurements of return and risk - approaches to investment analysis.

Unit II: Types of investments - financial investment - securities and derivatives, deposits, tax sheltered investments - non financial investments - real estate, gold and other types and their characteristics - sources of financial information.

Unit III: Fundamental analysis - economic analysis - industrial analysis and company analysis - technical analysis - various prices and volume indicators, indices and moving averages, interpretation of various types of trends and indices.

Unit IV: Valuation of securities - fixed income securities, bonds, debentures, preference shares and convertible securities - variable income securities - equity shares.

Unit V: Investment by individuals - investments policies of individuals - Tax saving schemes in India.

Text & Reference Books:

1. James Fransis, Investment Analysis and Management, Clark, Tata McGraw-Hill Co, New Delhi.
2. J. Fabozzi, Frank, Investment Management, Prentice Hall, New Delhi.
3. S. Kevin, Portfolio Management, Prentice Hall, New Delhi.
4. Investment Management, Margham publications.

**MSU/2016-17/UG-Colleges/Part-IV(B.Com Corporate Secretaryship)
Semester-IV / Ppr.no.21 (D) /Major Elective- I (D)**

OFFICE AUTOMATION

Unit- I: Introduction to office: Introduction to office 2000 – opening and closing office programs- Microsoft office – Short cut keys- tool bars- Customising Office Application- Files and folders- Configuration printers- Installation Programs.

Unit- II: MS-Word: Creating a document – Copying and moving text- Formatting the document (Font, Paragraph, Bullets and Numbering, Page setup). Inserting page breaks - Page numbers- Margin- Application of Header and Footer. Creating Tables - Entering Text- Formatting Table – Using Formulas- Mail merge – Letter – Label – Envelope.

Unit- III: MS-Excel: Introduction to electronic spread sheet – Excel 2000- Basics creating and saving a work book- entering data into worksheet within (manual- Automatic) – basic formatting – Basic Excel function – Chart (various Types)

Unit-IV: MS- Power Point: Create a new presentation using Blank Presentation- Formatting text and applying designs and back ground of slide. Create a new presentation using Templates – Apply Custom animation, Slide Transition, Sound effect – View show. Create a new presentation using Auto content Wizard.

Unit- V: MS- Access and Tables: Creating a New Blank data bases- Creating Table – Field size- Caption- Data types – Indexed Unicode- Compression – Decimal Places, Modifying Tables – Modifying Field Property.

Text & Reference Books:

1. Vikas Gupta, Comtex Computer Course Kit (XP) Edition), Dreamtech publish, Delhi.
2. Alexis Leon, Mathews Leon, Chitra, Jeyari, Fundamentals of computing C Programming and MS office, Vijay Nicole Private Limited.
3. OFFICE AUTOMATION- PRACTICAL.
4. Office Management, Margham Publications.

**MSU/2016-17/UG-Colleges/Part-III(B.Com Corporate Secretaryship) /
Semester-IV/ Practical**

Practical

MS Word

a. Text Manipulation

Changing the font size and type
Aligning and justification of text
Underlining the text
Indenting text

- i. Prepare the Bio-data
- ii. Prepare a Letter

b. Usage of numbering, bullets, footer and headers

- i. Prepare a document and Auto formation
- ii. Prepare a document with built, footers and headers

c. Tables and Manipulations

- i. Create a Calendar and auto format
- ii. Create a mark sheet-using table
- iii. Picture insertion and alignment

d. Mail Merge Application

M.S. Excel

- i. Creating and serving Excel sheet
- ii. Usage formulas and build-in functions
- iii. Describe the types of function
- iv. Data sorting
- v. Mark sheet preparation
- vi. Inserting chart

M.S Power point

- i. Creating and saving Presentation
- ii. Prepare a presentation of your own

M.S Access

- i. Creating database of your own
- ii. Modify table content in data base

MSU/2016-17/UG-Colleges/Part-III (B.Com Corporate Secretaryship)
Semester-IV / Ppr.no.22/Allied - IV

CORPORATE FINANCE

Unit I: Corporate Finance - Definition- Scope and importance- Finance function - classification and description of finance function

Unit II: Capital structure – Financial and operating leverage- Long term and Short term capital.

Unit III: Capitalization – Over capitalization – Under capitalization –Capital gearing –Lease financing – types, importance and limitation.

Unit IV: Working capital management – Determination of working capital –importance – financing of working capital management – receivable –inventories and cash management.

Unit V: Financial markets – money markets –capital markets –recent trends in capital markets- mutual funds-factoring – forfeiting- depositories.

Text & Reference Books:

1. Kulkarni – Corporate finance
2. Vasant Deshi- Indian financial system
3. I.M.Pondey –Financial management
4. S.M. Maheswari – Corporate finance

MSU/2016-17/UG-Colleges/Part-IV (B.Com Corporate Secretaryship)
Semester-IV / Ppr.no.23(A)/ Skill Based-II (A)

BUSINESS MODELS

Unit I : Meaning of Business – Entrepreneur (Meaning, Characteristics of an entrepreneur)- Enterprise- a business venture- Business idea and opportunity- Examining some business ideas in agriculture, agro-based enterprises, general trade (including shops), manufacturing products and services (including hotels) and their unique features by incorporating outsourcing.

Unit II : Preparing a Business Plan – Retail selling grocery shop; a textiles selling shop; any other consumer goods selling business; a small scale manufacturing unit –Printing Press-Electrical and Electronic goods dealership. Contract works as business - Estimating the returns or profits- Preparing a conceptual and graphic model.

Unit III: Financing model for a business: Sources for a small business- owned capital, friends and relatives; banks; government sources; suppliers and customers; interest and other costs and the terms and conditions attached to such sources and investing the finance in assets-The working capital cycle- Illustrating the problems involved therein.

Unit IV: Marketing and Selling models- Advertising and soliciting customers, customer relationship; Quality assurance; Pricing Methods; Competition and strategies in facing the competition.

Unit V: Models for managing the human resources in the business- recruitment, training, employee productivity and compensation; Building up organizational procedures and commitment, loyalty. (To be explained in general and in terms of the types of businesses taught in the earlier Units)

Text & Reference Books:

1. Rashmi Bansal, Take Me Home: The Inspiring Stories of 20 Entrepreneurs. Westlands, 2014.
2. Peter F.Drucker, Innovative Entrepreneurship, Harper Business, Reprint Ed. 2006.
3. Peter Theil, Zero to One: Note on Start- ups or How to build the future, Crown Business, 2014.
4. Sangram Keshari Mohanty, Fundamentals of Entrepreneurship, (PB) PHI, 2005.
5. Alexander Osterwandler, Business Model Generation, Crown Business, 2014.

**MSU/2016-17/UG-Colleges/Part-IV(B.Com Corporate Secretaryship)
Semester-IV / Ppr.no.23(B)/ Skill Based – II (B)**

CAREER PLANNING

Unit I: Career Planning-Meaning-How to get Employment-(Jobs through competitive examinations , Employment Exchanges , Advertisements and applications , contracts , vocational guidance Bureaus)-Main sources of information-Commerce graduates and careers.

Unit II: Speaking skills-Essentials of a good speech-Content of a speech- Qualities of a good speaker-Self introduction-Giving speech on a general topic-Group discussion-Meaning-Features of Group discussion-Requirement for effective group discussion-How to participate in Group discussion ?-Role of Group leader-Model of group discussion(class room practice)-Report Writing-Meaning of Report-Importance-Types-Features of a good report-Steps in preparing a general report.

Unit III: Interview-Meaning-Types-Significance-Interview techniques-Preparing before interview-How to participate in an interview-Model Interview (class room practice)-General Awareness preparation.

Unit IV: Test of Numerical Ability (simple questions)-Simplification-Percentage-Profit and loss-Ratio and proportion-Time and work-Time and distance-Calendar-Clock problems.

Unit V: Test of Reasoning Ability (verbal only)-Analogy-Odd man out, coding and decoding-Direction sense test-Position and order-Alphabet test-Blood Relation-Commonsense test-Puzzle test.

Text & Reference Books:

1. Dr Shuba Mitter and S.C.Agarwal Guide to careers for commerce graduates.
2. Prakhsh.J.Shaw, How to develop your personality.
3. Bevosh Bhiskshu, Steps to success.
- 4.Kochar.S.K, Educational and vocational Guidance in colleges and universities.
5. Mohan.K.Mani Ram Agarwal, General Knowledge Digest.
6. Arokian.J.B, Career counselling.
7. Agarwal.R.S, Mordern Approach to verbal Reasoning.
8. Agarwal.R.S, Quatitative Aptitude.

MSU/2016-17/UG-Colleges/Part-IV (B.Com Corporate Secretaryship)
Semester-IV / Ppr.no.23(C)/ Skill Based-II (C)

ENTREPRENEURSHIP DEVELOPMENT

Unit I: Entrepreneurship – meaning – definition – importance – Entrepreneur – types of entrepreneurs – functions of entrepreneurs – qualities of entrepreneurs – entrepreneur as a career – role of entrepreneur in economic development.

Unit II: Factors affecting entrepreneurial growth – economic – social cultural –psychological and sociological factor – women entrepreneurship – functions and problems of women entrepreneurs

Unit III: MSME – definition – overview of MSME in India – Government policies & support measures – schemes and incentives – problems and prospects of MSME in India – entrepreneurship development programmes.

Unit IV: Industrial finance to entrepreneurs – TIIC, SIDBI and commercial banks. Institutional support to entrepreneurs – EDII – NAYE- KVIC- DIC and industrial estates.

Unit V: Project report – meaning and importance – contents of project report – project appraisal – market feasibility – technical feasibility – financial feasibility and economic feasibility.

Text & Reference Books:

1. Robert D Hisrich, Michael P Peters & Dean A Shephard, Entrepreneurship, TataMcgraw Hill Co.
2. N.P. Srinivasan, Entrepreneurship Development, Sultan Chand & Sons.
3. P. Saravanavel, Entrepreneurship Development, Esspeekay Publishing House.
4. S.S. Khanka, Entrepreneurial Development, S. Chand & Sons.

**MSU/2016-17/UG-Colleges/Part-IV (B.Com Corporate Secretaryship)
Semester-IV / Ppr.no.24(A)/ Non-Major Elective –II (A)**

FINANCIAL ACCOUNTING

Unit I: Average Due Date

Unit II: Bank Reconciliation Statement – Meaning causes of difference between balance as per cash book and pass book – Need of Bank Reconciliation Statement – Preparation of Bank Reconciliation Statement

Unit III: Self balancing Ledger – Sectional balancing system

Unit IV: Depreciation – Meaning – Causes – Straight Line method and Written down value method – Simple problems only

Unit V: Rectification of Errors (Simple problems only).

Text & Reference Books:

1. T.S.Reddy & A.Murthy, Advanced Accountancy, Margham Publications, Chennai-17.
2. M.C.Shukla and T.S.Grewal, Advanced Accountancy, Sultan Chand &Co, New Delhi.
3. Dr.M.A.Arulanandam&K.S.Raman, Advanced Accountancy, Himalaya Publishing House, Mumbai.
4. S.P.Jain & K.L.Narang, Advanced Accountancy -- Kalyani Publishers, New Delhi.
5. P.C.Tulsian, Accountancy –Tata McGraw – Hill edition.
6. R.S.N.Pillai, Bagavathi & S.Uma, Fundamentals of Advanced Accounting, S.Chand & Company Ltd., New Delhi.

MSU/2016-17/UG-Colleges/Part-IV (B.Com Corporate Secretaryship)
Semester-IV // Ppr.no.24 (B)/ Non-Major Elective– II (B)

HUMAN RIGHTS

Unit I: Meaning - Definition of Human Rights - Characteristics of human rights - kinds of Human Rights - Civil and political – social, economic and cultural rights

Unit II: Violation of human rights - Patterns of violations and abuses - Action against violation of human rights as per Indian law

Unit III: Rights of the Disabled Persons - Declaration on the rights of disabled persons 1975 - International year of disabled persons 1981

Unit IV: Bonded labour - Concepts and definitions - Constitutional and legal provisions - Salient features of bonded labour system (abolition) Act 1976 - Role of the national human rights commission

Unit V: Minorities Rights commission & its functions - Definitions - National commission for minorities - Functions of the commissions

Text & Reference Books:

1. Paras Diwan, Peerushi Dewan , Human Rights and Law.
2. Dr. Giriraj Shah, IPS & K.N. Gupta, IPS, Human Rights.
3. Jagannath Mohany , Teaching of Human Rights.
4. C. Nirmala Devi, Human Rights
5. Praveen Vadkar, Concepts, Theories and Practice of Human Rights, Neha Publishers
6. Baradat Sergio and Swaranjali Ghosh, Teaching of Human Rights, Dominant Publishers and Distributors, New Delhi, 2009.
7. Roy.A.N. Human Rights Tasks, Duties and Functions: Aavishakar Publications and Distributors, Jaipur.
8. Asish Kumar Das and Prasant Kumar Mohanty, Human Rights in India: Sarup and sons, New Delhi, 2000

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

B.Com with Computer Applications

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(45th SCAA meeting held on 09.02.2017)

Sem.	Pt. I / II/ III/ IV/V	Subject Status	Subject Title	Hrs. per week	Cre- dits	Marks				
						Maximum			Passing minimum	
						Int.	Ext.	Tot.	Ext.	Tot.
III	III	Core - 5	ADVANCED FINANCIAL ACCOUNTING - I	6	4	25	75	100	30	40
	III	Core - 6	BUSINESS STATISTICS	6	4	25	75	100	30	40
	III	Core -7	BANKING	6	4	25	75	100	30	40
	III	Allied - III	*COREL DRAW (Theo.- 4 hrs, Pra.- 2 hrs)	6	5	50@	50@	100	20	40
	IV	Skill Based -I (Any One)	(A). COMPUTER APPLICATIONS IN BUSINESS (B) . INTERNET WITH WEB DESIGNING	4	4	25	75	100	30	40
	IV	Non- Major –I (Any One)	(A). INTRODUCTION TO ACCOUNTANCY BASED ON TALLY (B).FUNDAMENTALS OF COMPUTER TECHNOLOGY	2	2	25	75	100	30	40
	SUBTOTAL				30	23				

*** Internal 25 marks for Theory and External 75 marks for Practical**

@: Award of marks for practical component is as per the 45th SCAA resolution [no.: 45.7.2.1(45.T4) –refer www.msuniv.ac.in]

Sem.	Pt. I / II/ III/ IV/V	Subject Status	Subject Title	Hrs per week	Cre- dits	Marks				
						Maximum			Passing minimum	
						Int.	Ext.	Tot.	Ext.	Tot.
IV	III	Core - 8	ADVANCED FINANCIAL ACCOUNTING - II	6	4	25	75	100	30	40
	III	Core - 9	BUSINESS MATHEMATICS	6	4	25	75	100	30	40
	III	Major Elective – I (Any One)	(A).MARKETING	6	5	25	75	100	30	40
			(B). BUSINESS TAXATION							
			(C). INVESTMENT MANAGEMENT							
	III	Allied - IV	*INTRODUCTION TO INTERNET AND HTML (Theo.– 4 hrs, Pra.– 2hrs)	6	5	50@	50@	100	20	40
	IV	Skill Based –II (Any One)	(A). INTRODUCTION TO DATABASE MANAGEMENT SYSTEM	4	4	25	75	100	30	40
			(B). MANAGEMENT INFORMATION SYSTEM							
	IV	Non-Major Elective –II (Any One)	(A). INTRODUCTION TO COMPUTER ARCHITECTURE	2	2	25	75	100	30	40
			(B). HUMAN RIGHTS							
V	Extension Activity	NSS/NCC/YRC/YWF	-	1	-	-	-	-	-	
SUBTOTAL				30	25					

*** Internal 25 marks for Theory and External 75 marks for Practical**

@: Award of marks for practical component is as per the 45th SCAA resolution [no.: 45.7.2.1(45.T4) –refer www.msuniv.ac.in]

MSU/2016-17/UG-Colleges/Part-III (B.Com with Computer Applications)

Semester-III / Ppr.no.13/ Core-5

ADVANCED FINANCIAL ACCOUNTING - I

Unit I: Branch Accounting – Debtor’s system – Invoice price Method (excluding stock and Debtor’s system) – Departmental Accounts – Departmental Trading and Profit and Loss Accounts – Departmental Transfers.

Unit II: Contract Account – Completed contracts and incomplete contracts – Farm Accounting.

Unit III: Hire purchase and Instalment system – Calculation of Cash price and interest – Default and Repossession – Difference between Hire purchase and Instalment system.

Unit IV: Royalty Account – Meaning – Minimum rent – Short working – Type of recoupment - strike and lock out.

Unit V: Insolvency accounts – Insolvency of an individual – Statement of Affairs – Deficiency Account.

Text & Reference Books:

1. Dr.M.A. Arulanandam & K.S.Raman, Advanced Accountancy, Himalaya Publishing House , Mumbai
2. R.L. Gupta and M. Radhaswamy, Advanced Accountancy, Sultan Chand & Sons, New Delhi
3. M. Shukla and T.S. Grewal, Advanced Accountancy, S.Chand &Co., New Delhi
4. S.P.Jain & K.L.Narang, Advanced Accountancy, Kalyani Publishers, New Delhi.
5. T.S.Reddy & A.Murthy, Advanced Accountancy, Margham Publications, Chennai.
6. R.S.N.Pillai, Bagavathi & S.Uma, Fundamentals of Advanced Accounting, S.Chand & Company Ltd., New Delhi.

MSU/2016-17/UG-Colleges/Part-III (B.Com with Computer Applications)
Semester-III / Ppr.no.14/ Core-6

BUSINESS STATISTICS

Unit I: Definition of statistics – Importance – Application – Limitations - Statistical survey – Planning and design of survey – Collection of Data – Sources - primary and secondary data – Techniques – Census method and sampling method - Sampling design –Methods of sampling- Classification of data – Tabulation –Diagrammatic and graphic presentation of data .

Unit II: Measures of Central Tendency – Mean – Median – Mode – Geometric Mean -Harmonic Mean.

Unit III: Measures of Dispersion-Range – Quartile Deviation – Mean Deviation - Standard Deviation – Co-efficient of Variation. Skewness - methods of studying Skewness - Karl Pearson's Co-efficient of Skewness – Bowley's co-efficient of Skewness.

Unit IV: Correlation – meaning – types-scatter diagram – Karl Pearson's Co-efficient of Correlation- Rank correlation – Con-current deviation method. Regression analysis – uses- Regression line – Regression equations – least square method - deviations taken from actual mean and assumed mean method.

Unit V: Index numbers – meaning – types – its problems – Methods of constructing index numbers – un- weighted and weighted indices – Index number tests – Consumer price index numbers. Analysis of time series – Meaning – Importance – Components of time series – Secular trend, seasonal, cyclical and irregular variations – Measurement of trend - Graphic method – Moving average method – Method of least square.

Text & Reference Books:

1. Dr. S.P. Gupta, Statistical Method, Sultan Chand & Sons, New Delhi.
2. Dr. M. Manoharan, Statistical Methods, Palani Paramount Publications, Palani.
3. R.S.N. Pillai & Bhagavathi, Statistics-Theory and Practice, S.S. Chand & Co.
4. M. Wilson, Business Statistics, Himalaya Publishing House, Mumbai.

MSU/2016-17/UG-Colleges/Part-III (B.Com with Computer Applications)
Semester-III / Ppr.no.15/ Core-7

BANKING

Unit I: Banker and Customer : Relationship between banker and customer – General & Special relationship – Rights of the banker – Negotiable instruments – Promissory note, Bill of exchange & Cheque (Meaning & Features) – Proper Drawing of the cheque – Crossing (Definition & Types) – Endorsement (Definition & Kinds) – Material alteration – Statutory protection to the paying banker – Statutory protection to the collecting banker

Unit II: Banking System: Indigenous Bankers – Commercial Banks – Co-Operative Banks – Land development Banks – Industrial Development Banks - NABARD- EXIM Banks – Foreign Exchange Banks.

Unit III: Traditional Banking: Receiving Deposits – General Precaution – Kinds of deposits – Fixed – Current – Saving – Recurring & Others Lending Loans & Advances – Principles of sound lending – forms of advances – loan , cash credit , over draft & bills purchase & discounted. Mode of charging security – lien , pledge , mortgage , assignment & hypothecation.

Unit IV: Modernised Banking : Core banking – Home banking – Retail banking – Internet banking – Online banking and Offline banking – Mobile banking –Electronic Funds Transfer – ATM and Debit Card – Smart Card – Credit Card – E-Cash – Swift – RTGS.

Unit V: Reserve Bank of India : Functions of Reserve Bank of India – Methods of Credit Control – RBI'S Monetary policy – Opening New Branches – New Licence in Policy.

Text & Reference Books:

1. K.C.Sherlekar - Banking theory law and practice.
2. S.N.Lal - Banking theory law and practice.
3. M.C.Tannen - Banking theory law and practice.
4. E.Gordon and K.Natarajan - Banking theory law and practice.
5. S.S.Gulshan and Gulshan K.Kapoor - Banking theory law and practice.
6. S. Guruswamy – Banking Theory Law & Practice –3rd Edition, Vijay Nicole Imprints Private Limited, Chennai.

MSU/2016-17/UG-Colleges/Part-III (B.Com with Computer Applications)
Semester-III / Ppr.no.16/Allied - III
COREL DRAW

Unit I: Introduction: Introduction to CorelDraw: Customize the workspace, Difference between raster and Vector graph. Creating Graphical object: Set up a drawing page, draw various shapes and lines include objects and add text to the objects, object selection techniques.

Unit II: Objects Formation And Manipulation of Text: Formatting Objects: Working with files, creating objects, modifying objects, outlines and align objects and Object tools. Manipulation of Text: Fit text on path, work with paragraph text, wrapping paragraph text, work with text, insert special character, spell check documents. Working with Tables: Create and modify tables, Formation of tables.

Unit III: Enhancements of Drawing And Design: Enhancing a Drawing: Apply Artistic Media tool effects to various objects, creating symbols. Working with page: Understanding page elements, create Layers. Color: Creating and setting guidelines color. Create Design: Create Shapes, custom Shapes.

Unit IV: Manipulation of Drawing and Images: Manipulating a Drawing: Format object and Edit objects. Working with images: Enhance image, Conversion of Bit map image to vector image, Zooming and viewing images.

Unit V: Essential Elements of Interface: Developing interface Elements and Task: Hyper link text, working with file convertor Macro, print merge documents, prepare for distribution: Finalizing a documents, Output a documents. Lock and Un Lock object.

Text & Reference Books:

1. Kogent Solutions Inc. Corel draw X4 and X7 in Simple Steps Paperback – 2008
2. Dinesh Maidasani , Corel draw X3 (Straight to the Point) 2007
Gary David Bouton, Corel DRAW X7 Paperback – 2015
3. Bangia R, Learning Corel draw X5 PB Paperback – 2011
4. Kogent Solutions Inc., Corel draw X4 in Simple Steps Paperback – 2008

*** Internal 25 marks for Theory and External 75 marks for Practical**

MSU/2016-17/UG-Colleges/Part-III (B.Com with Computer Applications)
Semester-III / Ppr.no.16/Allied Practical

COREL DRAW - PRACTICAL

1. Develop CorelDraw application to draw a pie or arc shape.
2. Develop CorelDraw application to creating a seasonal greetings card.
3. Develop CorelDraw application to Preparing documents for printing
4. Develop CorelDraw application to open and create a student data sheet.
5. Develop CorelDraw application to Edit Text and Basic Shapes.
6. Develop CorelDraw application Add Text to object.
7. Develop CorelDraw application to draw straight line.
8. Develop CorelDraw application to Create and Use Perfect Shapes.
9. Develop CorelDraw application to draw a polygon shapes.
10. Develop CorelDraw application of Working with text style in your documents
11. Develop CorelDraw application to Applying Spell check to your documents
12. Develop CorelDraw application Working with paragraph text

Record note	: 15 marks,
Programme Writing	: 15×2=30 marks,
Debugging	: 10×2=20 marks,
Result	: 5×2=10 marks.

**MSU/2016-17/UG-Colleges/Part-III (B.Com with Computer Applications)
Semester-III / Ppr.no.17 (A)/ Skill Based - I (A)**

COMPUTER APPLICATIONS IN BUSINESS

Unit I: Introduction to Computers: Meaning of computers- Characteristics of computer – Areas of Computer Applications- Input Process and output (I-P-O) Cycle – Components of computer- Hardware and Software- Operating Systems – Windows.

Unit II: Overview of E-Commerce and E-Business – Potential benefits of E-commerce, Limitations - Impact of E-commerce on Business Models. E- Commerce applications: Entertainment, E- Marketing, E- Advertising, Mobile Commerce, Online trading, E-learning, E-Shopping.

Unit III: Consumer oriented E-Commerce Applications: Mercantile Press Model: Consumers Prospective and Merchant's Prospective. Electronic Payment Systems: Advantages and Risk, Types of Payment system (Credit cards, E- Cash, Smart Cards)

Unit IV: Electronic Data Interchange: Non- EDI system, Partial EDI System- Fully Integrated EDI System- Pre-requisite for EDI. Issue of EDI: Legal issue, Security issue, Privacy issue.

Unit V: E- Marketing techniques: Search engines, Directories, Registrations, Solicited targeted E-mails, Interactive sites, Banners, Advertising, Spam Mails, E-mail, Chain letters. Applications of 5 P's (Product Price, Price, Place, Promotion, People) E- Advertising Techniques: Banners, Sponsorships, Portals and online coupons.

Text &Reference Books:

1. E- commerce: A Managerial Perspective Micheal change, etc A1
2. Electronic Commerce – Security: Greenstein & Feinman Risk Management & Control.
3. Ravi Kala Kota & A.B. Whinston: Frontiers of Electronic Commerce
4. Introduction to Computer Science – IITL Education Solutions ltd.
5. Dr.K.Abirami Devi, Dr.M. Alagammai, E- Commerce, Margham Publications, Chennai- 600017, 2009.

**MSU/2016-17/UG-Colleges/Part-III (B.Com with Computer Applications)
Semester-III / Ppr.no.17 (B) /Skill Based – I (B)**

INTERNET WITH WEB DESIGNING

Unit I: Introduction To Internet: Internet- Introduction to networks and internet, history, working of Internet, Modes of connecting to internet, ISPs, Internet address, standard address, domain name, Modems . World Wide Web Introduction, search fundamentals, working of the search engines, FTP, Internet Service Providers, Types of Connectivity

Unit II: HTML CSS And Java Script: HTML – Introduction, SGML, DTD(Document Type Definition, Basic Html Elements, Tags and usages, HTML Standards.: Introduction Cascading Style Sheets: Syntax ,Class Selector, Id Selector Document Object Model & Data Source Object. Java Script – Variables-Constant – Expressions, Conditions- Relational Operators- Data Types – Flow Control –Function.

Unit III: XML: What is XML – Basic Standards, Schema Standards, Linking & Presentation Standards, Standards that build on XML, Generating XML data, Writing a simple XML File, Creating a Document type definition, Documents & Data, Defining Attributes & Entities in the DTD, Designing an XML data structure.

Unit IV: Internet Security & Firewalls: Types Of Viruses, Client Server Security Threats, Data & Message Security, Various electronic payment systems. Firewalls: Introduction to Firewalls, Concept of Firewalls, Application Gateways, AAA (Authentication , Authorization And Accounting).

Unit V: Website Planning & Hosting: Introduction, Web Page Lay-Outing, Where To Host Site, Maintenance Of Site, Registration Of Site On Search Engines And Indexes, Introduction To File Transfer Protocol, Public Domain Software, Types Of FTP Servers.

Text & Reference Books:

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006.
2. Robert. W. Sebesta, "Programming the World Wide Web", Fourth Edition, Pearson Education, 2007.
3. Deitel, Deitel, Goldberg, "Internet & World Wide Web How To Program", Third Edition, Pearson Education, 2006.
4. Marty Hall and Larry Brown,"Core Web Programming" Second Edition, Volume I and II, Pearson Education, 2001.
5. Bates, "Developing Web Applications", Wiley, 2006.

**MSU/2016-17/UG-Colleges/Part-IV (B.Com with Computer Applications)
Semester-III / Ppr.no.18 (A)/ Non-Major Elective –I (A)**

INTRODUCTION TO ACCOUNTANCY BASED ON TALLY

Unit I: Definition of Accounting- Accounting concepts-Journal –

Unit II: Preparation of ledger Accounts-

Unit III: Subsidiary books- Purchase, Sales, Purchase return, Sales return, Cash book

Unit IV: Tally-Features of Tally- Company creation, Groups and Ledger creation

Unit V: Voucher –Types, Creation. Display of Trial balance and Balance sheet.

Text & Reference Books:

1. T.S Reddy & A.Murthy, Advanced Accountancy , Volume I , Margham Publications, Chennai
2. M.C. Sukula & T.S Grewal , Advanced Accountancy, S. Chand & Co, New Delhi
3. Advanced Accountancy – By - Himalaya Publishing House, Mumbai
4. M.A. Arulanandam & K.S Raman, Using Tally ERP 9, Ramesh.Bangia, Khanna Book Publishing Ltd.2010
5. Asok K. Nadhani, Mastering Tally ERP 9, BPB Publication.
6. Tally ERP 9 Training Guide, Kitabmahal.

MSU/2016-17/UG-Colleges/Part-IV (B.Com with Computer Applications)
Semester-III / Ppr.no.18 (B) Non-Major Elective – I (B)

FUNDAMENTALS OF COMPUTER TECHNOLOGY

Unit I: Introduction to Computers: Introduction – Characteristics of Computers – Evolution of Computers - Computer Generations – Classification of Computers – Basic Computer organization – Number Systems

Unit II: Computer Software: Computer Software –Types of Software – Software Development Steps – Internet Evolution - Basic Internet Terminology.

Unit III: Programming Basics And Memory: Algorithm – Flow Charts – Pseudo code - Application Software Packages- Introduction to Memory: Primary and Secondary.

Unit IV: Basic Computer Network: Introduction to Computer Network - Types of Network – Network topology - Bridges – Gateway – switches – Routers.

Unit V: Basic Operating System: Introduction to Operating system services – Types of operating system – characteristics of operating system – security.

Text & Reference Books:

1. Raja Raman V., "Fundamental of Computers" (6th edition.), Prentice Hall of India, New Delhi.
2. Trainer T., et al, "Computers", McGraw Hill.
3. Norton, Peter, "Introduction to Computers, Mc-Graw-Hill.
4. B. Ram, "Computer Fundamentals", New Age International Pvt. Ltd.

MSU/2016-17/UG-Colleges/Part-III (B.Com with Computer Applications)
Semester-IV / Ppr.no.19/ Core-8

ADVANCED FINANCIAL ACCOUNTING - II

Unit I: Partnership Accounts – Past adjustments and guarantee

Unit II: Admission of a Partner – Revaluation Account – Adjustment regarding goodwill – Adjustment regarding capital

Unit III: Retirement or Death of a Partner – Retirement and Admission – Death of Partner – Retiring Partner's loan – Joint life policy

Unit IV: Dissolution of partnership – Accounting Procedure – Insolvency of a partner, two partners and all partners – Garner vs. Murray rule.

Unit V: Amalgamation of firms - Sale to a company – Gradual Realisation of Assets and Piecemeal Distribution.

Text & Reference Books:

1. S.P.Jain & K.L.Narang, Advanced Accountancy volume I, Kalyani Publishers, New Delhi
2. R.L. Gupta and M. Radhaswamy, Advanced Accountancy volume I, Sultan Chand & Sons, New Delhi
3. M. Shukla and T.S. Grewal, Advanced Accountancy volume I, Sultan Chand & Co., New Delhi
4. Dr.M.A. Arulanandam & K.S.Raman, Advanced Accountancy volume I, Himalaya Publishing House, Mumbai
5. S. P. Ayyangar, Advanced Accountancy, Sultan Chand & Sons, New Delhi.
6. R.S.N.Pillai, Bagavathi & S.Uma, Fundamentals of Advanced Accounting, S.Chand & Company Ltd., New Delhi.

MSU/2016-17/UG-Colleges/Part-III (B.Com with Computer Applications)
Semester-IV / Ppr.no.20 / Core-9

BUSINESS MATHEMATICS

Unit I: Number systems and equations: counting techniques- Binominal expansion numbers-natural-whole – rational – real – algebraic expression – factorization-equations – linear quadratic – solutions-simultaneous linear equations with two or three unknowns – solutions of quadratic equations - Nature of the roots – forming quadratic equation.

Unit II: Indices – definition – Positive indices – Laws of indices – Negative index – zero and unity index – Fractional index - Logarithms – Definition – Common logarithms – Theorems of logarithms – Application of common logarithm.

Unit III: Analytical geometry: Distance between two points in a plane slope of a straight line – equation of straight line – point of intersection of two lines – applications (1) demand and supply (2) cost-output (3) break-even analysis.

Unit IV: Matrix – meaning – Types – operations on matrices – scalar multiplication – addition and subtraction – Product of two matrices -Determinants – minors and co-factors – Product of two Determinants – Adjoint – inverse of matrix – solving Simultaneous Linear Equations using matrix inversion.

Unit V: Commercial arithmetic – Simple interest – Compound interest – Depreciation – Annuities – Discount – true discount – Discounting a Bill of exchange – face value of bills - Banker's discount – Banker's Gain.

Text & Reference Books:

1. D.S. Sancheti & V.K. Kapoor, Business mathematics Sulthan Chand and sons New Delhi.
2. M. Manoharan & C. Elango, Business Mathematics, Palani Paramount Publications, Palani.
3. G.K. Ranganath, Text book of Business Mathematics, Himalaya Publishing House, Delhi.
4. D.C. Sanchetti & B.M. Agarwal, Business Mathematics.

**MSU/2016-17/UG-Colleges/Part-III (B.Com with Computer Applications)
Semester-IV / Ppr.no.21(A) / Major Elective- I (A)**

MARKETING

Unit I: Marketing – Definition – Objectives – Micro and Macro marketing – Modern marketing concept – Marketing in economics development.

Unit II: Functions of marketing – Marketing mix – Market segmentation – Market targeting and positioning.

Unit III: Product Planning – Development – Product line – Product Mix strategies – Product life cycle –Diversification – Elimination - Pricing Strategies.

Unit IV: Marketing of consumer goods – Channels of distribution – Types of channels – Recent trends in marketing – Online marketing – Tele – Marketing – Service marketing.

Unit V: International marketing – Importance – Objectives – Policies – Import and Export marketing – Prohibited imports and exports – Coping with global competition – Export – Import scene in India.

Text & Reference Books:

1. R.S.N Pillai & Bhagavathi, Modern Marketing, Principles & Practices, S. Chand & Co. Ltd., New Delhi.
2. Philip Kotler, Marketing Management Practice, Hall of India Pvt Ltd., New Delhi.
3. William G. Zikmund & Michael d' Amico, Marketing, West Publishing Company.

MSU/2016-17/UG-Colleges/Part-III (B.Com with Computer Applications)
Semester-IV / Ppr.no.21(B) / Major Elective- I (B)

BUSINESS TAXATION

Unit I: Indirect taxes – meaning – special features – merits and demerits – difference between direct and indirect taxes – major reforms in indirect taxes in India.

Unit II : Central Excise Duty - Types of Excise duty - Valuation of goods - Clearance of goods - exemptions from excise duty - procedure for assessment and payment of Excise duty.

Unit III: Customs Act - Objectives - Levy and Collections - Types of Customs Duty - Procedure for Assessment and payment of Customs Duty - Clearance of goods - Warehousing provisions - Duty drawback provisions.

Unit IV: Service Tax- Meaning- Persons liable to pay service tax- Elements of service tax- Taxable services- Value of taxable service- Different services on which tax is payable- Service tax procedures.

Unit V: Value Added Tax (VAT) - Meaning-Objectives- Merits- Demerits- Types- VAT Rates- Dealers liable to pay VAT - Tamil Nadu VAT.
Simple problems only.

Text & Reference Books:

1. V.Balachandran, Indirect taxation.
2. T.S. Reddy and Y. Hari Prasad Reddy, Business Taxation.
3. V.S. Datey, Central Excise, Taxman Publishers.
4. R.K.Jain, Customs law manual.
5. Sanjeev Aggarwal, A Handbook of Service Tax.

MSU/2016-17/UG-Colleges/Part-III (B.Com with Computer Applications)
Semester-IV / Ppr.no.21 (C)/ Major Elective-I (C)

INVESTMENT MANAGEMENT

Unit I: Investment - nature and scope of investment analysis - elements of investments - return, risk and time - time elements - objectives of investment - security, return and risk analysis - measurements of return and risk - approaches to investment analysis.

Unit II: Types of investments - financial investment - securities and derivatives, deposits, tax sheltered investments - non financial investments - real estate, gold and other types and their characteristics - sources of financial information.

Unit III: Fundamental analysis - economic analysis - industrial analysis and company analysis - technical analysis - various prices and volume indicators, indices and moving averages, interpretation of various types of trends and indices.

Unit IV: Valuation of securities - fixed income securities, bonds, debentures, preference shares and convertible securities - variable income securities - equity shares.

Unit V: Investment by individuals - investments policies of individuals - Tax saving schemes in India.

Text & Reference Books:

1. James Fransis, Investment Analysis and Management, Clark, Tata McGraw-Hill Co, New Delhi.
2. J. Fabozzi, Frank, Investment Management, Prentice Hall, New Delhi.
3. S. Kevin, Portfolio Management, Prentice Hall, New Delhi.
4. Investment Management, Margham publications.

MSU/2016-17/UG-Colleges/Part-IV (B.Com with Computer Applications)
Semester-IV / Ppr.no.22/Allied - IV

INTRODUCTION TO INTERNET AND HTML

Unit I: Introduction To Internet: Introduction, Evolution of Internet, Internet Applications, Internet Protocol -TCP/IP, UDP, HTTP, Secure HTTP (SHTTP) Internet Addressing – Addressing Scheme – Ipv4 & IPv6, Network Byte Order, Domain Name Server and IP Addresses, Mapping. Internet Service Providers, Types Of Connectivity and 3-Tier Web Based Architecture basic.

Unit II: Introductions To HTML: What is HTML -HTML Documents - Basic structure of an HTML document - Creating an HTML document - Mark up Tags - Heading-Paragraphs - Line Breaks - HTML Tags.

Unit III: Elements Of HTML: Introduction to elements of HTML - Working with Text - Working with Lists, Tables and Frames - Working with Hyperlinks, Images and Multimedia - Working with Forms and controls.

Unit IV: Introductions To Cascading Style Sheets: Concept of CSS - Creating Style Sheet - CSS Properties - CSS Styling(Background, Text Format, Controlling Fonts) - Working with block elements and objects - Working with Lists and Tables - CSS Id and Class - Box Model(Introduction, Border properties, Padding Properties, Margin properties)

Unit V: Introductions To Web Publishing And Hosting: Style Sheet Advanced (Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector) - CSS Color - Creating page Layout and Site Designs. Creating the Web Site - Saving the site - Working on the web site - Creating web site structure - Creating Titles for web pages - Themes-Publishing web sites.

Text & Reference Books:

1. Kogent Learning Solutions Inc. HTML 5 in simple steps Dreamtech Press A beginner's guide to HTML NCSA.
2. Murray, Tom/Lynchburg Creating a Web Page and Web Site College, 2002
3. Web Designing & Architecture-Educational Technology Centre University of Buffalo Steven M. Schafer
4. HTML, XHTML, and CSS Bible, 5ed Wiley India
5. John Duckett Beginning HTML, XHTML, CSS, and JavaScript Wiley India
6. Ian Pouncey, Richard York Beginning CSS: Cascading Style Sheets for Web Design Wiley India

MSU/2016-17/UG-Colleges/Part-IV (B.Com with Computer Applications)
Semester-IV / Ppr.no.22/Allied Practical

INTRODUCTION TO INTERNET AND HTML PRACTICAL

1. Design a digital calculator using HTML and Java Script
2. Write a HTML code to add bold and italic words to your document, save it and view.
3. Write a HTML code to add a header to your document, save and view.
4. Write a HTML code to add paragraph and break tags to your document, save it and view.
5. Write a HTML code to add a horizontal rule where appropriate, save it and view.
6. Write a HTML code to add an unordered list to your document, save it and view.
7. Write a HTML code to add an ordered list to your document, save it and view.
8. Write a HTML code to create a new file called Myfile.htm. and establish a link to Google.com
9. Write a HTML code to add an image to your document using the image tag.
10. Write a HTML code to make the top row a table header, save it and view.
11. Write a HTML code to align all data elements to the middle of their cells, save it and view.
12. Write a HTML code to add create and align an image to the right and put a border around the image with a value of 1, save it and view.

Record note	: 15 marks,
Programme Writing	: 15×2=30 marks,
Debugging	: 10×2=20 marks,
Result	: 5×2=10 marks.

MSU/2016-17/UG-Colleges/Part-IV (B.Com with Computer Applications)
Semester-IV / Ppr.no.23 (A) /Skill Based – II (A)

INTRODUCTION TO DATABASE MANAGEMENT SYSTEM

Unit I: Introduction To Databases And Transactions: Introduction to database system, purpose of database system, types of databases, view of data, relational databases, database architecture, transaction management.

Unit II: Data Models: The importance of data models, various data models, Basic building blocks, Business rules, evolution of data models, Degrees of data abstraction.

Unit III: Database Design, Er-Diagram And Unified Modeling Language: Database design and ER Model: overview, ER-Model, Constraints, ER-Diagrams, ERD Issues, weak entity sets, Codd's rules, Relational Schemas. Introduction to UML Relational database model: Logical view of data, keys, integrity rules. Relational Database design: features of good relational database design, atomic domain and Normalization (1NF, 2NF, 3NF).

Unit IV: Relational Algebra And Calculus: Relational algebra: introduction, Selection and projection, set operations, renaming, Joins, Division, syntax, semantics. Operators, grouping and ungrouping, relational comparison. Calculus: Tuple relational calculus, Domain relational Calculus, calculus versus algebra, computational capabilities.

Unit V: Concurrency Control, Constraints, Views And SQL: Constraints, types of constrains, Integrity constraints, Views: Introduction to views, data independence, security, updates on views, comparison between tables and views SQL: data definition, aggregate function, Null Values, nested sub queries, various types of Joined relations. Triggers, database recovery management, concurrency control.

Text &Reference Books:

1. A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts", Sixth Edition McGraw-Hill, January 28, 2010. ,
2. Rob, Coronel, "Database Systems", Seventh Edition, Cengage Learning
3. Raghu Ramakrishnan , "Database Management Systems".
4. Bipin Desai, An Introduction to Database Systems".

MSU/2016-17/UG-Colleges/Part-IV (B.Com with Computer Applications)
Semester-IV / Ppr.no.23 (B) / Skill Based - II (B)

MANAGEMENT INFORMATION SYSTEM

Unit I: Management information system: meaning – features – requisites of an effective MIS – MIS Model – components – subsystems of an MIS – role and importance – corporate planning for MIS – growth of MIS in an organization – centralization vs decentralization of MIS. Support – Limitations of MIS.

Unit II: System concepts – elements of system – characteristics of a system – types of system – categories of information system – system development life cycle – system enhancement.

Unit III: Information systems in business and management: Transaction processing system: Information repeating and executive information system.

Unit IV: Database management systems – conceptual presentation – client server architectures networks.

Unit V: Functional management information system: Financial – accounting – marketing – production – Human resource – business process outsourcing.

Text & Reference Books:

1. Gordon B.Davis & Margrethe H.Olson, “Management information system”. McGraw Hill Publishing.
2. Aman Jindal, “Management Information system, Kalayani publishers.
3. Dr.S.P.Rajagopalan, Management information system – Margham Publishing
4. A.K.Gupta – management information system – S.Chand & Co.
5. C.S.V.Murthy – Management information system
6. Sadagopan .S – Management information system

MSU/2016-17/UG-Colleges/Part-IV (B.Com with Computer Applications)
Semester-IV / Ppr.no.24 (A) / Non-Major Elective – II (A)

INTRODUCTION TO COMPUTER ARCHITECTURE

Unit I: Basic Structure of Computers: Functional units - Basic operational concepts - Bus structures -Memory operations – Instruction and instruction sequencing - Registers- Basic I/O operations–Design on Basic Computer.

Unit II: Arithmetic Units: Addition and subtraction of signed numbers – Design of simple adder and subtractor – Multiplication of positive numbers - Integer division – Floating point numbers and operations.

Unit III: Basic Processing Unit: Arithmetic and Logic Unit – Control Logic Unit - Register set – Multiple bus organization - Fundamental concepts of addressing modes.

Unit IV: Memory System: Basic concepts – Semiconductor RAMs - ROMs – Cache memories - Virtual memory- Memory Management requirements – Secondary storage.

Unit V: Gates, Stacks And Queues: Functionally Basic Gates: AND, OR, NOT, NAND & NOR Basic Stacks and queues operation: FIFO, LIFO.

. Text & Reference Books:

1. Mano M., Computer System Architecture, 3rd Edition, Prentice-Hall Inc. 1993
2. William Stallings, “Computer Organization and Architecture – Designing for Performance”, 6th Edition, Pearson Education, 2003
3. John P.Hayes, “Computer Architecture and Organization”, 3rd Edition, McGraw-Hill, 1998.
4. David A.Patterson and John L.Hennessy, “Computer Organization and Design: The hardware and software interface”, 2nd Edition, Morgan Kaufmann, 2002.
5. Tanenbaum, A., Structured Computer Organization, 4th ed., PrenticeHall Inc. 1999.

**MSU/2016-17/UG-Colleges/Part-IV (B.Com with Computer Applications)
Semester-IV / Ppr.no.24 (B) / Non-Major Elective – II (B)**

HUMAN RIGHTS

Unit I: Meaning - Definition of Human Rights - Characteristics of human rights - kinds of Human Rights - Civil and political – social, economic and cultural rights

Unit II: Violation of human rights - Patterns of violations and abuses - Action against violation of human rights as per Indian law

Unit III: Rights of the Disabled Persons - Declaration on the rights of disabled persons 1975 - International year of disabled persons 1981

Unit IV: Bonded labour - Concepts and definitions - Constitutional and legal provisions - Salient features of bonded labour system (abolition) Act 1976 - Role of the national human rights commission

Unit V: Minorities Rights commission & its functions - Definitions - National commission for minorities - Functions of the commissions

Text & Reference Books:

1. Paras Diwan, Peerushi Dewan , Human Rights and Law.
2. Dr. Giriraj Shah, IPS & K.N. Gupta, IPS, Human Rights.
3. Jagannath Mohany , Teaching of Human Rights.
4. C. Nirmala Devi, Human Rights
5. Praveen Vadkar, Concepts, Theories and Practice of Human Rights, Neha Publishers
6. Baradat Sergio and Swaranjali Ghosh, Teaching of Human Rights, Dominant Publishers and Distributors, New Delhi, 2009.
7. Roy.A.N. Human Rights Tasks, Duties and Functions: Aavishakar Publications and Distributors, Jaipur.
8. Asish Kumar Das and Prasant Kumar Mohanty, Human Rights in India: Sarup and sons, New Delhi, 2000

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

B.Sc. Chemistry

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem.	Pt. I/II/III/IV/V	Sub No.	Subject status	Subject Title	Hrs./week	Credits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	I	17	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	18	Language	English	6	3	25	75	100	30	40
	III	19	Core - 5	ORGANIC CHEMISTRY- II	4	5	25	75	100	30	40
		20	Major Practical – III	INORGANIC QUANTITATIVE ANALYSIS	3	-	50	50	100	20	40
		21	Allied -III	ALLIED CHEMISTRY- I	4	3	25	75	100	30	40
		22	Allied Practical-III	QUANTITATIVE ANALYSIS	2	-	50	50	100	20	40
	IV	23	Skilled Based subject-I	(A)AGROCHEMISTRY (OR) (B) FOOD CHEMISTRY	3	3	25	75	100	30	40
	IV	24	Non-Major Elective-I	(A) FOOD CHEMISTRY (OR) (B) WATER MANAGEMENT	2	2	25	75	100	30	40
Subtotal					30	19					

Sem.	Pt. I/II/III/IV/V	Sub. No.	Subject status	Subject Title	Hrs. / week	Credits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	I	25	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	26	Language	English	6	3	25	75	100	30	40
	III	27	Core - 6	PHYSICAL CHEMISTRY -II	4	5	25	75	100	30	40
		28	Major Practical-IV	INORGANIC QUANTITATIVE ANALYSIS	3	3	50	50	100	20	40
		29	Allied -IV	ALLIED CHEMISTRY - II	4	3	25	75	100	30	40
		30	Allied Practical-IV	QUANTITATIVE ANALYSIS	2	2	50	50	100	20	40
	IV	31	Skill Based Subject -II	(A)CHEMISTRY IN MEDICINE (OR) (B) INDUSTRIAL CHEMISTRY	3	3	25	75	100	30	40
	IV	32	Non-Major Elective-II	(A) DAIRY CHEMISTRY (OR) (C) APPLIED CHEMISTRY	2	2	25	75	100	30	40
	V		Extension Activity	NCC,NSS, YRC, YWF		1					
Subtotal					30	25					

ORGANIC CHEMISTRY- II

UNIT - I ALDEHYDES AND KETONES

Structure and reactivity of carbonyl group – relative reactivities of aldehydes and ketones – mechanism of nucleophilic addition reaction (HCN, NaHSO₃, Grignard reagent) – mechanism of aldol condensation, crossed aldol condensation, Knoevenagal reaction, Reformatsky reaction. Study of the following reactions – Wolff-Kishner reduction, Wittig reaction, Meerwein Ponndorf Verley reduction. Preparation, properties and uses of chloral, acrolein, crotonaldehyde and succinaldehyde.

UNIT-II CARBOXYLIC ACIDS & ACID DERIVATIVES

Structure of carboxylic acid and carboxylate anion – relative strengths of monocarboxylic acids – effect of substituents on acidity – Hell – Volhard – Zelinsky reaction- action of heat on hydroxy acids- preparation, properties and uses of lactic acid and citric acid–dicarboxylic acids: action of heat on dicarboxylic acids - preparation, properties and uses of oxalic acid and succinic acid
Acid anhydrides – Amides –Preparation, properties and structure of urea –Esters- mechanism of esterification and ester hydrolysis.

UNIT-III ORGANOMETALLIC COMPOUNDS AND ORGANO SULPHUR COMPOUNDS

Preparation, structure and synthetic uses of Grignard reagent-preparation and reactions of methyl lithium, diethyl zinc and tetraethyl lead-Reformatsky reaction Preparation and properties of thioalcohols and thioethers – sulphonal-mustard gas and sulphones

UNIT –IV REACTIVE METHYLENE COMPOUNDS & TAUTOMERISM

Reactivity of methylene groups – preparation and synthetic uses of diethyl malonate and ethyl acetoacetate. Tautomerism – definition – various types, keto – enol, amido – imido, nitro – acinitro and oxime – nitrosotautomerism.

UNIT-V ALICYCLIC COMPOUNDS

Nomenclature -general methods of preparation – spectroscopic properties – chemical properties – relative stabilities of cyclo alkanes – Baeyer’s strain theory –Sachse-Mohr theory – Coulson and Moffit’s concept – conformations of cyclohexane and monosubstitutedcyclohexanes - largering compounds – synthesis and structure of civetone and muscone (structure elucidation not necessary).

Reference Books

1. K.S. Tewari, N.K. Vishil, S.N. Mehotra – A text book of org. chem – 1st edition, Vikas Publishing House Pvt Ltd., 2001, New Delhi.
2. P.L. Soni, Text Book of Organic chemistry, Sultans chand, 1991, New Delhi,
3. Bahl and ArunBahl, Organic Chemistry, S. Chand and Sons, New Delhi, 2005.
4. M.K. Jain and S. C. Sharma, Modern Organic Chemistry
- 5.Organic Chemistry - R.T.Morrison and Boyd - Prentice Hall
- 6.Advanced General Organic Chemistry - SachinK.Ghosh - Books and Allied (P) Ltd
7. Organic Chemistry – Bhupinder Mehta and Manju Mehta - PHI Learning Pvt Ltd.

Major Practical -III

INORGANIC QUANTITATIVE ANALYSIS

Objectives

- ❖ To enable the students to understand various procedures in salt analysis.
- ❖ To create an awareness on ecofriendly approach in salt analysis

Qualitative analysis of inorganic salt mixtures containing two acidic radicals (one should be an interfering radical) and two basic radicals

1. Acidic radicals

Simple acidic radicals:

Carbonate, Nitrate, Sulphate, Chloride and Bromide.

Interfering acidic radicals:

Borate, Fluoride, Oxalate and Phosphate.

2. Basic radicals

Group I : Lead

Group II : Copper, Cadmium, Bismuth.

Group III : Ferric iron

Group IV : Cobalt, Nickel, Manganese, Zinc.

Group V : Barium, Strontium, Calcium

Group VI : Magnesium, Ammonium.

Internal – 25 marks

05 marks - Regularity

20 marks – Average of best eight salt mixtures in regular class work

External -75 marks

15 marks – Record (atleast 8 salt mixtures)*

60 marks – Analysis (15 marks for each radical)

*Experiments done in the class alone should be recorded

(Students having a bonafide record only should be permitted to appear for the practical examination)

Reference books:

1. V.V. Ramanujam, Inorganic Semi Micro Qualitative Analysis, 3rd edition, The National Publishing Company, Chennai, 1974.

3. Vogel's Text Book of Inorganic Qualitative Analysis, 4th edition, ELBS, London, 1974

ALLIED CHEMISTRY - I

Objective

- To learn about atomic structure and bonding.
- To learn the principles of reactions of organic compounds.
- To study about photochemical reactions.
- To learn about the importance of polymers and polymer science.
- To study about lubricants and some cosmetics in the modern world.

Unit I – Inorganic chemistry

Atomic structure : electronic configuration - Aufbau principle - Pauli's exclusion principle- Hund's rule. Bonding : electrovalent, covalent, hydrogen bonds-orbital overlap - s-s, s-p. Hybridization and VESPR theory - CH₄, C₂H₄, C₂H₂- BeCl₂, BF₃, NH₃, H₂O, PCl₅, IF₅, IF₇.

Unit II - Organic chemistry – Principles of reactions

Heterolytic and homolytic cleavage - nucleophiles and electrophiles-reaction intermediates – preparation and properties of carbonium ions, carbanions and free radicals -type of reactions - substitution, addition, elimination and polymerisation reactions.

Unit III-Physical chemistry - Photochemistry

Definition-comparison between thermal and photochemical reactions-Laws of photochemistry-Beer Lambert's law-Grothus Draper law-Einstein's law-Quantum yield-low and high quantum yield-determination of quantum yield-fluorescence, phosphorescence, thermoluminescence, chemiluminescence and bioluminescence-definition with examples-photosensitisation.

Unit IV-Polymer Chemistry

Definition- Monomers, Oligomers and Polymers - Classification of polymers- natural, synthetic- linear, cross linked and network- plastics, elastomers, fibres- homopolymers and copolymers.Thermoplastics: polyethylene, polypropylene, polystyrene, polyacrylonitrile, poly vinyl chloride, nylon and polyester - Thermosetting Plastics : phenol formaldehyde and epoxide resin-Elastomers: natural rubber and synthetic rubber - Buna - N, Buna-S and neoprene.

Unit V-Applied Chemistry

Lubricants-classification-criteria of good lubricating oils-synthetic lubricating oils-poly glycols and poly alkene oxides-greases or semi solid lubricants-examples-solid lubricants-graphite

Preparation and uses of shampoo, nail polish, sun screens, tooth powder, tooth paste, boot polish, moth ball and chalk piece.

Reference Books

1. B. R. Puri, L. R. Sharma and K. C. Kalia, Principles of Inorganic Chemistry
2. P. L. Soni, Text Book of Inorganic Chemistry
3. K. S. Tewari and N. K. Vishnoi, A Text Book of Organic Chemistry.
4. Arun Bahl and B.S. Bahl, Advanced Organic Chemistry, S. Chand and Sons.
5. M.K. Jain and S. C. Sharma, Modern Organic Chemistry
6. K.K.Rohatgi Mukherjee, Fundamentals of photochemistry , Wiley Eastern Ltd.
7. B.R. Puri and L.R. Sharma, Principles of Physical Chemistry, Chand & Co.
8. Malcom P. Stevens, Polymer Chemistry – An Introduction
9. V.R. Gowariker, Polymer Science, Wiley Eastern, 1995.
10. Sawyer.W, Experimental cosmetics, Dover publishers, New york, 2000.

Allied Practical - IV

Quantitative Analysis

Objective:

To enable the students to acquire the quantitative skills in volumetric analysis.
Acidimetry and alkalimetry

1. Estimation of oxalic acid – Std. oxalic acid
2. Estimation of Na_2CO_3 – Std. Na_2CO_3
3. Estimation of hydrochloric acid – Std. oxalic acid

Permanganometry

4. Estimation of ferrous ammonium sulphate – Std. ferrous ammonium sulphate
5. Estimation of oxalic acid – Std. oxalic acid
6. Estimation of ferrous sulphate – Std. oxalic acid
7. Iodometry
8. Estimation of $\text{K}_2\text{Cr}_2\text{O}_7$ – Std. $\text{K}_2\text{Cr}_2\text{O}_7$

Dichrometry

9. Estimation of ferrous iron – Std. ferrous ammonium sulphate

Complexometry

10. Estimation of Zn – Std. ZnSO_4
 11. Estimation of Mg – Std. ZnSO_4
-

Note:

Internal – 25 marks

5 marks - Regularity

20 marks – Average of best eight estimations in regular class work

External -75 marks

15 marks – Record (atleast 8 volumetric estimations)*

10 marks – Procedure

50 marks – Result

*Experiments done in the class alone should be recorded

(Students having bonafide record only should be permitted to appear for the practical examination)

Skilled Based –I (A)

AGROCHEMISTRY

UNIT – I

Fertilizers : Classification, macronutrients -role of nitrogen, potassium and phosphorus on plant growth – manufacture of urea, muriate potash and triple superphosphate. Complex fertilizers, mixed fertilizers & biofertilizers – their composition. Micronutrients – their role in plants.

Manures : Bulky organic manures – Farm yard manure - oil cakes - blood meal – fish manures - Composting process – handling and storage

UNIT – II

Pesticides : Definition - Classification of Pesticides based on the use and chemical composition – examples - general methods of application – Benefits of pesticides - Potential hazards. Safety measures -first aid.

Insecticides : Plant products – Nicotine, pyrethrin – Inorganic pesticides – borates. Organic pesticides – D.D.T. and BHC.

Fungicide : Sulphur compounds, Copper compounds, Bordeaux mixture.

Herbicides : Acaricides – Rodenticides. Attractants – Repellants.

UNIT –III

Soil: Origin of soil - definition of soil - rock system - weathering of rocks and minerals- main components of soil - organic, inorganic constituents - soil formation - factors favouring soil formation.

UNIT –IV

Characteristics of soil: Physical aspects - soil texture - pore space - bulk density, particle density - soil colour - surface area - soil colloids - plasticity, shrinkage - flocculation and deflocculation, soil air, soil temperature and their importance in plant growth.

Acid, alkaline and saline soils – diagnosis - Methods of reclamation and after care.

Skilled Based –I (A)

UNIT –V

Soil testing: concept and objectives – soil sampling , tools, collection, processing, dispatch of soil sample.

Estimation of total organic compound, available nitrogen and phosphorus in the soil sample.

Determination of pH, EC, moisture content, bulk density and particle density of the soil sample.

Reference books:

1. A text book of Soil Science – Daji.A, Asia Publishing House, Madras 1970.
2. Textbook of soil Chemical Analysis – Hesse,P.R.A John Murray Newyork,1971
3. Textbook of Soil Science - Biswas,T.D and Mukherjee,S.K.Second edition, Tata McGraw-Hill Education
4. Chemistry for Agriculture and Ecology-Y.Mido M.Satake, Discovery Publishing House.
5. Soil Fertility & Fertilisers – Samuel L.Tisdale, Werner L.Nelson, James D.Beaton, John L. Havlin. Fifth edition, Macmillan
6. Nature and properties of soils-Harry, O Buckman N Yle C. Brandy, Macmillan
7. Insecticides, Pesticides and Agro based Industries – R.C.Paliwal, K.Goel, R.K.Gupta, Small Business Publications

Skilled Based –I (B)

FOOD CHEMISTRY

Objectives:

To acquire the basic knowledge of food chemistry

UNIT - I CONSTITUTION OF FOOD

Food - definition - classification of food - energy requirements of individuals - source, classification and function of carbohydrates, proteins, lipids, vitamins and minerals - calorific values of food - rice, wheat, milk, fish, vegetables, fruits and cereals.

UNIT - II FOOD ADDITIVES AND PRESERVATIVES

Food additives: Definition - permitted food additives, characteristics and their role: antioxidants, stabilizers, flavours, sweeteners, emulsifiers, thickeners, food colourants.

Preservatives: Definition – methods of food preservation - heat, cold, deep-freezing, radiation.

UNIT - III FOOD ADULTERATIONS

Definition - adulterant, adulteration - types of adulterants - common adulterants and their determination in milk, oils, ghee, honey, chilly powder, coriander powder, turmeric powder, coffee powder, tea dust, asafoetida - food poisoning and its prevention – Prevention of Food Adulteration Act- food laboratories and their functions.

UNIT - IV QUALITY STANDARDS

Quality control - specification and standards - FA, FDA, WHO standards - ISI specifications, packing and labeling of foods - Essential Commodities Act, Consumer Protection Act - AGMARK.

UNIT - V LABORATORY WORK

1. Determination of fat, protein and carbohydrate in food stuff.
2. Analysis of fats and oils - iodine value, acid value and RM value.
3. Estimation of glucose by Bertranel method
4. Analysis of starch in foods
5. Isolation of casein from milk

Reference books:

1. Sivasankar B, Food Processing and Preservation, Prentice Hall of India Pvt. Ltd, New Delhi, 2002.
2. Swaminathan M. Textbook on Food Chemistry, Printing and Publishing Co, Ltd, Bangalore 1993.
3. N. S. Gnanaprakasam, G. Ramamurthy, Organic Chemistry, Lab Manual, S. Viswanathan Printers and Publishers Ltd.
4. Food Science – III Edition – B. Sri Lakshmi, New Age International Publisher, 2005.
5. Fundamentals of Foods and Nutrition – Mudambi. R. Sumathi, and Rajagopal, M.V. Willey Eastern Ltd, Madras.

Non Major Elective –I (A)

FOOD CHEMISTRY

Objectives:

To acquire the basic knowledge of food chemistry

UNIT – I INTRODUCTION

Food : sources and classification – food as a source of energy - functions and biological importance of carbohydrates, protein, fat, vitamins and minerals - calorific value of food – energy requirements of individuals - balanced diet.

UNIT - II FOOD ADDITIVES

Definition, food colourants : natural and artificial - antioxidants, stabilizers, flavours, bleaching and maturing agents – leavening agents.

UNIT - III FOOD PRESERVATIVES

Definition - classification - methods of food preservation and processing by heat, cold, radiation, drying and deep freezing.

UNIT - IV FOOD ADULTERATION

Definition – types – detection and analysis of adulterants in foods: milk, chilli powder, coffee powder, turmeric powder, ghee, oil and pulses.

UNIT -V QUALITY STANDARDS

Quality control - specification and standards - FA, WHO standards – packing and labeling of foods, Essential Commodities Act - Consumer Protection Act - AGMARK.

Reference books:

1. Sivasankar B, Food Processing and Preservation, Prentice Hall of India Pvt. Ltd, New Delhi, 2002.
2. Swaminathan M. Textbook on Food Chemistry, Printing and Publishing Co, Ltd, Bangalore 1993.
3. Food Science – III Edition – Sri Lakshmi B, New Age International Publisher, 2005.
4. Fundamentals of Foods and Nutrition – Mudambi. R. Sumathi, and Rajagopal, M.V. - Willey Eastern Ltd, Madras.

Non Major Elective- I (B)

WATER MANAGEMENT

Objectives:

To realize the importance of quality water in day to day life

UNIT I - WATER POLLUTION

Definition-sources of water pollution-types of water pollutants: sewage and domestic wastes, industrial effluents, agricultural discharges, detergents, disease causing agents and radioactive materials. Eutrophication and its effects.

UNIT II - WATER QUALITY PARAMETERS

Physical, chemical and biological water quality parameters-water quality standards for drinking water – BIS and WHO. Determination of pH, Total hardness, DO, BOD and COD.

UNIT III - WATER PURIFICATION

Purification of water for drinking purposes: Sedimentation, filtration and disinfection- Desalination: reverse osmosis-Purification of water for industrial purposes: water softening-permutit process and ion-exchange process.

UNIT IV - WASTE WATER TREATMENT

Elementary ideas of waste water treatment: pre-treatment-primary treatment-secondary treatment: aerobic and anaerobic processes –tertiary treatment: evaporation adsorption –chemical precipitation.

UNIT V - RESTORATION AND MANAGEMENT

Importance of lakes and rivers-stresses on the Indian rivers and their effects –A restoration case study: Ganga Action Plan: objectives implementation and drawbacks. Rain water harvesting –water recycling-The water Prevention and control of Pollution Act 1974.

Reference books :

1. A. K. De, Environmental Chemistry, Wiley Eastern Ltd., New Delhi.
2. B. K. Sharma, Environmental Chemistry, Goel Publishing House, Meerut.
3. R. K. Trivedy and P. K. Goel, Chemical and biological methods for water pollution studies, Environmental Publications, Karad, India.
4. BIS 1991, Specification for drinking water, Bureau of Indian Standards, New Delhi
5. WHO 1992, International standards for drinking water, World Health Organisation, Geneva.

PHYSICAL CHEMISTRY -II

UNIT -I THERMODYNAMICS-I

Basic concepts - system, surroundings - types of systems - extensive and intensive properties - state functions and path functions - types of processes - . Exact and inexact differentials -Zeroth law of thermodynamics. Statements of first law - definition of internal energy and enthalpy - heat capacities at constant volume (C_v) and at constant pressure (C_p), relationship between C_p and C_v - calculation of work, heat, internal energy change and enthalpy change for the expansion of an ideal gas under reversible isothermal and adiabatic conditions. Joule-Thomson effect – Joule-Thomson coefficient and its significance - derivation of the expression for Joule-Thomson coefficient - inversion temperature. Kirchoff's equation and its applications - numerical problems.

UNIT II: THERMODYNAMICS-II

Introduction to second law of thermodynamics - spontaneous processes - statement of second law of thermodynamics.

Entropy: Definition –entropy a state function - Trouton's rule. -entropy change in reversible and irreversible processes- Clausius inequality- entropy as function of T and V - entropy as a function of T and P - entropy change in isothermal transformation - entropy change accompanying change of phase— entropy of mixing of ideal gases -physical significance of entropy.

Free energy: Work and free energy functions – definition-general conditions of equilibrium and spontaneity – -physical significance of dA and dG . Temperature and pressure dependence of G - variation of G during isothermal change -Gibbs Helmholtz equation

UNIT III: CHEMICAL EQUILIBRIUM

Reversible and irreversible reactions-nature of chemical equilibrium-Law of mass action-equilibrium constants- K_p , and K_c Thermodynamic derivations- -Relations between K_p & K_c Temperature dependence of equilibrium constant-properties of equilibrium constant –Pressure dependence of equilibrium constant- Application of law of mass action to homogenous and Heterogenous equilibrium- Le-Chatelier principle-application of Le-Chatelier principle to homogenous equilibrium and heterogenous equilibrium –effect of inert gas on equilibrium

UNIT IV : SOLUTIONS

Kinds of solutions — methods for expressing concentration – Molarity, molality, mole fraction, normality, mass fraction, parts per million -solutions of gases in liquid -Solubility of gases in liquids – Henry's law – statement and limitations.

Solutions of liquid in liquid– Binary liquid mixture - Ideal and non ideal solutions – Raoult's law. - deviation from ideal behavior – pressure – composition and temperature – Composition diagrams for completely miscible binary solutions-Fractional distillation –Azeotropic distillation—nature of azeotropic mixtures-partially miscible liquids—consolute temperature- critical solution temperature-system with upper CST, lower CST and upper and lower CST –Liquid crystals, Nematic, Smectic and cholesteric types and their applications

UNIT-V ELECTROCHEMISTRY-I

Metallic and electrolytic conductance – Definitions of specific, equivalent and molar conductances – Relations between them – measurement of conductance and cell constant. Variation of conductance with dilution – Qualitative explanation– Strong and weak electrolytes. Migration of ions – transport number – determination by Hittorf and moving boundary methods – Kohlrausch's law – applications – calculation of equivalent conductance for weak electrolytes and determination of transport number. Ionic mobilities and Ionic conductances. Diffusion and ionic mobility- molar ionic conductance and viscosity- Walden rule-Applications of conductance measurements – Degree of dissociation of weak electrolytes – Determination of Ionic product of water – Determination of solubility of sparingly soluble salts – conductometric titrations- Theory of strong electrolytes – Debye – Huckel – Onsager theory-verification of Onsager equation – Wien and Debye –Falkenhagen effect.

Reference books:

1. Principles of physical chemistry - Puri, Sharma and Pathania, Millennium Edition, Vishal Publishing Co
2. Text Book of physical chemistry - P.L. Soni - Sultan Chand.
3. Atkins' Physical chemistry, 9th Edition, Oxford University Press.
4. Advanced Physical Chemistry - Gurdeep Raj, Goel Publishing House.
5. Physical Chemistry, G.M.Barrow, Tata McGraw Hill.
6. Thermodynamics for chemist S.Glasstor
7. Physical chemistry P.K.Sharma and L.K.Sharma.

Major Practical - III

INORGANIC QUANTITATIVE ANALYSIS

Objectives

- ❖ To enable the students to understand various procedures in salt analysis.
- ❖ To create an awareness on ecofriendly approach in salt analysis

Qualitative analysis of inorganic salt mixtures containing two acidic radicals (one should be an interfering radical) and two basic radicals

4. Acidic radicals

Simple acidic radicals:

Carbonate, Nitrate, Sulphate, Chloride and Bromide.

Interfering acidic radicals:

Borate, Fluoride, Oxalate and Phosphate.

5. Basic radicals

Group I : Lead

Group II : Copper, Cadmium, Bismuth.

Group III : Ferric iron

Group IV : Cobalt, Nickel, Manganese, Zinc.

Group V : Barium, Strontium, Calcium

Group VI : Magnesium, Ammonium.

Internal – 25 marks

05 marks - Regularity

20 marks – Average of best eight salt mixtures in regular class work

External -75 marks

15 marks – Record (atleast 8 salt mixtures)*

60 marks – Analysis (15 marks for each radical)

*Experiments done in the class alone should be recorded

(Students having a bonafide record only should be permitted to appear for the practical examination)

Reference books:

1. V.V. Ramanujam, Inorganic Semi Micro Qualitative Analysis, 3rd edition, The National Publishing Company, Chennai, 1974.
2. Vogel's Text Book of Inorganic Qualitative Analysis, 4th edition, ELBS, London, 1974

ALLIED CHEMISTRY - II

Objectives

- To learn the chemistry of basic aromatic compounds.
- To understand the nuclear particles and few nuclear reactions
- To know about carbohydrates, amino acids, proteins and nucleic acid.
- To study about fuels, fertilizers, cement and glass.
- To know about some common diseases and the drugs used.

UNIT 1: ORGANIC CHEMISTRY

Aromatic compounds

General characteristics of aromatic compounds - aromaticity – Huckel’s rule with examples- non – benzenoid aromatic compounds (definition and examples only)

Preparation, properties and structure of benzene and naphthalene.

UNIT 2 : PHYSICAL CHEMISTRY

Nuclear chemistry

Nuclear stability – n/p ratio – packing fraction – mass defect – binding energy - isotopes, isobars, isotones with examples. Separation of isotopes by diffusion method – group displacement law - radioactive series - Nuclear fission, fusion - Application of radio isotopes (radio diagnosis and therapy, C-14 dating).

UNIT 3 :

BIO CHEMISTRY

Carbohydrates –definition and classification – artificial synthetic sweeteners. Amino acids - classification – amphoteric nature – isoelectric point. Proteins - classification according to composition, solubility and shape - colour reactions - biological action . Nucleic acids – purines, pyrimidines, nucleocides, nucleotides – DNA – structure of DNA – RNA - different types of RNA

UNIT 4 : INDUSTRIAL CHEMISTRY

Fuel gases – Water gas, Producer gas, L.P.G, Gobar gas and Natural gas. Fertilizers – N.P.K and mixed fertilizers. Soaps and detergents – an elementary idea of soaps and detergents. Cleansing action of soaps and detergents. Cement and glass: Portland cement-manufacture only. Manufacture of glass- types and uses borosilicates -photochromic and safety glass.

UNIT-5: PHARMACEUTICAL CHEMISTRY

Common diseases – infective diseases – insect borne –air borne – water borne – hereditary diseases. Definition and examples of analgesics, antipyretics, sulpha drugs, antimalarials and, antibiotics. Diabetes – causes – hyper and hypoglycemic drugs. Indian medicinal plants – tulsi, neem, keezhanelli- their importance

Reference Books

1. Puri, Sharma & Kalia, Principles of Inorganic Chemistry, Milestone Publishers and Distributors, 2008.
2. P.L. Soni, Text book of Inorganic Chemistry, Sultan Chand and Sons, 2007.
3. Bahl and Arun Bahl, Organic Chemistry, S. Chand and Sons, New Delhi , 2005.
4. Morrison & Boyd, Organic Chemistry, VIth ed, Prentice Hall of India Pvt. Ltd., New Delhi, 1998.
5. P. L. Soni, Text book of Organic Chemistry, S. Chand and Company Ltd., New Delhi .
6. J. L. Jain, Sunjay Jain and Nitin Jain, Fundamentals of Biochemistry, S. Chand and Company Ltd.,New Delhi, 2005.
6. S. Lakshmi, Pharmaceutical Chemistry, S. Chand and Sons, New Delhi , 1995.

Allied Practical - IV

Quantitative Analysis

Objective:

To enable the students to acquire the quantitative skills in volumetric analysis.

Acidimetry and alkalimetry

12. Estimation of oxalic acid – Std. oxalic acid
13. Estimation of Na_2CO_3 – Std. Na_2CO_3
14. Estimation of hydrochloric acid – Std. oxalic acid

Permanganometry

15. Estimation of ferrous ammonium sulphate – Std. ferrous ammonium sulphate
16. Estimation of oxalic acid – Std. oxalic acid
17. Estimation of ferrous sulphate – Std. oxalic acid
18. Iodometry
19. Estimation of $\text{K}_2\text{Cr}_2\text{O}_7$ – Std. $\text{K}_2\text{Cr}_2\text{O}_7$

Dichrometry

20. Estimation of ferrous iron – Std. ferrous ammonium sulphate

Complexometry

21. Estimation of Zn – Std. ZnSO_4
22. Estimation of Mg – Std. ZnSO_4

Note:

Internal – 25 marks

5 marks - Regularity

20 marks – Average of best eight estimations in regular class work

External -75 marks

15 marks – Record (atleast 8 volumetric estimations)*

10 marks – Procedure

50 marks – Result

*Experiments done in the class alone should be recorded

(Students having bonafide record only should be permitted to appear for the practical examination)

Skilled Based –II (A)

Chemistry in Medicine

Objectives

- To have knowledge of first aid and the important rules.
- To know the common chemicals in medicine
- To have awareness of common diseases
- To learn the diagnostic tests and to know the importance of vitamins.

Unit- I: FIRST AID

First Aid for accidents-important rules-first aid kit ,First aid for cuts, bruises, bleeding, fractures, burns, fainting and poisonous bites. Common poisons-Acid poisoning-antidote, Alkali poisoning-antidote, Poisoning by disinfectant- symptoms-antidote, Alkaloid poisoning-symptoms-antidote, alcohol poisoning-symptoms-antidote, Mercury poisoning-antidote and Salicylate poisoning-antidote.

Unit-II: CHEMICALS IN MEDICINE

(Preparations and chemical equations not required) Alum-properties and uses- Aluminium hydroxide gel-uses-Dried Aluminium hydroxide gel-uses-Aluminium acetate-uses-Ferrous fumarate-uses-Ferric ammonium citrate-uses.Ferrous gluconate-uses,Ferrous sulphate. Biological importance of sodium, potassium, calcium ,Iodine and copper.

Unit-III: CAUSES AND TREATMENT OF SOME COMMON DISEASES:

Insect borne diseases – malaria and filariasis Prevention and treatment. Air borne diseases – diphtheria, whooping cough, influenza, measles, mumps, common cold, tuberculosis and leprosy- Prevention and treatment. Water borne – cholera, typhoid and diarrhoeal diseases -Prevention and treatment. Respiratory disorder – Prevention and treatment of asthma .Nervous disorder – epilepsy—Prevention and treatment - other diseases – Peptic ulcer- treatment.

Unit- IV: CLINICAL CHEMISTRY

Clinical chemistry – Composition of blood – blood grouping - determination of blood groups and matching – blood pressure – hypertension – determination.Determination of glucose in serum – Folin and Wu's method - determination of serum cholesterol – Sackett's method – tests for cholesterol. Estimation of glucose in urine – Diagnostic test for sugar in urine- Benedict's test-Clinistix-strip test Diagnostic test for salts in urine and serum. Detection of diabetes ,detection of anaemia. Estimation of hemoglobin(Hb concentration) – estimation of red blood cells Normal RBC count in adults.

Skilled Based –II (A)

Unit V : HEALTH CARE MEDICINES

Vitamins-Classification of Vitamins-Sources- deficiency diseases of Vitamins A, D, E, K, B₁, B₂, B_c, B₆, B₁₂ and C –Therapeutic uses. Treatment of ulcers and skin diseases.

Books for Reference.

1. Practical Biochemistry – David Plummer – 2005, Tata McGraw-Hills Publishing Company.
2. Text Book of Pharmaceutical Chemistry – Jeyashree Gosh – 2003, S.Chand and Company, New Dehi.
3. Medicinal Chemistry – G.R.Chatwal, 2002, Himalaya Publishing House, New Delhi.

Skilled Based-II (B)

INDUSTRIAL CHEMISTRY

Objectives:

To gain knowledge about systems of units and conversion factor

To understand utilities in chemical industries

To know the severity of corrosion and methods of preventing it

To study the industrial process of silicate industry

To acquire the knowledge about the unit process

UNIT I - UNITS AND DIMENSIONS, MATERIAL BALANCE

Fundamental and derived quantities – System of unit – significance of dimensional analysis – forces – weight – volume – pressure – work – energy – power. Basic chemical calculations: Atomic mass – Molar mass – concept of mole, gmol, comparison of liquid mixtures and gaseous mixtures, percentage of mass, volume and mol – ideal gas laws – Dalton's law, Amagat's law and Henry's law – density and pressure measurements.

Material balance without chemical reaction: Material balance equation – transient and steady state – simple material balance with and without recycle and bypass or chemical engineering operations such as evaporation, drying, filtration, extraction and crystallization.

UNIT II - FUELS AND FURNACES

Fuels – types of fuels – calorific values – ignition point – pyrometric effect – explosives range – Flue gas analysis by Orsat's method – explosives – classifications – low explosives – initiating explosives – high explosives – rocket propellants – nuclear fuels.

Furnaces – types of furnaces – Kilns – Blast furnace, reverberatory furnace – muffle furnace – electric furnace – regenerative furnace, open hearth furnace – Bessemer converter – vertical retort furnace.

UNIT III - CORROSION AND PROTECTIVE COATING

Introduction – severity of corrosion – chemical and electrochemical corrosion – mechanism – factors influencing corrosion – control of corrosion – cathodic and anodic protection.

Paints – characteristics of paint – constituents of paints - pigments – vehicles – thinners – driers – fillers – plasticizers – anti skinning agents – their function and properties.

Metallic coating – removal of surface contamination – removal of superficial corrosion products – polishing – galvanizing – tinning – electroplating.

Skilled Based-II (B)

UNIT IV - SILICATE INDUSTRY

Refractories – requirements of refractories – properties of refractories – solid refractories – fire clay refractories – magnesite refractories, dolomite bricks, graphite refractories, zirconia refractories, silicon carbide.

Abrasives – classifications – natural (diamond, corundum, emery, garnet, quartz and flint) and artificial (carborundum, alundum, boron carbide, metallic abrasives). Uses of abrasives – cement manufacture – setting and hardening of cements – gypsum – plaster of Paris – manufacture – setting and hardening – uses. White wares manufacture – types – glazing.

UNIT V - UNIT PROCESSES IN ORGANIC MANUFACTURE

Sulphonation – uses and applications of sulphonates and sulphates – sulphonating agents – sulphur trioxide – organic complexes – chemical and physical factors in sulphonation – commercial sulphonation of benzene – batch vs continuous sulphonation. Hydrolysis – hydrolyzing agents – mechanism of hydrolysis.

Oxidation – types of oxidation reactions – oxidizing agents – permanganate and dichromate – liquid phase oxidation – vapour phase oxidation – commercial manufacture of acetic acid. Hydrogenation – catalysts for hydrogenation - hydrogenation of vegetable oils.

Reference books:

1. Industrial Chemistry, B. K. Sharma, Goel Publishing House, Meerut.
2. Industrial Chemistry, B. N. Chakrabarty, Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta.
3. Unit Operations I & II K. A. Gavhane, Nirali Prakashan, Pune.
4. Unit Processes in Organic Synthesis, P. H. Groggins, Tata McGraw-Hill Publishing Company limited, New Delhi.
5. Stoichiometry – B. Z. Bhatt and S. M. Vora.
6. Engineering Chemistry, Jain and Jain.

Non Major Elective -II (A)

DAIRY CHEMISTRY

Objectives:

- To learn the composition and properties of milk
- To understand the chemical composition of milk and milk processing.
- To know the chemistry of cream and butter
- To study to fermented milk products
- To know the condensed milk and dairy detergents

UNIT-I PROPERTIES OF MILK

Definition, Composition, Milk lipids, Milk proteins, vitamins and minerals. Factors affecting the composition of milk - adulterants, preservatives, and neutralizer - examples and their detection.

UNIT-II PROCESSING OF MILK

Destruction of microorganisms in milk – physicochemical changes during processing – boiling, pasteurization – pasteurization types – bottle pasteurization –batch pasteurization – HTST (High Temperature Short Time) – vacuum pasteurization –(UHT) Ultra High Temperature Pasteurisation.

UNIT-III MILK PRODUCTS-I

Milk Products: Cream - definition, classification – manufacturing - chemistry of creaming process - physico-chemical properties – separation of cream , estimation of fat in cream , Butter - definition, classification, composition, theory of churning, desibutter, salted butter. Ghee - major constituents, common adulterants and their detection.

UNIT-IV MILK PRODUCTS-II

Fermented milk products - fermentation of milk - definition and conditions. Ice creams - definition, composition, types, manufacture of ice - cream, stabilizers, emulsifiers, and their role, milk powder - definition, process of making milk powder.

UNIT –V CONDENSED MILK AND DAIRY DETERGENTS

Condensed milk – definition, classification and differences between condensed milk and skim – condensed milk – sanitation - pasteurization – nutritive value of milk – difference between cow milk and buffaloes milk- milk enzymes. Dairy Detergents : Definition-characteristics-classification-washing procedure (modern method) sterilization-chloramin-T and hypochlorite solution.

Non Major Elective –II (A)

Reference books :

1. Applied Chemistry-K.Bagavathi Sundari MJP Publishers Chennai. 2006.
2. Principles of dairy technology - Robert Jenness, Wiley, New York
3. Indian Dairy Products - Rangappa and Acharya, K.T. Asia Publishing House, Bombay, India.
4. Fundamentals of Dairy chemistry - Wond. F.P. Springer.
5. Outlines of Dairy Technology - Sukumar De. – Oxford University Press.
6. Applied chemistry for home science & allied science - T.Jacob, Mcmillan.

Non Major Elective –II (B)

APPLIED CHEMISTRY

Objectives:

To acquire knowledge about the chemicals used in day to day life

UNIT I - SOAPS AND DETERGENTS

Soaps: Definition-classification-raw materials used in the manufacture of soap –manufacture of toilet soap.

Detergents: Definition –various types with examples- advantages of detergents over soaps –cleansing action of soap.

UNIT II- FERTILIZERS

Definition-characteristics of a good fertilizer- role of nitrogen, potassium and phosphorous in plant growth – natural fertilizers- chemical fertilizers: urea, muriate of potash and triple superphosphate - mixed fertilizers - biofertilizers – advantages of biofertilizers.

UNIT III - POLYMERS

Fibers: Classification –uses of terylene, nylon and orlon.

Resins: Natural resins- synthetic resins-type-uses of fevicol, quick fix, araldite, glyptal and Bakelite.

Plastics: classification- differences between thermoplasts and thermosets. Advantages of plastics-uses of polythene, PVC, polystyrene, Teflon and thermocole.

Rubber: Types-defects in natural rubber-vulcanization-synthetic rubbers- uses of neoprene, thiocol, butyl rubber, silicone rubber and foam rubber.

UNIT IV - CHEMICALS IN PHARMACY

Definition and therapeutic uses of the following (an elementary study only)

Antiseptics: alum, boric acid

Mouth washes: Hydrogen peroxide

Antacids: Aluminium hydroxide

Analgesics: Aspirin, paracetamol

Antibiotics: Penicillins, tetracyclines

Haematinics: Ferrous fumarate, ferrous gluconate

Laxatives: Epsom salt, milk of magnesia

Sedatives: Diazepam

Non Major Elective -II (B)

UNIT V - CHEMICALS IN DAY-TO-DAY LIFE

An outline of the preparation and uses of the following articles.

Tooth powder, tooth paste, writing inks, gum paste, boot polish, talcum powder, chalk crayons, agar battis, phenyl and moth balls.

Reference books:

1. B. K. Sharma, Industrial Chemistry, Goel Publishing House, Meerut.
2. Jeyashree Gosh, A text book of Pharmaceutical Chemistry, S. Chand and Company, NewDelhi.
3. B. N. Chakrabarty, Industrial Chemistry, Oxford and IBH Publishing Co. Pvt.Ltd., Calcutta.

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

**B.Sc. Computer Science
(Choice Based Credit System)**

**(with effect from the academic year 2016-2017 onwards)
(44th SCAA meeting held on 30.05.2016)**

Sem.	Pt. I/II / III/ IV/ V	Sub No.	Subject status	Subject Title	Hrs/ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	III	15	Core – 3	WEB TECHNOLOGY	6	4	25	75	100	30	40
		16	Core – 4	JAVA PROGRAMMING	6	4	25	75	100	30	40
		17	Major Practical – III	JAVA PROGRAMMING	6	4	50	50	100	20	40
		18	Allied - III	COMPUTER ARCHITECTURE	4	4	25	75	100	30	40
		19	Allied Practical – III	SCRIPTING LANGUAGES	2	2	50	50	100	20	40
IV	20	Skilled Based Practical	PYTHON / SCILAB	4 (1T+ 3P)	(Continue to the next Semester)						
IV	21	Non-Major Elective - I	(A) INTRODUCTION TO COMPUTERS (OR) (B) PROGRAMMING IN C	2	2	25	75	100	30	40	
SUB- TOTAL					30	20					

Sem.	Pt. I/II/III/IV/V	Su b No.	Subject status	Subject Title	Hrs/ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	III	22	Core - 5	DATA STRUCTURES	6	4	25	75	100	30	40
		23	Major Practical - IV	DATA STRUCTURES LAB	6	5	50	50	100	20	40
		24	Major Elective-I (Select any one)	1. MULTIMEDIA APPLICATIONS / 2. EMBEDDED SYSTEM / 3. OPEN SOURCE TECHNOLOGIES	6	4	25	75	100	30	40
		25	Allied - IV	E-COMMERCE	4	4	25	75	100	30	40
		26	Practical - IV	SCRIPTING LANGUAGES	2	4	50	50	100	20	40
		IV	27	Skilled Based subject - II	PHP / XML	4 (1T+ 3P)	2	25	75	100	30
IV	28	Non Major Elective – II	(A) BASIC PROGRAMMING DESIGN (B) FUNDAMENTALS OF INTERNET	2	2	25	75	100	30	40	
V		Extension Activity	NCC, NSS, YRC, YWF		1						
		SUB- TOTAL			30	26					

Web Technology

Unit I

Introduction: What is the Internet-History of Internet-Internet Services and Accessibility-Uses of the Internet-Protocols-Web concepts-The client/server model at the web-Retrieving data from the web. **Internet Protocols:** Introduction – Internet protocols-transmission control protocols-User Datagram protocols - Host Names - Internet applications and application protocols.

Unit II

HTML: Introduction-SGML-DTD-DTD Elements- attributes-outline of an HTML document-Head section-Body section- HTML Tags - HTML forms. **Dynamic HTML:** Introduction- cascading style sheets-DHTML Document object model and collections-Event handling - filters and transitions.

Unit III

JavaScript: Introduction-language elements-objects of JavaScript-other objects- Arrays. **VBScript:** Introduction-embedding VBScript code in an HTML document- comments-variables-operators-procedures-conditional statements-looping constructs- objects & VBScripts-Cookies.

Unit IV

Extensible Mark-Up Language (XML): Syntax of the XML Document – XML Attributes – XML Validation – XML DTD – Building blocks of XML Documents – XSL - XSL Transformation – XML Schema. **Common Gateway Interface (CGI):**Server- Browser interaction –CGI Script Structure – CGI Environment variables - Processing forms- CGI security issues.

Unit V

Servlets: Advantages of Servlets over CGI – Installing Servlets – The Servlet Life Cycle – Servlet API – A simple Servlet – Handling HTTP GET requests - Handling HTTP POST requests – Cookies – Session Tracking – Multi-tier Applications using Database Connectivity – Servlet Chaining. **Java Server Pages (JSP):** Advantages of JSP – Components of JSP – Reading Request Information – Retrieving the Data Posted from a HTML file to a JSP file – JSP Sessions – Cookies – Disabling Sessions. **Active Server Pages (ASP):** Advantages of using ASP – Processing of ASP Scripts with Forms – Variables and Constructs – Subroutines – Include/Virtual – ASP Cookies – ASP Objects – Connecting to data with ASP..

Text Book:

Web Technology A Developer's Perspective, N.P.Gopalan, J. Akilandeswari ,PHI

Reference Book:

1. Web Technology and Design, C.Xavier, New Age International Publishers
2. Web Technologies TCP/IP Architecture and Java Programming Second Edition, Achyut S. Godbole & Atul Kahate, Tata McGraw Hill
3. Web Technology, S. Padma Priya, SCITECH Publications (India)Pvt. Ltd

JAVA PROGRAMMING

UNIT I

Data Types, Variables and Arrays: Primary types – Integers – Floating point types – Characters – Booleans – A Closer Look at Literals – Variables – Type Conversion and Casting – Automatic type Promotion in Expressions - One Dimensional Arrays– Multi Dimensional Arrays. **Operators:** Arithmetic Operators – Bitwise operators – Relational Operators – Boolean Logical Operators – Assignment Operator – Conditional Operator – Operator Precedence-Using parentheses.

UNIT II

Introducing Classes: Class Fundamentals – Declaring objects- Assigning object Reference variables- Introducing Methods- Constructors-Garbage collection – Finalize() Method **A Closer Look at Methods and classes:** Overloading Methods-Using objects as parameters- Argument passing –Returning objects- Recursion-Introducing Access control – understanding static –Introducing final – Nested and Inner classes- String class- Using command line arguments. **Inheritance:** Inheritance Basics –Using super- creating Multilevel Hierarchy - Method overriding –Dynamic Method Dispatch –Using Abstract class –Using final with inheritance-The object class.

UNIT III

Packages and interfaces: Packages –Access Protection – Importing packages-Interfaces. **Exception Handling:** Introduction- Exception Types – Uncaught Exceptions- Using try and catch – Multiple catch clauses –Nested try statements- throw – throws-finally. **Multithreaded programming :** Java Thread Model –Main Thread –Creating a Thread –Creating Multiple Threads – Using is Alive() and join() –Thread priorities

UNIT IV

The Applet class: Applet Basics – Applet Architecture –Applet Skeleton- Applet Display method –Requesting Repainting – HTML APPLET tag- Passing Parameters to Applet. **Event Handling:** Event Handling Mechanisms –Delegation Event Model –Event classes(The Action Event ,Item Event , Key Event, Mouse Event) – Sources of Events - Event Listener Interfaces(Action Listener, Item Listener, Key Listener, Mouse Listener).

UNIT V

Introducing the AWT: AWT Classes – Window fundamentals – working with Frame Windows –working with Graphics– Working with color – Working with Fonts. **Using AWT Controls:** Controls Fundamentals – Labels – Using Buttons –Applying check Boxes – Check Box group – Choice Controls – Using a Text field – Using a Text Area – Understanding Layout Managers [Flow Layout Only] – Menu Bars and Menus.

Text Book:

Java, The Complete Reference 8/e , Herbert Schildt, TMH

Reference Book:

1. Programming with Java –C.Muthu
2. Java Programming A Practical Approach, C.Xavier, TMH
3. Programming in Java, Sachin Malhotra, Saurabh Choudhary, OXFORD University Press
4. Programming with Java a primer 3/E E.BALAGURUSWAMY
5. Core Java, Mahesh P. Matha, PHI Learning Private Limited

JAVA PRACTICAL LIST

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Define a class called Student with the attributes name, reg_number and marks obtained in four subjects(m1,m2,m3,m4). Write a suitable constructor and methods to find the total mark obtained by the student and display the details of the student.
2. Write a Java program to find the area of a square, rectangle and triangle by
 - (i) Overloading Constructor
 - (ii) Overloading Method.
3. Write a java program to add two complex numbers.
[Use passing object as argument and return object].
4. Define a class called Student_super with data members name, roll number and age. Write a suitable constructor and a method output () to display the details. Derive another class Student from Student_super with data members height and weight. Write a constructor and a method output () to display the details which overrides the super class method output().[Apply method Overriding concept].
5. Write a java program to create a package —Employee which contains the classes Emp and Memp. The data members of Emp are name, emp_id, category and Bpay. write suitable constructors and methods to compute net pay of the employee. The class Memp contains the main method.
6. Write a java program to create an interface called Demo, which contains a double type constant, and a method called area () with one double type argument. Implement the interface to find the area of a circle.
7. Write a java program to create a thread using Thread class.
8. Write a java program to Design a calculator to perform only addition and division. It must contains three Buttons with labels +, / and =, and a TextField to get input and display the result.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science) / Semester-III / Ppr.no.17/
Major Practical - III**

9. Create an applet with four Checkboxes with labels MARUTI-800, ZEN, ALTO and ESTEEM and a Text area object. The program must display the details of the car while clicking a particular Checkbox.
10. Write a Java program, which creates a window with a check box group with boxes for the colors, Violet, Indigo, Yellow, Orange, Red, Blue, and Green. When the button is selected the background color must change accordingly.
11. Write a Java program to throw the following exception,
 - 1) Negative Array Size
 - 2) Array Index out of Bounds
12. Write a java program to create a file menu with options New, Save and Close, Edit menu with option cut, copy and paste.

COMPUTER ARCHITECTURE

UNIT I

Basic Computer Organisation And Design : Instruction codes - Computer Registers - Computer Instructions - Timing and Control - Instruction Cycle - Control Memory-Address Sequencing

UNIT II

Central Processing Unit : General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data transfer and manipulation – Program Control.

UNIT III

Computer Arithmetic : Hardware Implementation and Algorithm for Addition, Subtraction, Multiplication, Division-Booth Multiplication Algorithm-Floating Point Arithmetic

UNIT IV

Input Output Organization: Input – Output Interface – Asynchronous data transfer – Modes of transfer – Priority Interrupt – Direct Memory Access (DMA). **Memory Organisation:** Memory Hierarchy - Main memory - Auxillary memory - Associative memory - Cache memory - Virtual memory.

Unit V

Advanced Processing: RISC, CISC Characteristics- Parallel Processing-Pipe Lining- Vector Processing-Array Processor-Multi Processors-Interconnections Structures

Text Book:

Computer system Architecture - by Morris Mano, Third Edition. P.H.I Private Limited.

Reference Books:

1. Computer System Architecture P.V.S. Rao PHI
2. Nirmala Sharma, "Computer Architecture", First Edition,2009,University Science Press
3. Nicholos Carter, "Computer Architecture" ,2006, TMH Publication.

**Practical List - Scripting Languages
(Java Script/ VB Script/HTML)**

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Create a home page using HTML with neat formatting, different fonts and colors.
2. Create a website using internal links and images.
3. Design a calendar using table tag.
4. Create a HTML document to display a list of five flowers and link each one to another document displaying brief description of the flower, Add pictures wherever possible.
5. Write an HTML code to display a list of 5 cars in a frame, Link each one to a brief description in second frame. The left frame should display the list and the right frame should display the paragraph about the frame.
6. Using CSS, design a website.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science)/Semester-III/
Ppr.no.20(A)/Skill Based – I (A)**

Practical List – PYTHON

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
3. WAP to display the first n terms of Fibonacci series.
4. WAP to find factorial of the given number.
5. WAP to find sum of the following series for n terms: $1 - 2/2! + 3/3! - \dots - n/n!$
6. WAP to calculate the sum and product of two compatible matrices.
7. WAP to read n integers and display them as a histogram.
8. WAP to display sine, cosine, polynomial and exponential curves.
9. WAP to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered by the user.
10. Explore String functions.
11. Creating a CSV File based on user input.
12. Reading a CSV File already created and display the contents

Reference Book:

1. Python in easy steps - Mike McGrath - Mc Graw Hill publications
2. Introduction to computation and programming using Python - John V. Guttag - PHI
3. Chun, J Wesley, Core Python Programming, 2 nd Edition, Pearson, 2007 Reprint 2010.

Practical List – SCILAB

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Demonstrate scilab as a calculator(at least 15 calculations)
2. Demonstrate elementary mathematical functions(at least 15 functions)
3. Demonstrate statistics methods(at least 10 functions)
4. Demonstrate matrix operations(at least 5 operations)
5. Demonstrate using functions - arrange an array in ascending order
6. Demonstrate using functions - convert decimal to binary(without using built-in function)
7. Demonstrate plotting few curves defined by $f(x)$ (at least 3 functions)
8. Demonstrate plotting a histogram with proper labels (at least 3 histograms)
9. Demonstrate plotting bar graph with proper labels (at least 3 graphs)
10. Read from a file and plot any graph

References:

1. Scilab - A Hands on Introduction - Satish Annigeri - ebook(pdf)
2. <https://www.scilab.org/>
3. http://www.openeering.com/sites/default/files/First_Steps_0.pdf
4. http://www.openeering.com/sites/default/files/Scilab_calculator.pdf
5. https://www.scilab.org/content/download/849/7901/file/Scilab_beginners.pdf
6. <https://www.scilab.org/content/download/247/1702/file/introscilab.pdf>
7. <http://www.ee.iitm.ac.in/~hsr/scilab/manual.pdf>

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc.Computer Science)/Semester-III/
Ppr.no.21 (A) / Non-Major Elective – I (A)**

Introduction to Computers

UNIT I

Computer Preliminaries: Introduction – Characteristics of a Computer – Generations of Computer – Applications of Computer – Architecture of a Computer – Computer memory – Classification of Computers - Concepts of Hardware and Software.

UNIT II

Peripheral Devices: Input Devices – Keyboard, Pointing Devices, Scanning Devices, Audio and Video input devices. Output Devices – Dot matrix printer, Ink-jet Printer, Laser Printer, Drum Plotter, Flatbed Plotter, Monitors, Projectors, Speaker, Headphone. Storage devices –Hard disk, Optical Storage devices, Solid State devices.

UNIT III

Operating Systems: Introduction – types of User Interface – Functions of Operating System – Getting started with Windows – Windows Explorer – Windows setting – Creating Shortcuts – Windows Accessories.

UNIT IV

Elements of Word Processing : Introduction to Microsoft Office – MS Word – Creating, Opening and Saving a Document – Menu Bar – Formatting the text –View Menu – Insert menu – Tools Menu – Table Manipulation – Window menu – Printing a document.

UNIT V

Computer Networks : Introduction to Computer communication – Client server architecture – Networking components - Uses of Network – Common types of network – Network topology.

Text Book:

Computer Basics to Advancements - by P. Velmani and V. Lakshmi Praba, Chess Educational Publishers, Chennai.

Reference Book:

1. Introduction to Information Technology ITL Education Solutions Limited, Pearson Education.
2. Introduction to Computers, Peter Norton Tata McGraw Hill.
3. Fundamentals of Information Technology By Alexis Leon & Mathews Leon Vikas publication – New Delhi

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc.Computer Science)/Semester-III/
Ppr.no.21 (B)/Non-Major Elective – I (B)**

Programming in C

Unit I

C Declarations:- Introduction – Character Set – C tokens – Keywords and Identifiers – Identifiers – Constants – Variables – Data types – Declaration of Variables – initializing variables – dynamic initialization – type modifiers – type conversion – constant and volatile variables. **Operators and Expressions:-** Introduction – Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operator – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Operator Precedence.

Unit II

Input and Output in C: Introduction – Formatted Functions – Flags, widths and Precision with Format String – Unformatted Functions – Commonly used Library functions. **Decision Statements :** Introduction – Simple IF statement – The IF...Else Statement – Nesting of IF...Else Statements – The ELSE IF ladder – The Break Statement – The Continue Statement – The Goto Statement – The Switch Statement.

Unit III

Loop Control:- Introduction –The WHILE Statement – The DO Statement – The FOR statement – Nested FOR Loops. **Arrays :-** Introduction – One-dimensional arrays – Declaration of One-dimensional arrays – Initialization of One-dimensional arrays – Array terminology -Two-dimensional arrays – Initialization of Two-dimensional arrays.

Unit IV

Strings and Standard functions:- Introduction – Declaring and Initializing String Variables – Display of strings in different formats – String Standard functions – String Conversion Functions. **Unit V**

Functions:- Introduction – Basics of a function - Function definition – The Return statement Types of functions – Call by Value and Reference – Function as an argument – Function with operators – function and decision statements – function and loop statements – functions with arrays.

Text Book:

Programming in C – 3th Edition by Ashok Kamthane – Pearson Education

Reference Book:

1. Computer Basics and C Programming by V. Rajaraman – PHI Learning Private Limited
2. Programming with C, Third Edition, Byron S Gottfried, Tata McGraw Hill Education Private Limited.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science)/
Semester-IV/Ppr.no.22/Core - 5**

DATA STRUCTURES

Unit I

Basic Concepts:- Algorithm specification – Data Abstraction – Performance Analysis.
Arrays and Structures:- Arrays: Abstract data type – Polynomials – Sparse Matrices – Representation of Multidimensional Arrays.

Unit II

Stacks and Queues:- Stacks – Queues – Evaluation of Expressions – Multiple Stacks and Queues. **Linked Lists:-** Singly Linked Lists and Chains – Linked Stacks and Queues – Polynomials: Polynomial Representation – Adding Polynomials. – Additional List Operations: Operations for Circularly Linked Lists. – Sparse Matrices: Sparse Matrix Representation. – Doubly Linked Lists.

Unit III

Trees:- Introduction – Binary Trees – Binary Tree Traversals: Inorder Traversal – Preorder Traversal – Postorder Traversal – Iterative Inorder Traversal. - Threaded Binary Trees – Heaps – Binary Search Trees – Selection Trees – Forests: Transforming a Forest into a Binary Tree. – Representation of Disjoint sets: Introduction – Union and Find operations. – Counting Binary Trees : Distinct Binary Trees.

Unit IV

Graphs: - The Graph Abstract Data Type-Elementary Graph Operations – Minimum Cost Spanning Trees: Kruskal’s Algorithm – Prim’s Algorithm. – Shortest Paths and Transitive Closure: Single Source/ All Destination: Nonnegative Edge Costs – Single Source / All Destination: General Weights – All Pairs Shortest Paths. – Activity Network: Activity-on-Vertex(AOV) Networks.

Unit V

Sorting:- Motivation – Insertion Sort – Quick Sort – Merge Sort: Recursive Merge Sort. – Heap Sort – External Sorting: Introduction – k-way Merging.**Hashing:-** Static Hashing: Hash Tables.

Text Book:

Fundamentals of Data Structures in C by Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed – Second Edition – Universities Press (India) Private Limited.

Reference Books:

1. Data Structures Using C, Second Edition by Reema Thareja – Oxford University Press
2. Data Structures by Dr N Jeya Prakash – Anuradha Publications

Data Structures Lab

It is compulsory to complete all the exercises given in the list in the stipulated time.

(C / C++ / Java)

1. Merging two unsorted Arrays.
2. Inserting a node after a given node and Deleting a given node in a Singly Linked List.
3. Evaluating Arithmetic expression using Postfix notation.
4. Implementation of Circular Queues- Add and delete.
5. Implementation of Binary Tree Traversals using recursion.
 - a) Pre-order
 - b) In-order
 - c) Post-Order
6. Implementation of Breadth First Search algorithm.
7. Implementation of Depth First Search algorithm.
8. Search an element in a list using Binary Search
9. Implementation of Merge Sort
10. Implementation of Quick Sort

**MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science)/
Semester-IV/Ppr.no.24(A)/Major Elective – I (A)**

Multimedia Applications

Unit I

Introduction: Objectives – History of Multimedia – Its market – Content copyright – Resources for multimedia developers – Types of produces – Evaluation – Hardware Architecture – OS and Software – Multimedia Architecture – Software library – Drivers.

Unit II

Text and Graphics : Elements of Text – Text Data files – Using text in Multimedia Application – Hypertext – Elements of Graphics – Images and color – Graphics files and Application formats – Creating images for multimedia use –Using graphics in Application.

Unit III

Digital Audio and Video : Characteristics of sound and Digital audio – Digital Audio systems – MIDI – Audio file formats – Using Audio in Multimedia Applications – Audio for content – Background as video – Characteristics of digital video – digital video data sizing 0 Video capture and playback systems –computer animation.

Unit IV

Product design and Authoring tools: Building blocks – classes of products – Content organizational strategies – story boarding – Multimedia tool selection – Tool feature – categories of Authoring tools – selecting the right authoring paradigm.

Unit V

Multimedia and Internet : Internet – HTML and web authoring – Multimedia considerations for Internet – Design considerations for web pages.

Text Book :

Multimedia Technology and Applications – David Hillman-Galgotia Publications pvt. Ltd, 1998.

Reference Books :

1. Multimedia making it work by Tay Vaughan TMH, 1997
2. Computer Graphics Multimedia and Animation - Malay K. Pakhira PHI , New Delhi - Second edition
3. Principles of Multimedia - Ranjan Parekh - TMGH, New Delhi - Twelfth Reprint,
4. Computer Graphics and Multimedia - Anirban Mukhapathyay, Aruop Chattopadhyay - Vikas Publishing Ltd - Second Edition

MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science)/

Semester-IV/Ppr.no.24 (B)/Major Elective – I (B)

Embedded System

Unit I

Introduction to embedded System – Examples of Embedded Systems – Typical Hardware – Gates – Times Diagram – Memory.

Unit II

Advanced Hardware Fundamentals: Microprocessors Buses – DMA – Interrupts – Built in on the microprocessor – Conventions used on Schematic – Schematic Interrupts Microprocessor Architecture – Interrupt Basics – Shared Data Problem – Interrupt Latency.

Unit III

8051 Micro Controllers: Micro Controllers and Embedded Processors – Overview of 8051 Family – Block Diagram – PIN Description.

Unit IV:

Software Development: Round-Robin, Round Robin with interrupts, Function-Queue-Scheduling Architecture, Algorithms, Introduction to Assembler, Compiler, Cross Compilers and IDE, Recursion, Debugging Strategies, Simulators.

Unit V:

RTOS: Task and Task States, Task and Data, Semaphores and Shared Data. OS Services – Message Queues – Timer Function – Events – Memory Management – Interrupt Routines in RTOS Environment – Basic Design using RTOS.

Text Book:

David E.Simson, An Embedded Software Primer, Pearson Education Asia, 2001.

Reference Books:

1. The 8051 Microcontrollers and Embedded Systems using Assembly and C, Muhammed Ali Mazidi, Rolin D.MCKinlay, Pearson Education.
2. Raj Kamal, Embedded Systems Architecture, Programming and Design, TMH, 2003.

MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science)/

Semester-IV/Ppr.no.24(C)/Major Elective – I (C)

Open Source Technologies

Unit I

Introduction : Open Source, Free Software, Free Software vs. Open Source software, Public Domain Software, FOSS does not mean no cost. History : BSD, The Free Software Foundation and the GNU Project.

Unit II

Open Source History, Initiatives, Principle and methodologies. Philosophy : Software Freedom, Open Source Development Model Licences and Patents: What Is A License, Important FOSS Licenses (Apache,BSD,GPL, LGPL), copyrights and copylefts, Patents Economics of FOSS : Zero Marginal Cost, Income-generation opportunities, Problems with traditional commercial software, Internationalization

Unit III

Community Building: Importance of Communities in Open Source Movement-JBoss Community- Starting and Maintaining an Open Source Project - Open Source Hardware

Unit IV

Apache HTTP Server and its flavors- WAMP server (Windows, Apache, MySQL, PHP)- Apache, MySQL, PHP, JAVA as development platform.

Unit V

Open source vs. closed source Open source government, Open source ethics. Social and Financial impacts of open source technology, Shared software, Shared source.

REFERENCE

1. PDF file available in web sites
2. https://en.wikibooks.org/wiki/Open_Source

E-Commerce

Unit I

History of E-Commerce : Electronic Commerce - Early Business Information Interchange Efforts – Emergence of the Internet – Emergence of the World Wide Web – The Milestones - Advantages of E-commerce – Disadvantages of E-Commerce - Online Extension of a BAM Model – Transition to E-Commerce in India - The Internet and India. **Business Models for E-Commerce** : Social Networking and Facebook – Business Model – E-business Models Based on the Relationship of Transaction Parties – E-business Models Based on the Relationship of Transaction Types.

Unit II

Enabling Technologies of the World Wide Web : World Wide Web – Internet Client-Server Applications - Networks and Internets - Software Agents – Internet Standards and Specifications – Internet Service Providers(ISP) – Hypertext - JavaScripts - XML.

Unit III

e-Marketing - Google – Traditional Marketing – Identifying Web Presence Goals - The Browsing Behaviour Model – Online Marketing – E-advertising – Internet Marketing Trends – Target Markets – E-branding – Marketing strategies.

Unit IV

e-Security : Information System Security – Security on the Internet – E-business Risk Management Issues – Information Security Environments in India.

Unit V

e-Payment Systems : E-banking at ICICI Bank – Main Concerns in Internet Banking - Digital Payment Requirements – Digital Token-based e-Payment Systems – Classification of New Payment Systems - Properties of Electronic Cash(e-cash) – Cheque Payment Systems on the Internet – Risk and e-Payment Systems – Designing e-Payment Systems – Digital Signature – Online Financial Services in India.

TEXT BOOK:

1. P.T.Joseph , S . J, E-Commerce – An Indian Perspective, PHI Learning Pvt Ltd.,2013

Reference Books:

- 1 CSV Murthy, E-Commerce – Concepts Models Strategies, Himalaya Publishing House
2. Bharat Bhasker, Electronic Commerce Framework, Technologies and application, Tata Mcgraw Hill.

Scripting Languages

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Create a simple HTML Form covering major form elements.
2. Create a Navigation bar (with dropdown) with CSS.
3. Embed Audio and Video in an HTML page.
4. Rotate an element using CSS.
5. Build a simple quiz.

Practical List – PHP

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Create a simple HTML form and accept the user name and display the name through PHP echo statement.
2. Write a PHP script to redirect a user to a different page.
3. Write a PHP function to test whether a number is greater than 30, 20 or 10 using ternary operator.
4. Create a PHP script which display the capital and country name from the given array. Sort the list by the name of the country
5. Write a PHP script to calculate and display average temperature, five lowest and highest temperatures.
6. Create a script using a for loop to add all the integers between 0 and 30 and display the total.
7. Write a PHP script using nested for loop that creates a chess board.
8. Write a PHP function that checks if a string is all lower case.
9. Write a PHP script to calculate the difference between two dates.
10. Write a PHP script to display time in a specified time zone.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science)/
Semester-IV/Ppr.no.27(B)/Skill Based – II (B)**

Practical List – XML

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Create your own XML markup, a markup describing a simple letter.
2. Create a CSS file intended to render the file created in a previous exercise
3. Use XSLT to transform the file created in a exercise1 to plain text file
4. Transform an XML document into XHTML
5. Design a simple homepage with XHTML and CSS files.
6. Create a sample XML document containing information about a few hospitals, patients, and doctors.

References

1. Getting Started with XML: A Manual and Workshop by Eric Lease Morgan.
2. Understanding XML A Software Development Approach by Hossein Hassani

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc.Computer Science)/
Semester-IV/Ppr.no.28 (A)/Non- Major Elective – II (A)**

Basic Program Design

Unit I

Computer Program: Introduction – Developing a program – Algorithm – Flowchart – Decision Tables.

Unit II

Program Testing and Debugging – Program Documentation – Program Paradigms: Unstructured programming, Structured programming and Object Oriented Programming – Characteristics of a Good Programming.

Unit III

Computer Languages: Evolution Programming Languages – Classification of Programming Languages – Generation of Programming Languages – Features of Good Programming language.

Unit IV

Computer Software: Software Definition – Relationship between Software and Hardware - Software Categories : System Software and Application Software – Terminology Software Firmware, Liveware, Freeware, Public Domain Software, Shareware, Commercial Software and Proprietary Software.

Unit V

Evolution of Internet - Internet Basics: Basic Internet Terms – Getting connected to Internet - Internet Applications – E-mail – Searching the Web – Internet and Viruses.

Text Book:

Introduction to Computer Science, IITL Education Solutions Limited, 2/e, Pearson

Reference Books:

1. Fundamentals of Computers, V.Rajaram, 5th Edition, PHI
2. Introduction to Computers, Peter Norton, 7/e, TMH.

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc.Computer Science)/
Semester-IV/Ppr.no.28 (B)/Non-Major Elective – II (B)**

Fundamentals of Internet

Unit I

The Internet: Introduction – From Computers to the Internet - Advantages of the Internet – Major Internet Services – Hardware and Software in the Internet Age. **Evolution and Growth of the Internet:** Birth of the Internet – Current Networking Technologies – Next Generation Networking. **Working of the Internet:** The Internet Architecture – Client Server Computing – TCP/IP - The Protocols of the Internet.

Unit II

Getting Online: Types of Internet Accounts – Selecting Internet Service Providers – **Electronic Mail:** Advantages of E-mails – E-mail addresses – Mail transfer protocols – Working of E-mail system. **World Wide Web:** Architecture of the World Wide Web – Types of websites – Uniform Resource Locator – Domain Name System – Web Pages and Web Links – Visiting Web Pages – Using Internet Explorer – Searching the Web – Google and Yahoo Search Engines.

Unit III

Hosting and Promoting Websites: Structure of Websites – Web Development tools – Microsoft Front Page – Adobe Dreamweaver – Visual Studio. NET – Hosting Websites – Getting a Domain /name – Visitor Analysis and Statistics – Website Promoting methods.

Unit IV

Electronic Commerce: E-Business and E-Commerce – Types of business in the internet – M-Commerce - Marketing Strategies on the Web – Making Payments in Virtual Stores – Shopping in Virtual Stores – Cookies and E-Commerce – Major issues of E-commerce and M-Commerce – Future of E-commerce.

Unit V

Blogs and Social Networking: Blogs – Uses of Blogs – Blogs System Components – Steps for Blogging – Building a Blog site – Social Networking – Etiquette in networking sites. **Internet Security:** Importance of Internet Security – Internet Threats – Identity theft and Cybersquatting – Hacking – Spamming and Spoofing – Phishing and Pharming – Denial of Service – spyware – Viruses and worms- Security solutions – Firewalls and Intrusion Prevention Systems – Internet Security Precautions- The Information Technology Act.

Text Book:

The Internet A User's Guide Second Edition by K.L. James – PHI Learning Private Limited

Reference Books:

1. Internet, World Wide Web, How to program, 4th Edition, Paul Deital, Harvey M Deitel, Pearson
2. Learning Internet & Email, 4th Revised Rdition, Ramesh Bangia, Khanna Book Publishing Co Pvt Ltd.
3. Internet & Ecommerce, C. Nellai Kannan, NELS Publications.

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

**B.Sc. Electronics
(Choice Based Credit System)**

(with effect from the academic year 2016-2017 onwards)

(45th SCAA meeting held on 09.02.2017)

Sem	Pt I/II / III/ IV/ V	Sub No.	Subject status	Subject Title	Hrs/ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	III	15	Core – 3	ELECTRONIC CIRCUITS	6	4	25	75	100	30	40
		16	Core – 4	ELECTRONIC MEASUREMENTS AND CIRCUIT THEORY	6	4	25	75	100	30	40
		17	Major Practical – III	CIRCUITS AND MEASUREMENTS LAB	6	4	50	50	100	20	40
		18	Allied III (Allied Electronics for other major students)	ELECTRONIC DEVICES	4	2	25	75	100	30	40
		19	Allied Practical – III (Allied Practical for other major students)	ELECTRONIC DEVICES AND DIGITAL CIRCUITS LAB	2	2	50	50	100	20	40
IV	IV	20	Skilled Based subject –I	CONSUMER ELECTRONIC APPLIANCES	4	4	25	75	100	30	40
IV	IV	21	Non-Major Elective - I	(A)ELECTRONIC TROUBLE SHOOTING (OR) (B)COMPUTER HARDWARE	2	2	25	75	100	30	40
SUB- TOTAL					30	22					

Sem.	Pt I/II/ III/ IV/V	Su b No.	Subject status	Subject Title	Hrs/ week	Cre dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	III	22	Core - 5	LINEAR INTEGRATED CIRCUITS	6	4	25	75	100	30	40
		23	Major Practical - IV	LINEAR INTEGRATED CIRCUITS AND ELECTRONIC CIRCUITS LAB	6	4	50	50	100	20	40
		24	Major Elective-I (Select any one)	(A)COMPUTER NETWORKS (OR) (b) ELECTRICAL MACHINES	6	5	25	75	100	30	40
		25	Allied – IV (Allied Electronics for other major students)	DIGITAL CIRCUITS	4	4	25	75	100	30	40
		26	Practical – IV (Allied Practical for other major students)	ELECTRONIC DEVICES AND DIGITAL CIRCUITS LAB	2	2	50	50	100	20	40
	IV	27	Skilled Based subject - II	MAINTENANCE AND TROUBLESHOOTIN G OF AUDIO AND VIDEO EQUIPMENT	4	4	25	75	100	30	40
	IV	28	Non Major Elective-II (Select any one)	(A) RADIO AND TELEVISION (OR) (B)RADAR AND NAVIGATION	6	2	25	75	100	30	40
	V		Extension Activity	NCC,NSS, YRC, YWF		1					
SUB- TOTAL					30	26					

**MSU/2016-17/UG-Colleges/Part-III /(B.SC.ELECTRONICS)/
Semester-III/Ppr.no.15/Core-3**

ELECTRONIC CIRCUITS

UNIT I

Rectifiers- half wave rectifier, full wave rectifier, bridge rectifier, Inductor- Capacitor-L type filters-ripple factor-Voltage regulator(series type)-current limit over load production-introduction to IC fixed and variable IC 723,78XX,79XX-voltage regulators-formula value substitution problems.

UNIT II

Amplifiers-general principle of operation-classification of amplifiers-classification of distortion (amplitudes, frequency, phase)-RC coupled amplifier-gain-frequency response-input and output impedance -multistage amplifiers-transformer couple amplifiers-frequency response-formula value substitution problems.

UNIT III

Introduction-classification power amplifier-class A power amplifier-class A push pull amplifier-class B power amplifier- class B push pull amplifier- class C power amplifier- class C push pull amplifier-power dissipation output power-distortion-formula value substitution problems.

UNIT IV

Feed back-basic concepts-characteristics-effect of negative feedback- on gain- stability-distortion-band width- analysis of voltage and current feedback amplifier circuits- formula value substitution problems.

UNIT V

Classification of oscillators-use of positive feedback – barkhausen criterion for oscillation-colpitts oscillator-Hartley oscillator-wein bridge oscillator- phase shift oscillator- crystal oscillator-frequency stability of oscillators-multivibrators (mono, astable, bistable)- formula value substitution problems.

BOOKS FOR REFERENCE:

1. Electronic devices and circuits-Millman & Halkias.
2. Electronic devices and applications and Integrated circuits-Mathu.
3. Basic Electronics-B.L.Theraja.
4. Electronic devices and circuits- G.K.Mithal,Khanna publishers.
5. Electronic devices and circuits – Allen mottershead.
6. Problems and solutions of electronic devices and circuits-Experience teachers (CBS publication, New Delhi).

**MSU/2016-17/UG-Colleges/Part-III /(B.SC.ELECTRONICS)/
Semester-III/Ppr.no.16/Core-4**

ELECTRONIC MEASUREMENTS AND CIRCUIT THEORY

UNIT I

Measurements, errors in measurements- measurement standard, Classification and characteristics of Transducers, AC/DC Bridge measurements and their applications.

UNIT II

PMMC – DC ammeter – DC voltmeter - Voltmeter sensitivity - Ohm meter – VOM or Multimeter – Calibration Digital Voltmeters and Multimeters, AC Voltmeter-Vector Voltmeter- CRO- Block Diagram – single beam – dual trace – Sampling Oscilloscope,

UNIT III

Ohms Law-power Energy-resistors in series,parallel- Kirchoff's Laws and their applications – Branch and loop currents- mesh and node analysis.

UNIT IV

Fundamental ideas of AC circuits - impedance of RL, RC, RLC circuits-Resonance in AC circuits-series and parallel.

UNIT V

Network graph of a network- concept of tree- branches and chords dual networks- Network theorems: Superposition, Thevenin, Norton, Maximum Power transfer Theorem

BOOKS FOR REFERENCE:

1. C.S.Rangan "Instrumentation Devices and Systems" Tata McGraw Hill, 1998.
2. Copper "Electronic Instrumentation and Measurement Techniques" PHI
3. A.J. Bouwels "Digital Instrumentation", McGraw Hill, 1986
4. C.Barney "Intelligent Instrumentation" Prentice Hall of India, 1985
5. Oliver and Cage "Electronic Measurements and Instrumentation" McGraw HILL,1975
6. Deobelin "Measurements Systems" McGraw HILL, 1990
7. Electronic circuits – Edminister (Schaum outline series – TMH)
8. Circuits and networks, Analysis and synthesis – A.Sudakar & S.P. Shyammohan (TMH).
9. Networks, analysis and synthesis – Umesh sinha.
10. Electronic circuits Theory – Dr.M.Arumugam & Dr.N.Prem Kumaran (Khanna Publishers)

**MSU/2016-17/UG-Colleges/Part-III/ (B.SC.ELECTRONICS)/
Semester-III/Ppr.no.17/ Major Practical – III**

CIRCUITS AND MEASUREMENTS LAB

All experiments have to be carried out compulsorily from A and B

A. Circuits Lab

1. To familiarize with basic electronic components (R, C, L, diodes, transistors), digital Multimeter, Function Generator and Oscilloscope.
2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
3. Verification of Kirchoff's laws.
4. Verification of Thevenin's theorem
5. Verification of Norton's theorem.
6. Verification of Superposition Theorem.
7. Verification of Reciprocity Theorem.
8. Verification of Maximum Power Transfer Theorem.
9. Transient Response
10. Series resonance.
11. Parallel Resonance

B. Measurements Lab

1. Wheatstone bridge
2. Kelvin double bridge
3. Maxwell bridge
4. Hay bridge
5. Schering bridge
6. LVDT
7. Displacement meter
8. Transducer Applications and Measurement
9. Extension of range of PMMC meter
10. Current Measurement using sensors

* Students should be encouraged to do a mini project which should be submitted at the end of the IV semester

**MSU/2016-17/UG-Colleges/Part-III/(B.SC.ELECTRONICS)/
Semester-III/Ppr.no.18/Allied- III**

ELECTRONIC DEVICES

UNIT I

Basic components used in Electronics -Resistor, capacitor, inductor and their different types - Diodes - Light Emitting diode (LED), Photo diode - Zener diode, LDR .

UNIT II

Power Supplies -Need of a power supply - Types of power supplies - Different types of unregulated and regulated power supplies - IC Regulated power supply - switched mode power supply.

UNIT III

Amplifiers- Transistor as an amplifier - Types of Amplifiers - Single stage amplifier - Amplifiers with feedback - Negative feed back amplifiers.

UNIT IV

Oscillators & Switching circuits - Transistor as an oscillator - Barhausen criteria - Hartley and colpitt's oscillators - Crystal oscillators

UNIT V

Electrical elements-Potential difference- Electric current-Electromotive force-Ohms law- Kirchoff's law- Kirchoff's current law- resistance in series circuits, parallel circuits and Concept of voltage source and current source

TEXT BOOK:

1. Principles of Electronics - V.K. Mehta - S.Chand Publication, New Delhi
2. Electronic devices and circuits - G.J.Mithal, Khana publishers, New Delhi
3. Modern Physics - R.Murugesan - S.Chand publication, New Delhi
4. Basic Electronics - B.L. Theraja - S.Chand publication, New Delhi

BOOK FOR REFERENCE:

1. Electronic devices and circuits - B.Sasikala, S.Poornachandra Scitech publication India Pvt. Ltd., Chennai.
2. Electronic devices and Application and integrated circuits - Mathur kulashethra & Chandra Umesh publication, New Delhi.
3. Hand book of Electronics - Gupta & Kumar, Pragathi prakashan, Delhi.

**MSU/2016-17/UG-Colleges/Part-III/ (B.SC.ELECTRONICS)/
Semester-III/Ppr.no.19/ Allied Practical - III**

ELECTRONIC DEVICES AND DIGITAL CIRCUITS LAB

PART – A

1. Characteristics of PN diode
2. Characteristics of Zener diode
3. Transistor Characteristics – Common base
4. Transistor Characteristics – Common emitter
5. Transistor Characteristics – Common collector
6. Measurement of stability factor of self biasing method
7. Measurement of stability factor of fixed biasing method
8. FET Characteristics
9. Photoconductivity of LDR
10. Characteristics of Photo diode
11. Characteristics of SCR
12. Characteristics of Photo transistor

**MSU/2016-17/UG-Colleges/Part-III/(B.SC.ELECTRONICS)/
Semester-III/Ppr.no.20/ Skill Based Subject – I**

CONSUMER ELECTRONIC APPLIANCES

UNIT I

MICROWAVE OVENS

Microwaves - Properties and generation - Microwave oven block diagram - LCD timer with alarm - Controllers - Wiring and Safety instructions - Care and Cleaning.

UNIT II

WASHING MACHINES

Electronic controller for washing machines - Washing machine hardware and software - Types of washing machines - Fuzzy logic washing machines - Features of washing machines.

UNIT III

AIR CONDITIONERS AND REFRIGERATORS

Air Conditioning - Components of air conditioning systems - All water air conditioning systems - All air conditioning systems - Unitary and central air conditioning systems - Split air conditioners.

UNIT IV

HOME / OFFICE DIGITAL DEVICES

Facsimile machine - Xerographic copier - Calculators - Structure of a calculator - Internal Organization of a calculators - Servicing electronic calculators - Digital clocks - Block diagram of a digital clock.

UNIT V

DIGITAL ACCESS DEVICES

Digital computer - Internet access - Online ticket reservation - Functions and networks - Barcode Scanner and decoder - Electronic Fund Transfer - Automated Teller Machines (ATMs) - Set-Top boxes - Digital cable TV - Video on demand.

TEXT BOOK:

1. Consumer Electronic - S.P. Bali, Pearson Education, New Delhi, 2005.

**MSU/2016-17/UG-Colleges/Part-III/(B.SC.ELECTRONICS)/
Semester-III/Ppr.no.21 (A)/ Non- Major Elective – I (A)**

ELECTRONIC TROUBLESHOOTING

UNIT I

Corrective maintenance-Troubleshooting-Repairing troubles-Testing or operational check-Troubleshooting aids-corrective maintenance time-intermittent troubles-Precautions while trouble shooting and repair

UNIT II

Preventive maintenance-Merits and demerits of preventive maintenance-Preventive maintenance program- Maintenance schedule-Maintenance record-shut down planning-calibration - inspection

UNIT III

Classification of printed circuit boards-Manufacturing process-Repair of PCB's

UNIT IV

Digital test instruments-Basic digital Measurements-Testing digital circuits-Digital equipment service literature-Digital trouble shooting—use of some test equipments

UNIT V

Troubleshooting laboratory and Industrial equipments—Power supplies , oscillators, function generators-Speed controllers-C.R.O

TEXT BOOK

Maintenance of Electronic Equipments-K.S Jamwal- Dhanpat Rai &Co

**MSU/2016-17/UG-Colleges/Part-III/(B.SC.ELECTRONICS)/
Semester-III/Ppr.no.21(B)/ Non- Major Elective – I (B)**

COMPUTER HARDWARE

UNIT I

CPU essentials – processor modes – modern CPU concepts – Architectural performance features – the Intel's CPU

UNIT II

Essential memory concepts – memory organizations – memory packages –modules – logical memory organizations – memory considerations – memory types – memory techniques – selecting and installing memory.

UNIT III

Active motherboards – sockets and slots – Intel D850GB – Pentium4 mother board – expansion slots – form factor – upgrading a mother board – chipsets –north bridge – south bridge

UNIT IV

Power supplies and power management – concepts of switching regulation – potential Power problems – power management. The floppy drive – magnetic storage – magnetic recording principles – data and disk organization – floppy drive – hard drive – data organization and hard drive – sector layout

UNIT V

IDE drive standard and features – Hard drive electronics – CDROM drive – construction – CDROM electronics – DVD-ROM – DVD media – DVD drive and decoder.

TEXT BOOK:

1. Stephen J.Bigelow, "Trouble Shooting, maintaining and Repairing PCs", Tata McGraw-Hill, New Delhi, 2001.

BOOK FOR REFERENCE:

1. Craig Zacker & John Rourke, "The complete reference: PC hardware", Tata McGraw-Hill, New Delhi, 2001.
2. Mike Meyers, "Introduction to PC Hardware and Trouble shooting", Tata McGraw-Hill, New Delhi, 2003.
3. B.Govindarajulu, "IBM PC and Clones hardware trouble shooting and Maintenance", Tata McGraw-Hill, New Delhi, 2002.

LINEAR INTEGRATED CIRCUITS

UNIT I

Differential amplifiers-dual input-balance output differential amplifier- current mirror- level translator- block diagram representation of typical op amp- interpreting a typical set of data sheets- the ideal opamp- equivalent circuit of an op amp- ideal voltage transfer curve.

UNIT II

Input offset voltage – input bias current- input offset current- total output offset voltage- input and output resistance-thermal drift-CMRR-voltage shunt and voltage series feedback amplifiers.

UNIT III

Frequency response of initially compensated op amp- circuit stability-slew rate. Filters: low pass filters- high pass filters- band pass filters-band reject filters-all pass filters.

UNIT IV

Adder-subtractor-Integrator-differentiator – V to I and I to V converter.

Oscillator: Principles-types-frequency stability phase shift oscillator-wein bridge oscillator- square wave generator –triangular wave generator.

UNIT V

Comparator-Schmitt trigger-clipper and clamper-peak detector-zero crossing detectors- IC-555 function block diagram-mono stable operation –astable operation –applications

BOOKS FOR REFERENCE

1. Linear Integrated Circuits- D.Roychoudry & Shail Jain (New age publications 1999).
2. Operational amplifiers and linear integrated circuits-F.Couglin & Drison (4th edition prentice hall of India, 1992).
3. Operational amplifiers and linear integrated circuits- Denton J.Dailey, McGraw Hill 1989.
4. Operational amplifiers and linear integrated circuits-Ramakant A.Gayakwad 3rd edition PHI.
5. Second Edn. Operational amplifiers and Linear Ics-David A. Bell.

**MSU/2016-17/UG-Colleges/Part-III (B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.23/ Core Practical –IV**

LINEAR INTEGRATED CIRCUITS AND ELECTRONIC CIRCUITS LAB

All experiments have to be carried out compulsorily from A and B

A. Linear Integrated Circuits Lab

1. Inverting and Non Inverting Amplifier.
2. Integrator and Differentiator.
3. Instrumentation Amplifier.
4. High pass, Low pass and Band pass filters.
5. Astable and Monostable multivibrator using OP-AMP.
6. Phase shift and Wien Bridge oscillator using OP-AMP.
7. Digital to Analog Converter, Analog to Digital Converter.
8. Astable Multivibrator and Monostable Multivibrator using IC555.
9. Schmitt Trigger and Comparator using OP-AMP.
10. Design of light switch using LDR and Relay.

B. Electronic Circuits Lab

1. Half wave rectifier and Full wave rectifier
2. Construction of power supply using C filter and zener diode as regulator.
3. Characteristics of Class A Power Amplifier
4. Characteristics of Class B Power Amplifier
5. Design a Single Stage CE amplifier.
6. Design of Two stage RC coupled Amplifier
7. Clipping and Clamping circuits
8. Hartley Oscillator
9. Colpitt's Oscillator.
10. Astable Multivibrator using BJT.

**MSU/2016-17/UG-Colleges/Part-III(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.24(A)/ Major Elective – I (A)**

COMPUTER NETWORKS

UNIT I

Data Communication Concepts: Transmission media – Data encoding – Interface and Modems – Multiplexing – Error detection and correction – Digital subscriber line – Circuit switching – Packet switching – Message switching.

UNIT II

Wide Area Networks: ISO – OSI layered architecture – Function of the layers – Data link protocols – HDLC, LAPB, LAPD, Inter networking devices – Repeaters, Bridges, Routers, Routing algorithms – Distance vector routing, link state routing, X.25 protocol, congestion control.

UNIT III

Frame relay and ATM networks: Frame relay operation – layers and traffic control; ATM networks – Architecture switching, layers service classes.

UNIT IV

Local Area Network: LAN topology – Ethernet – Token bus – Token ring – FDDI – Wireless LAN, ATM LAN – IEEE 802 Medium access control layer standard – Random access protocols – ALOHA – Slotted ALOHA.

UNIT V

OSI Layers: Transport layer issues – Session layer – Synchronization – Presentation layer – Encryption, decryption, Application layer – Message handling system, file transfer, virtual terminal – E-mail.

TEXT BOOK

1. William Stallings, "Data and Computer Communication", sixth edition, Pearson education Asia, 2000.

REFERENCES

1. Behrouz A, Forouzan, "Data Communication and Networking", second edition, Tata McGraw-Hill, 2000.
2. Fred Halsall, "Data Communication, Computer networks and Open Systems", Fourth edition, Addison Wesley, 1995.
3. Andrew S.Tanenbaum, "Computer networks", Third edition, PHI, 1996,

**MSU/2016-17/UG-Colleges/Part-III(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.24(B) Major Elective – I (B)**

ELECTRICAL MACHINES

UNIT I

D.C Motors: Motor Principle-Comparison of motor and generator action- characteristics of shunt, series and compound wound motors -starting – 3-point and 4-point starters – Calculation of resistance elements for shunt motor starters – methods of speed control of shunt, series and compound wound motors – Electric braking –Electronic speed control.

UNIT II

DC Generator-Working principle –Parts of DC Generator–Types of armature windings-EMF equation of generator-Characteristics of dc generator-classification of DC generator-self excitation – Armature reaction- remedies-commutation-Methods of removing commutation-losses in DC generators-Efficiency of DC generator-Rating of a generator

UNIT III

Transformers-Working principle of transformers-Transformer construction-Core type transformer-shell type transformer-voltage transformation ratio-losses-Efficiency- Rating-Construction and use of autotransformer-parallel operation of transformer

UNIT IV

Alternator-Working principle-Parts-types-relation between Speed-Poles-Frequency-coil span and distribution factor-Equation of Alternator-Rating-losses-Synchronization-Parallel operation of alternators

UNIT V

Single phase motors-Induction motor-Shaded pole-Split phase-Capacitor motor-Capacitor start-Capacitor start capacitor run-Universal motor or AC series motor-Repulsion motor-synchronous motors-applications 3 ϕ Induction motor- Squirrel cage motor-Slipring induction motor-Double squirrel cage induction motor-Starting of induction motor-Star delta starter-Determining phase sequence-Speed control-Magnetic locking-Losses.

TEXT BOOK

Electrical Technology-B.L Theraja A.K Theraja

REFERENCE

Basic electrical Engg -P.S Dhogal TMH

MSU/2016-17/UG-Colleges/Part-III/(B.SC.ELECTRONICS)/

Semester-IV/Ppr.no.25/ Allied- IV

DIGITAL CIRCUITS

UNIT I

Basics and Number systems-Digital signals – Basic Digital circuits – NAND, NOR, EX-OR – Universality of NAND and NOR – Number systems – Conversions.

UNIT II

Combinational Logic Design-Boolean Algebra – Demorgan's Theorem – Karnaugh Map – Don't care condition – Multiplexer – Demultiplexer.

UNIT III

Flipflops-Rs flipflop – JKFF – D FF – T FF – Master slave FF – Applications

UNIT IV

Shift Registers and counters-Registers – Left shift, Right shift, Parallel in parallel out Counters – Ripple counter, Decade counter – Modulo counters.

UNIT V

Memories-RAM – static, Dynamic – Diode ROM – PROM – EPROM – E2 PROM

TEXT BOOK

1. Modern Digital electronics : R.P. Jain, TataMcGraw Hill 1997
2. Digital Electronics, V.K. Puri, Tata Mc Graw Hill
3. Computer System Aaraachitecture, 2nd Edition, M. Marris mano, Prentice Hall, 1998

**MSU/2016-17/UG-Colleges/Part-III(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.26/ Allied Practical – IV
ELECTRONIC DEVICES AND DIGITAL CIRCUITS LAB**

PART – A (Carried out in third semester)

1. Characteristics of PN diode
2. Characteristics of Zener diode
3. Transistor Characteristics – Common base
4. Transistor Characteristics – Common emitter
5. Transistor Characteristics – Common collector
6. Measurement of stability factor of self biasing method
7. Measurement of stability factor of fixed biasing method
8. FET Characteristics
9. Photoconductivity of LDR
10. Characteristics of Photo diode
11. Characteristics of SCR
12. Characteristics of Photo transistor

PART – B (To be carried out in fourth semester)

1. Study of AND, OR, NOT, NAND, NOR and XOR gates using IC
2. Designing of all the logic gates using NAND gate IC
3. Designing of all the logic gates using NOR gate IC
4. Verification of Demorgan's theorems
5. Construction of gates using discrete components
6. Code conversion
7. Half adder and Full adder
8. Half subtractor and Full subtractor
9. Multiplexer and De-Multiplexer
10. Encoder and Decoder
11. Study of Flip flops
12. Shift register
13. Ripple counter

**MSU/2016-17/UG-Colleges/Part-III(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.27/ Skilled Based Subject – II**

**MAINTENANCE AND TROUBLE SHOOTING OF AUDIO
AND VIDEO EQUIPMENTS**

UNIT I

Recording and reproduction principles - Optical recording - Different types - Methods of recording and reproduction - Optical recording on compact disc - play back process - Advantage of compact disc - Trouble shooting in compact disc.

UNIT II

Stereophony - Stereophonic recording on disc and reproduction - Hi-Fi Stereo reproducing system - Block diagram of Public Addressing system - Requirement of Public Addressing system - Typical PA installation planning for a public meeting - PA system for an auditorium troubleshooting in PA system.

UNIT III

Monochrome, PAL colour TV transmitters Faults in TV transmitter - Testing of TV transmissions monochrome TV receiver - Fault in monochrome TV receiver - PAL colour TV receiver - Faults in colour TV receiver - Testing of TV receiver.

UNIT IV

Video disc format - Video recording on disk - Very High density disk - High definition TV system - Block diagram of MAC encoder - MAC receiver - Advantages.

UNIT V

Digital TV system - Cable TV concepts set top box - Dish TV and connections - Closed circuit television - Introduction to FLAT LCD and Plasma television systems.

TEXTBOOKS

1. Electronic Instruments and systems, Principles, Maintenance and Troubleshooting - R.G. Gupta Tata Mc Graw Hill Publishing Co.Ltd.
2. Colour Television Theory and Practice - S.P. Bali, Tata Mc Graw Hill Publishing Co.Ltd.

REFERENCE BOOKS

1. Audio and Video systems - R.G. Gupta Tata Mc Graw Hill Publishing Co.Ltd.
2. Monochrome and Colour Television - R. Gulati. New Age Interbational (P) Ltd. New Delhi.

**MSU/2016-17/UG-Colleges/Part-IV/(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.28(A) /Non-Major Elective - II (A)**

RADIO AND TELEVISION

UNIT I

Radio Communications- Radio waves – Frequency & Wavelength – Modulation – Propagation of radio waves – Ground, Sky and Space waves – Fading – Radio Broadcast – Transmission and Reception.

UNIT II

Radio Transmission-Classification of radio waves – Amplitude modulation – Frequency modulation – Radio transmitter – AM transmitter – Antennas (transmitting antenna), Basic ideas.

UNIT III

Radio Reception- Reception and detection of amplitude modulated waves – Function of a radio receiver – Characteristics of a receiver – Super heterodyne receiver – FM Broadcast receiver.

Unit IV

TV Transmission-TV broadcasting system – scanning – Synchronization – Blanking – Video Signal – Television band and channels – Camera tubes – Image orthicon Vision.

UNIT V

TV Reception-TV receiver – Tuner – Picture section – Receiver sweep section – Sound section power supply section – Color Mixing principles in color TV.

TEXT BOOKS

1. Basic Television and Video Systems, B.Grob, McGraw Hill
2. Electronics and Radio Engineering, F.E. Terman, McGraw Hill

REFERENCE BOOK

- 1.Monochrome and Color Television, R.R. Gulari, Wiley Eastern Ltd.,

**MSU/2016-17/UG-Colleges/Part-IV/(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.28 (B) /Non Major Elective - II (B)**

RADAR AND NAVIGATION

UNIT I

An Introduction to Radar: Basic Radar, The simple form of the Radar Equation Block schematic of pulse radar- Radar frequencies- Applications of radar, the origins of Radar

UNIT-II

CW radar- applications of CW radar- CW radar with nonzero IF- FM CW radar-FM CW altimeter-MTI and Pulse Doppler radar.

UNIT-III

Introduction to Doppler and MTI Radar, delay line Cancellers, digital MTI processing, Moving target detector, pulse Doppler Radar

UNIT IV

Direction finders- Instrument Landing System- Radio ranges. Navigation- Hyperbolic navigation-LORAN. Satellite navigation- Doppler navigation

UNIT-V

Global positioning system- Different types of microwave antennas-basic principles. Microwave passive devices, Coaxial connectors and adapters, Phase shifters, Attenuators, Waveguide Tees, Magic tees,

TEXT BOOKS

1. Microwave Devices and circuits- Liao / Pearson Education
2. Introduction to Radar systems-Merrill I Skolnik, 3rd Ed, TMH, 2001.
3. Microwave Engineering – Annapurna Das, Sisir K Das TMH Publication, 2001

REFERENCE BOOK

1. Microwave Engineering – David M Pozar, John Wiley, 2e, 2004
2. Microwave devices and circuit: Samuel Liao, PHI.
3. Microwave and radar — A K Maini, Khanna Publishers.
4. Microwave and Radar Engg. — M Kulkarni.
5. Introduction to radar systems — Merrill I Skolnik, McGraw Hill.
6. Radar systems and radio aids to navigation — A K Sen & A B Bhattacharya.

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

B.Sc. Mathematics

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem.	Pt. I/II/III I/ IV/V	Sub No.	Subject status	Subject Title	Hrs./ week	Cre- dits	Marks					
							Maximum			Passing minimum		
							Int	Ext.	Tot.	Ext.	Tot.	
III	I	13	Language	Tamil/Other Language	6	3	25	75	100	30	40	
	II	14	Language	English	6	3	25	75	100	30	40	
	III	15	Core - 5	REAL ANALYSIS - I	6	5	25	75	100	30	40	
		16	Allied – III	STATISTICS -I / PHYSICS/ CHEMISTRY	6	5	25	75	100	30	40	
				For Other UG Programme								Mathematics – ALGEBRA AND DIFFERENTIAL EQUATIONS (For Science Students)
				For the Current UG Programme								STATISTICS –I (For Mathematics Students)
	IV	17	Skilled Based Subject -I	VECTOR CALCULUS	4	4	25	75	100	30	40	
	IV	18	Non-Major Elective –I (any one of the following)	(A) MATHEMATICS FOR COMPETITIVE EXAMINATIONS- I (or) (B)FUNDAMENTALS OF STATISTICS - I	2	2	25	75	100	30	40	
Subtotal					30	22						

Sem.	Pt. I/II/II I/ IV/V	Sub No.	Subject status	Subject Title	Hrs./ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int	Ext.	Tot.	Ext.	Tot.
IV	I	19	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	20	Language	English	6	3	25	75	100	30	40
	III	21	Core - 6	ABSTRACT ALGEBRA	6	5	25	75	100	30	40
		22	Allied - IV	STATISTICS -II/ PHYSICS/ CHEMISTRY	6	5	25	75	100	30	40
			For Other UG Programme	Mathematics – VECTOR CALCULUS & FOURIER SERIES (For Science Students)							
			For the Current UG Programme	STATISTICS –II (For Mathematics Students)							
	IV	23	Skilled Based Subject -II	TRIGONOMETRY, LAPLACE TRANSFORMS AND FOURIER SERIES	4	4	25	75	100	30	40
	IV	24	Non-Major Elective –II (any one of the following)	(A) MATHEMATICS FOR COMPETITIVE EXAMINATIONS-II (or) (B)FUNDAMENTALS OF STATISTICS - II	2	2	25	75	100	30	40
	V		Extension Activity	NCC, NSS, YRC, YWF		1					
Subtotal					30	23					

**MSU/2016-17/UG-Colleges /Part-III (B.Sc. Mathematics)/
Semester-III /Ppr.no.15/ Core-5**

REAL ANALYSIS - I

- Unit I** **Real number system :**
The field of axioms, the order axioms, the rational numbers, the irrational numbers, upper bounds, maximum element, least upper bound (supremum). The completeness axiom, absolute values, the triangle inequality. Cauchy – schwartz's inequality.
- Unit II** **Sequences :** Bounded sequences – monotonic sequences – convergent sequences – divergent and oscillating sequences – The algebra of limits.
- Unit III** Behaviour of monotonic sequences – Cauchy's first limit theorem – Cauchy's second limit theorem – Cesaro's theorem – subsequences - Cauchy sequence – Cauchy's general principle of convergence.
- Unit IV** Series : Infinite series – n^{th} term test – Comparison test – Kummer's test – D'Alembert's ratio test – Raabe's test - Gauss test – Root test – Cauchy's condensation test (without proof)
- Unit V** Alternating series – Leibnitz's test - Tests for convergence of series of arbitrary terms – Power series – Taylor's series – Maclaurin's series.

Text Books:

- Arumugam .S and Thengapandi Issac – “sequences and series”, New Gamma publishing House, Palayamkottai – 627 002.
- Tom M. Apostol – Mathematical Analysis, II Edition, Narosa Publishing House, New Delhi (unit I)

Book for Reference :

- Goldberg .R – Methods of Real Analysis, Oxford and IBH Publishing Co., New Delhi.

**MSU/2016-17/UG-Colleges/ Part-III (B.Sc. Mathematics)/Semester-III/
Ppr.no.16 (A)/Allied - III**

**Allied Statistics
(For Mathematics Students)**

Statistics – I

- Unit I** Moments, Skewness and Kurtosis - Curve fitting - method of least squares – Fitting lines – Parabolic, Exponential and Logarithmic curves.
- Unit II** Correlation and Regression – Scatter Diagram – Karl Pearson’s coefficient of correlation – Properties – Lines of Regression – Coefficient of Regression and properties – Rank Correlation.
- Unit III** Association of Attributes – Consistency of data – criteria for independence – Yule’s coefficient of Association.
- Unit IV** Random variable – Distribution function – properties of Distribution function – Mathematical Expectation – Addition theorem of Expectation – Multiplication theorem of Expectation – Moment generating function – cumulants – characteristic function – Properties of characteristic function.
- Unit V** Discrete and continuous Probability Distributions - Binomial and Poisson Distribution and their moments, Generating function, characteristic function, properties and simple applications. Normal Distribution – Standard normal distribution and their properties – simple problems.

Books for Reference :

1. Gupta .S.C and V.K. Kapoor – Fundamentals of Mathematical Statistics – (2002) Sultan Chand & Sons, New Delhi.
2. Vittal, V.R. – Mathematical Statistics (2004) Maragatham Publications
3. D.C. Sancheti & Kapoor – Statistics
4. M.L. Khanna – Statistics
5. S. Arumugam & others – Statistics

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Mathematics) /
Semester-III/ Ppr.no.16 (B)/Allied -III**

(For Science Students)

Algebra and Differential Equations

- Unit I** Theory of Equations – Formation of Equations – Relation between roots and coefficients – Reciprocal equations.
- Unit II** Transformation of Equations – Approximate solutions to equations – Newton’s method and Horner’s method.
- Unit III** Matrices – Characteristic equation of a matrix – Eigen values and Eigen vectors – Cayley Hamilton theorem and simple problems.
- Unit IV** Differential equation of first order but of higher degree – Equations solvable for p , x , y – Partial differential equations – formations – solutions – Standard form $P_p + Q_q = R$.
- Unit V** Laplace transformation – Inverse Laplace transform.

Books for Reference :

1. Dr. S. Arumugam & others – Allied Mathematics – I

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Mathematics)/
Semester -III/Ppr.no.17/Skilled Based -I**

VECTOR CALCULUS

- Unit I** Vector point functions – Scalar point functions – Derivative of a Vector & Derivative of sum of vectors – Derivative of product of a Scalar and Vector point function – The vector operator ‘del’ - Gradient
- Unit II** Divergence – Curl, solenoidal, irrotational vectors – Laplacian operator.
- Unit III** Integration of point function – Line integral – Surface integral,
- Unit IV** Volume integral – Gauss divergence theorem (statement only) – Problems.
- Unit V** Greens theorem and Stoke’s theorem (statements only) – problems.

Text Book:

- Durai Pandian .P and Laxmi Durai Pandian – Vector Analysis (Revised Edition – Reprint 2005) Emerald Publishers.

Books for Reference :

- Dr. S. Arumugam and others – Vector Calculus, New Gamma Publishing House.
- Susan .J.C - Vector Calculus, (4th Edn.) Pearson Education, Boston 2012.
- Anil Kumar Sharma, - Text book of Vector Calculus, Discovery Publishing House, 1993.

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) /
Semester-III/ Ppr.no.18(A)/Non Major Elective –I (A)**

Mathematics for Competitive Examinations -I

Unit I Simplifications, averages

Unit II Ratio and proportion

Unit III Partnership - Percentage

Unit IV Profit and Loss

Unit V Problems on numbers

Books for Reference :

1. Objective Arithmetic – R.S. Aggarwal – S.Chand & Co.
2. Quantitative Aptitude for Competitive examinations – Abhijit Guha – TMH
3. Mathematics for life – M. Immaculate – Nanjil offset Printers

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) /
Semester-III/ Ppr.no.18 (B)/Non Major Elective –I (B)**

Fundamentals of Statistics - I

- Unit I** Classification of datas – Bar diagram – Pie chart
- Unit II** Measures of Central tendency : Mean, median, mode (with frequency)
- Unit III** Measures of dispersion : Range – standard deviation, variance – Quartile deviation.
- Unit IV** Correlation – rank correlation (Problems only)
- Unit V** Regression equations (Problem only)

Books for Reference :

1. S.P. Gupta – Statistics
2. Dr. S. Arumugam – Statistics
3. M.L. Khanna – Statistics

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Mathematics)/
Semester -IV/Ppr.no.21/Core -6**

ABSTRACT ALGEBRA

- Unit I** Groups – definition and Examples – Subgroup – order of an element – centre of a group – Normalizer and centralizer. Product of two subgroups – order of HK – Intersection and union of subgroups.
- Unit II** Cyclic groups – generators of a cyclic group – Number of generators of a cyclic groups – Cosets – Partitioning of a group by Cosets – Lagrange’s theorem – Euler’s theorem – Fermat’s theorem.
- Unit III** **Normal subgroups** : Quotient groups – Group Homomorphis – Canonical homomorphism – kernel of a homomorphism – Isomorphism – Automorphism – Inner automorphism – Permutation groups – Cayley’s theorem.
- Unit IV** **Rings:** Definition and examples – Types of rings – Elementary properties of a ring – Integral domain – Field – Sub rings – Subfields – Ideals – Principal ideal – quotient ring – Maximal and prime ideals - characteristic of a ring – PID – UFD.
- Unit V** Homomorphism of rings – Isomorphism – kernel of a homomorphism – Fundamental theorem – Field of quotients of an integral domain – polynomial rings – Division algorithm

Text Book:

- Arumugam .S and Tangapandi Issac .A – “Modern Algebra”scitech publications Pvt. Ltd.

Books for Reference :

- Anton .H and C. Rorres - Elementary Linear Algebra (9th Edn) John Wiley and Sons, Inc., New York 2005.
- Manicavasagam Pillai .T.K and others – Modern Algebra, S. Viswanathan Publishers, Chennai 1993.
- Herstein .I.N – Topics in Algebra, Vikas Publishing Pvt. Ltd. 1975, New Delhi.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Mathematics) /
Semester-IV/Ppr.no.22(A)/Allied -IV**

(For Mathematics Students)

Statistics – II

- Unit I** Characteristics of index numbers – Laspeyer’s and Paasche’s – Fisher’s and Bowley’s Marshall and Edgeworth’s index numbers – Tests – Unit test, Commodity Reversal test, Time Reversal test, circular test.
- Unit II** Testing of Hypothesis – Null hypothesis and Alternate hypothesis – Type I and Type II errors - Critical Region, Level of significance – Test of significance for large samples – Testing a single proportion – Difference of proportions. Testing a single mean and Difference of means.
- Unit III** Tests based on t-distribution – single mean and Difference of means – Tests based on F-distribution – Variance Ratio test – Tests based on Chi-square Distribution – Independence – Goodness of fit.
- Unit IV** Analysis of variance – one way and two way classified data – Basis of experimental design – Randomized Block Design – Latin square – simple problems.
- Unit V** Statistical Quality control – Definition – Advantages, Process control – Control chart, Mean chart, Range chart, P-chart, Product Control – Sampling Inspection Plans.

Books for Reference :

1. Gupta .S.C & V.K. Kapoor – Fundamentals of Mathematical Statistics – (2002) Sultan Chand & Sons, New Delhi.
2. Vittal .P.R – Mathematical Statistic (2004) – Maragatham Publications
3. DC Sancheti & Kapoor – Statistics
4. M.L. Khanna – Statistics
5. S. Arumugam & others – Statistics

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Mathematics) /
Semester-IV/Ppr.no.22(B)/Allied -IV**

(For Science Students)

Vector Calculus & Fourier Series

- Unit I** Vector differentiation – Gradient – Divergence and curl
- Unit II** Evaluation of double and triple integrals
- Unit III** Vector integration – Line, surface and volume integrals
- Unit IV** Green's, Stokes and Divergence theorems (without proof) – simple problems.
- Unit V** Fourier series – Even and odd functions – Half range Fourier series.

Books for Reference :

1. Dr. S. Arumugam & others – Vector Calculus
2. T.K. Manicavachagom Pillai – Calculus (Vol II)

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Mathematics) /
Semester-IV/Ppr.no.23/Skilled Based -II**

TRIGONOMETRY, LAPLACE TRANSFORMS AND FOURIER SERIES

Unit I Trigonometry : Expansions of $\sin nx$, $\cos nx$, $\tan nx$ and expansions of $\sin^n x$ & $\cos^n x$.

Unit II Hyperbolic functions – Relations between hyperbolic functions and circular functions – Inverse hyperbolic functions – Logarithm of complex numbers – Summation of series by $C + iS$ method.

Unit III Laplace Transforms – Inverse Laplace Transforms.

Unit IV Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms.

Unit V Fourier Series – Definition - Finding Fourier coefficients for a given periodic function with period 2π and $2l$ – Odd and even functions – Half range series.

Text Books:

Arumugam .S and Tangapandi Issac .A -Trigonometry and Fourier Series

Manichavasagam Pillai, T.K., and S. Narayanan-Differential Equations and its Applications

Books for Reference :

- Manichavasagam Pillai, T.K., and S. Narayanan, - Trigonometry, Viswanathan Publishers and Printers Pvt. Ltd.
- Loney - Trigonometry.
- Robert T. Seeley - Fourier Series and Integrals, Dover Publications, New York, 2006.
- Ray Hanna J., - Fourier Series, Transforms and Boundary Value Problems, Dover Publications, New York, 2008.

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) /
Semester-IV/ Ppr.no.24(A)/Non Major Elective –II (A)**

Mathematics for Competitive Examinations -II

Unit I Simple Interest – Compound interest

Unit II Time and work

Unit III Time and distance

Unit IV Chain Rule

Unit V Pipes and Cistern

Books for Reference :

1. Objective Arithmetic – R.S. Aggarwal
2. Descriptive Mathematics - R.S. Aggarwal, Deepak Aggarwal
3. Mathematics for life – M. Immaculate – Nanjil offset Printers

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) /
Semester-IV/Ppr.no.24(B)/Non Major Elective -II (B)**

Fundamentals of Statistics - II

- Unit I** Theory of attributes for two attributes (simple problems)
- Unit II** Characteristics of index numbers – Laspeyer’s and Paasche’s
- Unit III** Bowley’s – Marshall index numbers
- Unit IV** Fisher’s index number – Time Reversal test (Problems only)
- Unit V** Fitting a straight line

Books for Reference :

1. S.P. Gupta – Statistics
2. Dr. S. Arumugam – Statistics
3. M.L. Khanna – Statistics

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

B.Sc. Physics

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem.	Pt. I/II/ III/ IV/ V	Sub No.	Subject status	Subject Title	Hrs./ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	I	17	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	18	Language	English	6	3	25	75	100	30	40
	III	19	Core - 5	ELECTRICITY AND MAGNETISM	4	4	25	75	100	30	40
		20	Practical – III	(Practical List enclosed) (No examination in the third Semester)	2	-	50	50	100	20	40
		21	Allied -III	ALLIED PHYSICS – I	4	4	25	75	100	30	40
		22	Allied Practical-III (No examination in the third Semester)	ALLIED PRACTICALS I & II/III & IV SEMESTERS)	2	-	50	50	100	20	40
	IV	23	Skilled Based subject-I	(A)MAINTANACE OF ELECTRICAL APPLICANCES (or) (B) ASTROPHYSICS	4	4	25	75	100	30	40
	IV	24	Non-Major Elective-I	(A)BASIC PHYSICS - I (OR) (B) ENERGY PHYSICS	2	2	25	75	100	30	40
Sub-total					30	20					

Sem.	Pt. I/II/ III/ IV/V	Sub. No.	Subject status	Subject Title	Hrs. / week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	I	25	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	26	Language	English	6	3	25	75	100	30	40
	III	27	Core - 6	COMPUTER PROGRAMMING IN C++	4	4	25	75	100	30	40
		28	Major Practical- IV	PRACTICAL - II	2	2	50	50	100	20	40
		29	Allied -IV	ALLIED PHYSICS - II	4	4	25	75	100	30	40
		30	Allied Practical- IV	ALLIED PRACTICALS I & II/III & IV SEMESTERS)	2	2	50	50	100	20	40
	IV	31	Skill Based Subject -II	(A)MAINTANACE OF ELECTRONIC APPLIANCES (or) (B)PHYSICS OF HUMAN ANATOMY	4	4	25	75	100	30	40
	IV	32	Non-Major Elective-II	(A)BASIC PHYSICS - II (OR) (B) SPACE PHYSICS	2	2	25	75	100	30	40
	V		Extension Activity	NCC,NSS, YRC, YWF		1					
Subtotal					30	25					

ELECTRICITY AND MAGNETISM

UNIT-I: ELECTRO MAGNETIC INDUCTION

Laws of Electromagnetic Induction - Self induction - Self inductance of a long solenoid - Determination of L Rayleigh's method - Owens bridge - Mutual induction - mutual induction between two co-axial solenoids - Experimental Determination of mutual inductance between a pair of coils - Co efficient of coupling - Energy stored in a coil

UNIT-II: TRANSIENT CURRENT

Growth and decay of current in a circuit containing inductance L and resistance R - Growth and decay of charge in a capacitance - resistance (CR) circuit - Determination of high resistance by leakage - Growth and decay of charge in a LCR circuit - conditions for the discharge to be oscillatory - frequency of oscillation.

UNIT-III: ALTERNATING CURRENT

Alternating Current - j operator method - use of j operator in the study of AC circuits - resistance in an AC circuit - Inductance in an AC circuit - Capacitance in an AC circuit - AC through an inductance and resistance in series - AC through a capacitance and resistance in series - LCR in series resonance circuit - sharpness of resonance - parallel resonance circuit - power in an AC circuit-power factor.

UNIT-IV: THERMO ELECTRICITY

Seebeck effect - thermo emf - neutral temperature - temperature of inversion - Law of thermo electric effects - measurement of emf of a thermocouple with potentiometer - Peltier effect - Thomson effect - Thermodynamics of a thermo couple - Thermo electric power diagram - Application of thermo electric power diagram.

UNIT-V: MAGNETIC FIELDS AND MAXWELL'S EQUATION

The three magnetic vectors M , B , and H - Relation between them - Permeability and Susceptibility - relation between them - moving coil BG - construction - theory - correction for damping - measurement of charge sensitiveness - absolute capacity - De-Saughty's bridge.

Displacement current - Maxwell's equations - Boundary conditions - Poynting vector - Electromagnetic waves in free space - Hertz experiment for production and detection of EM waves.

Books for study

1. Electricity and Magnetism - R. Murugesan (S.Chand &Co.)

Books for Reference

1. Electricity and Magnetism - K.K.Tiwari (S.Chand &Co.)
2. Electrodynamics - David J Griffith
3. Electricity and Magnetism - D.N.Vasudeva (Twelfth revised edition)
4. Fundamentals of Physics, 6th Edition, by D Halliday, R Resnick and J Walker. Wiley NY 2001.
5. Electricity and Magnetism - E.M.Pourcel, Berkley Physics Course, Vol.2 (Mc Graw-Hill)

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)/ Semester-III/Ppr.no.20/
Major Practical – III**

(12 experiments compulsory)

1. Field along the axis of a coil carrying current –deflection magnetometer
2. Potentiometre-calibration of volt meter(low range)
3. Potentiometre-calibration of ammeter
4. Potentiometer-thermo emf
5. Potentiometer-comparison of resistances and specific resistivity
6. Series resonance circuit
7. Parallel resonance circuit
8. Figure of merit-Ballistic Galvanometre
9. Comparison of EMF's and Capacitances- Ballistic Galvanometre
10. Owens bridge
11. De-sauty bridge
12. Carey foster's bridge-temperature co-efficient of resistance
13. Deflection&Vibration Magnetometre-M&B_H
14. Spectrometre-i-d curve
15. Spectrometre-grating-oblique incidence

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)/Semester -III/Ppr.no.21/
Allied – III**

ALLIED PHYSICS -I

Unit I : Elasticity and bending moment

Hooke's law – Elastic moduli – Relation between elastic constants – Work done in stretching a wire – Expression for bending moment - uniform bending- Experiment to determine Young's modulus using pin and microscope-Twisting couple of a wire – Expression for couple per unit twist – Work done in twisting – Experimental determination of rigidity modulus of a wire using Torsion pendulum with theory

Unit II: Surface tension and Viscosity

Surface tension – Definition – Examples – Molecular interpretation – Expression for excess of pressure inside a synclastic and anticlastic surface-Application to spherical and cylindrical drops and bubbles

Viscosity: Coefficient of viscosity – Rate of flow of liquid in a capillary tube (Poisueuille's formula) – Analogy between liquid flow and current flow – Stokes' formula for highly viscous liquids (Dimension method) – Experimental determination of viscosity of highly viscous liquid (stokes' method)

Unit III: Sound: Simple harmonic motion – Free, damped ,forced vibrations and resonance – Composition of two SHMs along a straight line and in perpendicular direction – Melde's string experiment – Determination of frequency of tuning fork(both longitudinal and transverse mode)

Unit IV : Thermal physics : Mean free path- Expression for mean free path (Zero order approximation) – Transport phenomena – Expression for viscosity and thermal conductivity – Conduction in solids – coefficient of thermal conductivity – Lee's disc method to determine thermal conductivity of a bad conductor – Wiedmann – Franz's law – Convection : Newton's law of cooling – Experimental verification – Radiation : Black body radiation – Distribution of energy in black body spectrum – Important features.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)/Semester -III/Ppr.no.21/
Allied – III**

Unit V: Optics

Interference: Condition for interference-Air wedge-determination of thickness of a thin wire by air wedge

Diffraction: Fresnel & Fraunhofer diffraction-Plane diffraction grating- theory and experiment to determine wavelength (normal incidence)

Polarization: Double refraction- half wave and quarter wave plate – Production and detection of plane, elliptically and circularly polarized light.

Books for study

1. Optics – Brijlal & Subramanian
2. Properties of matter – R.Murugesan
3. Heat & Thermodynamics – D.S.Mathur

Reference Books

- 1.Heat and thermodynamics - Brijlal & Subramanian, S Chand & Co., New Delhi
- 2.Fundamentals of Optics by Jenkins A Francis and White E Harvey, McGRaw Hill Inc., New Delhi, 1976.
3. Elements of Properties of Matter by Mathur D S, Shyamlal Charitable Trust, New Delhi, 1993

**MSU/2016-17/UG-Colleges/Part-III (B.Sc.Physics)/Semester -III & IV/Ppr.no.22/
Allied Practicals –III**

ALLIED PHYSICS

LIST OF PRACTICALS

(12 experiments compulsory)

1. Young's modulus- Uniform bending- Microscope
2. Young's modulus - Non-uniform bending- Telescope
3. Rigidity modulus- Torsion pendulum
4. Viscosity of highly viscous liquid- Stokes' method
5. Viscosity- Variable pressure head- graduated burette method
6. Lee's Disc- K of Cardboard
7. Potentiometer- Calibration of voltmeter(low range)
8. Potentiometer- Calibration of ammeter
9. Series resonance circuit
10. Basic logic gates- OR, AND& NOT(using discrete components)
11. Zener diode characteristics
12. Melde's string –frequency of a tuning fork.
13. Spectrometer-refractive index of solid prism
14. Spectrometer- grating- normal incidence method
15. Air wedge- Thickness of wire

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)/Semester-III/Ppr.no.23(A)/
Skilled Based -1(A)**

MAINTANANCE OF ELECTRICAL APPLIANCES

UNIT-I: Resistance - capacitance - inductance and its units - Electrical charge - current - potential - units and measuring meters - Ohm's law - Galvanometer, ammeter, voltmeter and multimeter. Electrical energy - power - watt - kWh - consumption of electrical power.

UNIT-II: Transformer - principle and working - classification of transformers - testing of transformers - Core, Shell and Berry types, auto transformer - construction and uses. Cooling of transformers - Losses in transformer.

Unit-III: Electrical bulbs – Fluorescent lamps - Street Lighting - Electrical Fans - Wet Grinder - Mixer - Water Heater - Storage and Instant types, electric iron box, microwave oven - Washing Machine - Stabilizer, fridge and Air conditioner.

UNIT-IV: AC and DC- Single phase and three phase connections - RMS and peak values, House wiring - Star and delta connection - overloading - earthing - short circuiting - colour code for insulation wires -

UNIT-V: Electrical protection - Relays - Fuses - Electrical switches - Circuit breakers, ELCB - overload devices - ground fault protection - Inverter - UPS - generator and motor

Books for study and Reference

1. A text book in Electrical Technology - B L Theraja - S Chand & Co.
2. A text book of Electrical Technology - A K Theraja
3. Performance and design of AC machines - M G Say ELBS Edn.
4. Semi conductor physics and opto electronics by P K Palanichamy
5. Basic Electronics - B L Theraja - S Chand & Co.
6. Principles of Communication Engineering - Arokh Singh and A K Chhabra - S Chand & Co.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)Semester-III/Ppr.no.23(B)/
Skilled Based - I (B)**

ASTROPHYSICS

UNIT-I : Astronomical instruments

Optical telescope - reflecting telescope - types of reflecting telescope - advantages of reflecting telescope - Radio telescopes - astronomical spectrographs - photographic photometry - photo electric photometry - detectors and image processing.

UNIT-II : Solar system

The sun-physical and orbital data - Photosphere - Chromosphere - corona - solar prominences - sunspot - sunspot cycle - theory of sunspots - solar flare - mass of the sun - solar constant - temperature of the sun - source of solar energy - solar wind. Other members of the solar system - Mercury - Venus - Earth - Mars - Jupiter - Saturn - Uranus - Neptune - Pluto - Moon - Bode's law - Asteroids - comets - Meteors.

UNIT-III: Stellar Evolution, Binary and variable stars

Birth of a star - Death of a star - Chandrasekhar limit - white dwarfs - Neutron stars - black holes - Quasars - Nebulae - Supernovae

Binary stars - Origin of Binary stars. Variable stars - Cepheid variables - RV Tauri variables - long period variables - irregular variables - flare stars.

UNIT-IV : Magnitudes, distance and spectral classification of stars

Magnitude and brightness - apparent magnitude of stars - absolute magnitude of stars - relation between apparent magnitude and absolute magnitude of stars - Luminosities of stars - measurement of stellar distance - Geometrical parallax method - distance from red shift measurement - Harvard system of spectral classification .

UNIT-V :Theories of the universe, galaxies and star clusters

Origin of the universe - the big bang theory - the steady state theory - the oscillating universe theory - Hubble's law.

Galaxies - types of galaxies - Milky Way - star clusters - open clusters - globular clusters.

Books for study and reference:

1. K.S. Krishnasamy, 'Astro Physics a modern perspective,' Reprint, New Age International (p) Ltd, New Delhi,2002.
2. Baidyanath Basu, 'An introduction to Astro physics', second printing, prentice - Hall of India Private limited, New Delhi,2001.
3. R. Murugesan, ' Modern Physics', Eleventh revised edition, S. Chand & Company Ltd, New Delhi, 2003.
4. S. Kumaravelu, 'Astronomy, Janki calendar corporation, Sivakasi, 1993
5. Baker and Fredrick, 'Astronomy, ninth edition, Van No strand Rein hold, Co, New York - 1964.
6. Illustrated World of Science Encyclopedia - Vol I and Vol VIII - Creative world publication - Chicago.

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Physics)/Semester-III/Ppr.no.24(A)/
Non Major Elective – 1 (A)**

BASICPHYSICS - 1

UNIT I : MECHANICS

Motion-speed,velocity,acceleration- force –equations of motion- Newton's laws - momentum - work, power and energy - energy –conservation of energy and momentum.

UNIT II : PROPERTIES OF MATTER

Three states of matter - binding forces - fluid pressure and thrust - applications - Pascal law - Archimedes principle – surface tension-capillary action - Bernoulli's principle – Viscosity-venturimeter-pitot's tube.

UNIT III : HEAT AND SOUND

Measurement of heat and temperature - clinical thermometer - heat transfer - thermos flask - change of state - effect of pressure on boiling point and melting point - heat engines - steam engine and diesel engine. sound and music - reverberation - acoustics of building - recording and reproduction of sound in film.

UNIT IV : OPTICS

Reflection and refraction-Concave and convex mirrors and lenses-dispersion- spectra- rainbow- Interference-diffraction-polarization-concepts with examples-uses-double refraction-optical activity-quartz crystal

UNIT V: ELECTRICITY

Electric field - potential - Ohm's law - electrical energy and power - resistance - types of resistance - fixed resistance - variable resistance.- resistance in series and parallel -Kirchoff's laws

Books for study and Reference:

1. Properties of matter by Murugesan R, S Chand & Co. Pvt. Ltd., New Delhi
2. Text book of sound by Brij Lal & Subramaniam, N Vikas Publishing House, New Delhi, 1982
3. Electricity and Magnetism - R. Murugesan. (S.Chand &Co.)
4. Heat and thermodynamics - Brijlal and Subramaniam, S Chand & Co.
5. Optics by Subramaniam N & Brij Lal, S Chand & Co. Pvt. Ltd., New Delhi,1990

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Physics)/Semester-III/Ppr.no.24(B)/
Non Major Elective – I (B)**

ENERGY PHYSICS

UNIT-I: Conventional energy sources

Conventional energy sources –world’s reserve of Conventional energy sources–various forms of energy-renewable and conventional energy systems-comparison

UNIT-I I: Fossil fuels

Fossil fuels – coal,oil and natural gas-availbility-stastical details-applications-merits and demerits

UNIT-III :Biomass energy

Biomass energy-biomass classification-biomass conversion process-biogas plants-deena bandhu model gas plant-wood gasification-advantages and disadvantages of biomass

UNIT-I V :Renewable energy sources

Renewable energy sources-Solar energy - importance - storage of solar energy - applications of solar energy -solar pond - , solar water heater, solar crop dryers-solar cookers- solar green houses - solar cell

UNIT-V :Geothermal energy

Geothermal energy-Geothermal power plant-wind energy and wind farms- wind mills - types – ocean thermal energy conversion - energy from tides-energy from waves

Books for study and Reference

1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
2. Solar energy - M P Agarwal - S Chand & Co. Ltd.
3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd., New Delhi.

COMPUTER PROGRAMMING IN C⁺⁺

UNIT-I: WHAT IS C⁺⁺

Introduction - tokens - keywords - identifiers and constants - declaration of variables - basic data types - user defined data types-derived data types - symbolic constants - operators in C⁺⁺ - scope resolution operator - expressions and their type - special assignment operators - all control structures.

UNIT-II: FUNCTIONS IN C⁺⁺

Introduction - main function - function prototyping - inline functions - default arguments - function overloading - friendly functions - virtual functions - math library functions.

UNIT-III: CLASSES AND OBJECTS

Introduction - specifying a class - defining member functions-a C⁺⁺ program with class - nesting of member functions - private member functions - objects as function arguments - constructors - parameterized constructors-multiple constructors - constructors with default arguments - copy constructor.

UNIT-IV: OPERATOR OVERLOADING

Introduction - defining Operator overloading - Operator overloading unary operators - overloading binary operators - inheritance - single inheritance - multiple inheritance - multi level inheritance - hybrid inheritance - hierarchial inheritance.

UNIT-V: MANAGING CONSOLE I/O OPERATIONS

Introduction - C⁺⁺ stream - C⁺⁺ stream classes - unformatted I/O Operations -formatted console I/O operations - working with files - classes for file steam operations - opening and closing a file - file pointers and their manipulations.

Books for study

1. Object oriented Programming with C⁺⁺ - E.Balagurusamy, Tata Mc Graw-Hill publishing company Ltd. New Delhi

Books for reference

1. Programming with C⁺⁺ - D.Ravichandran, Tata Mc Graw-Hill publishing company Ltd. New Delhi .
2. Object oriented Programming in C⁺⁺-4th Edn.Robert Lafore-Macmilan publishing company Ltd.
3. Fundamentals of Programming with C⁺⁺ -Richardl.Halterman

PRACTICAL - II (12 experiments compulsory)

1. Field along the axis of a coil carrying current –deflection magnetometer
2. Potentiometre-calibration of volt meter(low range)
3. Potentiometre-calibration of ammeter
4. Potentiometer-thermo emf
5. Potentiometer-comparison of resistances and specific resistivity
6. Series resonance circuit
7. Parallel resonance circuit
8. Figure of merit-Ballistic Galvanometre
9. Comparison of EMF's and Capacitances- Ballistic Galvanometre
10. Owens bridge
11. De-sauty bridge
12. Carey foster's bridge-temperature co-efficient of resistance
13. Deflection & Vibration Magnetometre- M & B_H
14. Spectrometre-i-d curve
15. Spectrometre-grating-oblique incidence

ALLIED PHYSICS –II

Unit I: Electricity

Current and current density – Expression for current density – Ohm's law – Resistors in series and in parallel – I-V characteristic of a resistor – Color coding – Conversion of a galvanometer into an ammeter and voltmeter – Kirchoff's laws – Application of Kirchoff's laws in Wheatstone network – sensitiveness of bridge.

Unit II: Electromagnetism

Magnetism: Definition of magnetic induction B, Magnetic field intensity H , Intensity of magnetization M – Relation connecting M, B and H – Magnetic permeability μ and magnetic susceptibility K – Relation between μ and K – Properties of Dia, Para and Ferro magnetic materials. Electromagnetism: Faraday's law of electromagnetic induction – Lenz's law – Expression for induced current and charge – Self inductance – Self inductance of a long solenoid – Determination of self inductance by Rayleigh's method – Mutual inductance – Coefficient of coupling – Determination of mutual inductance using BG.

Unit III: Electronics

Junction diodes-forward and reverse bias-diode characteristics- Zener diode – VI characteristic of a Zener diode – Transistors-Characteristics of a transistor(common emitter mode only). Digital Electronics: Decimal and binary numbers – binary to decimal and decimal to binary- Binary addition – Binary subtraction by 1's and 2's complement method – Basic logic gates OR, AND, NOT (Symbol, Boolean equation, truth table, circuit and working) – NAND, NOR, EX-OR(Symbol, Boolean equation , truth table only) – De Morgan's theorem.

Unit IV: Nuclear physics

Introduction – Classification of nuclei – General properties of nucleus – Nuclear size, Nuclear mass, Nuclear density, Nuclear charge, Nuclear spin & Nuclear magnetic dipole moments – Mass defect – Binding energy - Binding energy curve – Nuclear forces – Properties – Fundamental laws of radioactivity – Soddy Fajan's displacement law – Law of radioactive disintegration – Half life period – The mean life.

Unit V: Mechanics and Relativity

Projectiles – Time of flight – Range on the horizontal plane – Greatest height attained by the projectile – Path of the projectile– Range on an inclined plane – Relativity: Frames of references – Postulates of special theory of relativity – Galilean & Lorentz transformation equations – Length contraction – Time dilation.

Books for study

1. Electricity and Magnetism – R.Murugesan
2. Modern physics – R. Murugesan
3. Principle of Electronics – V.K.Mehta
4. Digital principles and applications - Albert Paul Malvino & Donald P.Leach
5. Mechanics – D.S.Mathur

Reference Books

- 1.Modern Physics- Seghal Chopra & Seghal, Sultan chand 1998 Electricity and Magneti - K.K.Tiwari (S.Chand &Co.)
- 2.Electronic fundamentals and applications-John D.Ryder –Prentice Hall
3. Electronic principles-Malvino
4. Electricity and Magnetism – Vasudeva

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)/Ppr.no.30/
Allied Practical –III & IV**

LIST OF PRACTICALS

(12 experiments compulsory)

1. Young's modulus- Uniform bending- Microscope
2. Young's modulus - Non-uniform bending- Telescope
3. Rigidity modulus- Torsion pendulum
4. Viscosity of highly viscous liquid- Stokes' method
5. Viscosity- Variable pressure head- graduated burette method
6. Lee's Disc- K of Cardboard
7. Potentiometer- Calibration of voltmeter(low range)
8. Potentiometer- Calibration of ammeter
9. Series resonance circuit

10. Basic logic gates- OR, AND& NOT(using discrete components)
11. Zener diode characteristics
12. Melde's string –frequency of a tuning fork.
13. Spectrometer-refractive index of solid prism
14. Spectrometer- grating- normal incidence method
15. Air wedge- Thickness of wire

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics/Semester-IV/Ppr.no.31(A)/
Skilled Based – II (A)**

MAINTANANCE OF ELECTRONIC EQUIPMENTS

UNIT-I : Electronic components

Study of Electronic components - Resistors - types - characteristics - colour coding – wattage rating-potential divider arrangement-capacitors - type - characteristics —working voltage-star and delta connection of resistors and capacitors - Soldering and desoldering techniques-Groove board,bread board and printed circuit board

UNIT-II :Measuring Instruments

Practical use of Multimeter (analog and digital) - CRO - Block Diagram -measurement of voltage, frequency and phase - waveforms and Lissajoue’s figures. Digital Storage Oscilloscopes-LCD display for instruments -A/F and R/F oscillators.

UNIT-III :Transducers

Classification of transducers, Basic requirement/characteristics of transducers, Active andPassive transducers, Resistive (Potentiometer -Theory, temperature compensation &applications), Capacitive (variable air gap type), Inductive (LVDT) &piezoelectric transducers. Measurement of temperature (RTD, semiconductor IC sensors), Light transducers (photo resistors &photovoltaic cells).

UNIT-IV:Communication Devices

Basic concepts of radio transmitter and receiver - TV antennas: Resonance antennas and their characteristics - Dipole antenna - Folded dipole - Yagi antenna - Yagi antenna design - Dish antenna - DTH system - Mobile communication system - MODEM.

Telephone systems-cellular Telephone systems-mobile phone-principle of operation-integrated services=digital networks(ISDN)

UNIT-V: Photography

Introduction to cameras-parts of camera and accessories—lens shutter-aperture-flash photography-filters-battery-tele and wide angle lens

Digital formats-data transfer to computer-ISO speed-resolution

Books for Study and Reference

1. Principles of Electronics by V K Mehta, S Chand & Co., 5th edition 2001.
2. Functional Electronics by Ramanan.
3. Elements of Electronics by Bagde and Singh
4. Basic Electronics, 6th edition by B Grob, McGraw Hill NY 1
5. Electronic principles-Malvino 6th edition
6. Basic electronics-B.Basavaraj,H.N.Shivasankar-Universities press

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)/Semester-IV/Ppr.no.31(B)/
Skilled Based - II (B)**

PHYSICS OF HUMAN ANATOMY

Unit – 1:Physics light and its medical application to Human body

Properties of light – Measurement of Light – Energy of light – medical Application of Visible light, UV, IR and Laser in Human body.

Unit – 2:Physics of Breathing:

Pressure – Typical pressure in Normal body – Gas transport in respiratory system – Definition of pressure-Volume in Lung-Thorax system – Resistance of air passage – Timing of breathing process – Work required for Breathing

Unit – 3:Energy of Human body

Heat loss of the body due to conduction, convection, evaporation, radiation- Wind chill – Mechanism to decrease body temperature – Medical implication of high temperature.

Unit – 4:The Acoustics of Body

Sound – unit – wave equation – Unit of sound intensities for auditory system – production of speech – Physics of ear – outer Ear – inner Ear – Ear drum – Middle Ear

Unit – 5:Physics of Eye

Optical system of the body structure of Eye – Refraction focussing of the eye system – Geometrical optics of the Eye – Structure of receptor system – Diffraction effects of Eye – Eye defects.

References:

1. web.khu.ac.kr/~bil/lecture/MedicalPhysics/Ch14.PDF
2. http://www.edb.utexas.edu/petrosino/Legacy_Cycle/mf_jm/Challenge2/physicsbreathing.pdf
3. <http://web.khu.ac.kr/~bil/lecture/MedicalPhysics/Ch8.PDF>

4. <https://www3.nd.edu/~nsl/Lectures/mphysics/Medical%20Physics/Part%20I.%20Physics%20of%20the%20Body/Chapter%203.%20Pressure%20System%20of%20the%20Body/Chapter%203.%20Pressure%20System%20of%20the%20Body.pdf>
5. <https://www3.nd.edu/~nsl/Lectures/mphysics/Medical%20Physics/Part%20I.%20Physics%20of%20the%20Body/Chapter%204.%20Acoustics%20of%20the%20Body/Chapter%204.%20Acoustics%20of%20the%20Body.pdf>
6. <https://www3.nd.edu/~nsl/Lectures/mphysics/Medical%20Physics/Part%20I.%20Physics%20of%20the%20Body/Chapter%205.%20Optical%20System%20of%20the%20Body/Chapter%205.%20Optical%20System%20of%20the%20Body.pdf>
7. <https://www3.nd.edu/~nsl/Lectures/mphysics/Medical%20Physics/Part%20I.%20Physics%20of%20the%20Body/Chapter%202.%20Energy%20Household%20of%20the%20Body/2.3%20Heat%20losses%20of%20the%20body/Heat%20losses%20of%20the%20body.pdf>
8. <https://www3.nd.edu/~nsl/Lectures/mphysics/Medical%20Physics>

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Physics)/Semester-IV/
Ppr.no.32 (A) /Non Major Elective – II (A)**

BASICPHYSICS - II

UNIT I: Nuclear Physics

Introduction-nuclear structure-properties of nucleus-packing fraction-binding energy-nuclear forces- Radio activity-properties of alpha,beta and gamma rays-radio carbon dating-nuclear fission-nuclear fusion

UNIT II: Magnetic Materials

Classification Of Magnetic Materials-para-dia and ferromagnetic materials-crystalline and amorphous materials-conductors-insulators-superconductors

UNIT III Laser

Introduction-absorption-spontaneous emission-stimulated emission-population inversion-a general laser system-He-Ne laser-applications

UNIT IV Relativity

Introduction -reference frames-postulates of the special theory of relativity-length contraction-time dilation(no derivation)

Quantum mechanics-dual nature of wave and radiation-de-broglie waves-

UNIT V

Number systems in digital electronics-binary ,decimal and hexadecimal numbers – interconversions- binary addition and subtraction—binary coded decimal-logic gates

Books for study and Reference

1. Modern Physics- R.Murugesan, S. chand & Co
2. Electricity and Magnetism -R. Murugesan (S.Chand &Co.)
3. Digital principles and applications - Albert Paul Malvino & Donald P.Leach
4. Mechanics and mathematical physics- R.Murugesan-S Chand & Co. Pvt. Ltd., New Delhi

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Physics)/Semester-IV/Ppr.no.32(B)/
Non Major Elective – II (B)**

SPACE PHYSICS

UNIT I : Universe

Planets - interior planets - exterior planets - crust, mantle and core of the earth - different - region of earth's atmosphere - rotation of the earth - magnetosphere - Van Allen belts - Aurora.

UNIT II : Comets, Meteors, Asteroids

Composition and structure of comets - periodic comets - salient features of asteroids, meteors and its use.

UNIT III : Sun

Structure of photosphere, chromosphere, corona - sunspots - solar flares - solar prominences - solar piages - satellites of planets - structure, phases and their features of moon.

UNIT IV : Stars

Constellations - binary stars - their origin and types star clusters – globular clusters - types of variable stars - types of galaxies.

UNIT V: Origin of Universe

Big bang theory - pulsating theory - steady state theory - composition of universe expansion

Books for study and Reference

1. K.D. Abyankar, Astrophysics of the solar system, University press, India.
2. Baidyanath Basu, An introduction to Astrophysics, Prentice Hall of India, New Delhi.
3. Prof. P. Devadas, The fascinating Astronomy, Published by Devadas Telescopies, 2, Charkrapani Road, Guindy, Chennai.
4. Elements of Space Physics – R.P. Singhal, PHI.

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

B.Sc. Plant Biology and Plant Biology

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem.	Pt. I/II/ III/ IV/ V	Sub No.	Subject status	Subject Title	Hrs./ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	I	17	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	18	Language	English	6	3	25	75	100	30	40
	III	19	Core - 5	PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY	4	4	25	75	100	30	40
		20	Practical – Core Paper V	PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY	2	-	50	50	100	20	40
		21	Allied -III	PLANT DIVERSITY AND MEDICINAL BOTANY	4	4	25	75	100	30	40
		22	Allied Practical-III	PRACTICAL (List enclosed)	2	-	50	50	100	20	40
	IV	23	Skilled Based subject-I	(A)MUSHROOM CULTIVATION (OR) (B)ORGANIC FARMING	4	4	25	75	100	30	40
	IV	24	Non-Major Elective-I	(A)GARDENING AND GARDEN MANAGEMENT (OR) HERBAL MEDICINE	2	2	25	75	100	30	40
Subtotal					30	20					

Sem.	Pt. I/II/ III/ IV/V	Sub. No.	Subject status	Subject Title	Hrs. / week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	I	25	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	26	Language	English	6	3	25	75	100	30	40
	III	27	Core - 6	MICROBIOLOGY & TECHNIQUES IN BIOLOGY	4	4	25	75	100	30	40
		28	Major Practical- IV	MICROBIOLOGY & TECHNIQUES IN BIOLOGY	2	2	50	50	100	20	40
		29	Allied -IV	PLANT BIOLOGY AND PLANT BIOTECHNOLOGY	4	4	25	75	100	30	40
		30	Allied Practical- IV	PRACTICAL (list enclosed)	2	2	50	50	100	20	40
	IV	31	Skill Based Subject -II	(A)FLORICULTURE (OR) (B) PRESERVATION OF FRUITS AND VEGETABLES	4	4	25	75	100	30	40
	IV	32	Non-Major Elective-II	(A)FOOD & NUTRITION (OR) (B) BOTANY FOR COMPETITIVE EXAMINATIONS	2	2	25	75	100	30	40
	V		Extension Activity	NCC,NSS, YRC, YWF		1					
Subtotal					30	25					

**MSU/2016-17/UG –Colleges / Part III (B. Sc Plant Biology & Plant Biotech)/
Semester -III/ Ppr.no.19/Core-5**

PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY

UNIT I

General Characteristics and Classification of Pteridophytes (Smith, 1951); Distribution, Systematic Position, Structure, Reproduction and Life History (need not study the development of gametophyte, sex organs and sporophyte) of *Psilotum* and *Lycopodium*.

UNIT II

Occurrence, Systematic Position, Structure, Reproduction and Life Cycle of *Gleichenia*, *Marsilea*; (need not study the development of gametophytes, sex organ and sporophyte) ; Stellar Evolution in Pteridophytes.

UNIT III

General Characteristics and Classification of Gymnosperms (Chamberlain, 1934); Distribution, Systematic Position, Structure, Reproduction and Life History of *Pinus*.

UNIT IV

Occurrence, Systematic Position, Structure, Reproduction and Life Cycle of *Gnetum* (need not study the Development of Sex Organs and Sporophyte). Economic Importance of Gymnosperms.

UNIT V

Paleobotany: Geological Time Scale, Methods of Fossilization; Brief Study of *Rhynia*, *Lepidodendron* and *Lyginopteris*.

**MSU/2016-17/UG-Colleges/ Part III (B. Sc Plant Biology & Plant Biotech)/ Semester -III/
Ppr.no.20/ Core- Practical – III**

1. To make suitable micro preparations of the following:

Lycopodium stem,
Gleichenia Stem,
Marsilea Petiole, Rhizome and Sporocarp.
Pinus Stem and Needle
Gnetum Stem and Leaf.

2. To observe and identify Specimens and Microslides.

Pteridophytes: *Psilotum* Habit,

Psilotum - Stem T.S;
Psilotum Synangium L.S and C.S;
Lycopodium cone L.S,
Gleichenia habit,

Gymnosperms: *Pinus* -Male and Female Cone (Specimen),

Pinus -L.S of Male and Female Cone (Slide)
Gnetum – Male and Female Cone (Specimen)
L.S. of Male and Female Cone (Slide),
Gnetum- L.S of Ovule.

Paleobotany (Slide)

Rhynia stem
Lepidodendron stem
Lyginopteris stem.

3. Maintain a Record Notebook for External and Internal Evaluation.

References :

1. Arnold, C.A. 1947. An introduction to Palaeobotany. McGraw Hill Co. Ltd., New Delhi.
2. Chamberlain, C.A. 1986. Gymnosperms-Structure and Evolution, Publishers & Distributors.
3. Pandey, S.N. 1995. A Textbook of Pteridophyta. Vikas Publishing House, Ghaziabad.
4. Shukhla, A.C. and Misra, P. 1982. Essentials of Paleobotany, Vikas Publishing House Pvt. Ltd., Ghaziabad.
5. Smith, G.M. 1955. Cryptogamic Botany. Vol. III. McGraw Hill Co.
6. Sporne, K.R. 1976. Morphology of Pteridophytes. B.I. Publishers, New Delhi.
7. Vashista, P.C. 1971. Botany for Degree students: Pteridophyta. S. Chand & Co., New Delhi.
8. Vashista, P.C. 1978. Botany for degree students: Gymnosperms. S. Chand & Co., New Delhi

PLANT DIVERSITY AND MEDICINAL BOTANY

UNIT I

General Characteristics of Algae – Distribution, Structure and Life History of Volvox. General Characteristics of Fungi – Distribution, Structure and Life History of Polyporus - Economic Importance of Algae and Fungi.

UNIT II

General Characteristics of Lichens; Structure and Reproduction of Usnea. General Characteristics of Bryophytes; Structure and Reproduction of *Funaria*.

UNIT III

General Characters of Pteridophytes - Structure and Reproduction of *Lycopodium*; General Characters of Gymnosperms – Structure and Reproduction of Pinus; Economic Importance of Pteridophytes and Gymnosperms.

UNIT IV

Plant Nomenclature – Bentham and Hooker’s System of Classification, Merits and Demerits of Bentham Hooker’s system; Critical study of the following Families and their Economic importance - Rutaceae, Asclepiadaceae, Euphorbiaceae and Poaceae.

UNIT – V

Study of the Following Plants with Reference to the Morphology, Useful Parts and their Medicinal Importance. *Aloe vera*, *Piper nigrum*, *Phyllanthus niruri*, *Coleus amboinicus*, *Catharanthus roseus*, *Gymnema sylvestre*.

MSU/2016-17/UG-Colleges / Part III (B. Sc Plant Biology & Plant Biotech)/

Semester -III/ Ppr.no.22/ Allied Practical - III

1. Technical description of Plant parts with reference to the families prescribed in the syllabus.
2. Dissection of floral parts of plants belong to the families prescribed in the syllabus.
3. Make suitable Micro preparations of
 - a. Dicot stem,
 - b. Monocot stem,
 - c. Dicot root,
 - d. monocot root,
 - e. Lycopodium stem,
 - f. Pinus needle.
4. To identify and to record the medicinal values and morphology of the useful parts of the plants prescribed in the syllabus.
5. To identify the slides showing
 - a. Mature anther,
 - b. Ovule,
 - c. Dicot embryo,
 - d. Volvox,
 - e. Nostoc,
 - f. Yeast,
 - g. *Lycopodium* cone L.S and
 - h. *Funaria* capsule L.S.
6. To identify the following specimens
 - a. *Polyporus*,
 - b. *Funaria*,
 - c. *Lycopodium* and
 - d. *Pinus* –male and female cone.
7. Demonstration experiment
 - a. Ganong's light screen,
 - b. Bell jar experiment and
 - c. Suction due to Transpiration.
8. Photograph – Callus culture, Meristem culture.
9. To maintain a record note book for external and internal evaluation.

**MSU/2016-17/ B. Sc Plant Biology & Plant Biotech / Semester –III / Ppr.no.23(A) /
Skill Based Subject - I (A)**

MUSHROOM CULTIVATION

UNIT I

Introduction – Morphology, Identification of Edible and Poisonous Mushroom, Medicinal Mushrooms – Structure and Life cycle of Edible Mushroom-Oyster Mushroom (*Pleurotus* species), Prospects of Mushroom Cultivation in Small Scale Industry.

Unit – II

Pure culture – Preparation of Medium (PDA and Oatmeal Agar Medium) Sterilization – Preparation of Test Tube Slants to Store Mother Culture – Culturing of *Pleurotus* mycelium on Petri Plates, Preparation of Mother Spawn in Saline Bottle and Polypropylene Bag and their Multiplication.

Unit - III

Cultivation of Mushrooms -Infrastructure- substrates (locally available) Polythene bag, Mushroom bed preparation - Factors affecting the Mushroom Bed Preparation, Spawn Running and Harvesting of Mushrooms - Button mushroom (*Agaricus bisporus*), Oyster Mushroom (*Pleurotus sp.*) and Paddy Straw Mushroom (*Volvariella* asp.)

Unit IV

Post Harvesting Technology of Mushrooms, Farm Design and Protection of Mushrooms from Pests and Diseases. Nutritional Value – Proteins, Amino Acids, Mineral Elements, Carbohydrates, Fibre content, Vitamins; Significance of Mushrooms.

Unit - V

Storage and Value Added Products : Short-Term Storage (Refrigeration – upto 24 hours) Long Term Storage (Canning, Pickles, Papads), Drying, Storage in Salt Solutions, Value Added Food Preparation – Types of Food Prepared from Mushroom; Soup, Cutlet, Omelette, Samosa, Pickles, Curry.

Demonstration:

1. Identification of edible mushrooms.
2. Cultivation of Paddy Straw Mushroom.
3. Preparation of recipes.
4. Maintain an Observation Notebook

References

1. Chang, S. T. and W. A. Hayes (1978) *The Biology and Cultivation of Edible Mushrooms*, Academic Press. New York
2. Chang S.T. and P.G. Miles 2004. *Mushrooms: Cultivation, Nutritional Value, Medicinal effect and Environmental Impact (II Edition)*. CRC Press.
3. Marimuthu, T. Krishnamoorthy, A.S. Sivaprakasam, K. and Jayarajan. R. 1991. *Oyster Mushrooms*, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.
4. Nita Bahl. 2002. *Handbook of Mushrooms*. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
5. Phillips, Roger (2006) *Mushrooms*. Pub. McMillan, Publications
6. Savoie JM, Callac P, Foulongne-Oriol M (2012) *Mushroom Biotechnology and Bioengineering*, CD Press Publishing House. Bucharest, Romania, Eds: M. Petre& M. Berovic,
7. Sohl, H.S. 1988. *Mushroom – Exciting Commercial Prospects*. The Hindu Survey of Indian Agriculture.
8. Suman, B.C., V.P. Sharma 2007. *Mushroom Cultivation in India* :Daya Publication House.
9. Swaminathan, M. 1990. *Food and Nutrition*. Bappco, The Bangalore, Printing and Publishing Co. Ltd., No. 88, Mysore Road, Bangalore.
10. Tewari, Pankaj Kapoor, S.C., 1988. *Mushroom Cultivation* Mittal Publications, Delhi.

**MSU/2016-17/B. Sc Plant Biology & Plant Biotech/ Semester -III/Ppr.no.23(B) /
Skill Based Subject – I (B)**

ORGANIC FARMING

Unit I

Soil Science, Brief Account of Soil Profile; Fertility of Soil – Importance of Organic Matter – Water Retentivity and Aeration of Soil.

Unit II

Organic Manure, Types, Animal Wastes – Cattle Dung, Urine, Poultry Wastes, Slaughter Wastes, Piggery and Fishery Wastes.

Unit III

Plant wastes – Fallen leaves and Twigs – Humus Formation, Green Manuring – Mulching – Leaves of Trees like *Pongamia*, *Gliricidia*, *Azadirachta*, *Calotropis* – Compost making.

Unit IV

Biofertilizers: Rhizobium-Importance, Mass Production and Application, VAM Fungi - Mass production and Applications.

Unit – V

Vermicomposting – Importance, Application and Production of Vermicompost; Preparation and importance of Panchagavya foliar spray.

Demonstration:

1. Soil Profile
2. Capillarity of Different kinds of Soil.
3. Vermicomposting
4. Preparation of Organic Manure
5. Identification of the following plants:
 - a. *Pongamia*,
 - b. *Gliricidia*
 - c. *Azadirachta* and
 - d. *Calotropis*.

1. Maintain an Observation Notebook.

References:

1. Dubey, R.C. 2006, A Text Book of Biotechnology, S. Chand and Company Ltd. New Delhi.
2. ICAR, 1980. Hand Book of Agriculture, Indian Council of Agricultural Research, New Delhi.
3. John Jothi Prakash, E. 2006. Outlines of Biotechnology. Emkay Publications, New Delhi.
4. Mark Coyne, 2004. Soil Microbiology- An Exploratory Approach. Delmar Publishers, Singapore.
5. Miller, C.E. and Turk, L.M. 2002. Fundamentals of Soil Science. Biotech Books, New Delhi.

**MSU/2016-17/B. Sc Plant Biology & Plant Biotech/ Semester -III/Ppr.no.24 (A)/
Non-Major Elective I - (A)**

GARDENING AND GARDEN MANAGEMENT

Unit I

Principles of Ornamental Gardening – Types – Formal & informal Gardens – English Gardens, Mughal Gardens, Japanese Gardens.

Unit II

Propagation Techniques – Soft Wood Cutting, Simple and Air Layering, ‘T’ Budding, Approach Grafting, Pruning, Garden Implements – Digger, Pruning Shears, Garden Rake.

Unit III

Components of Ornamental Gardens – Hedges, Edges, Flower Beds, Arches, Rockery, Lawn and Topiary.

Unit IV

Vegetable Gardening – Types, Establishment of Kitchen Garden, Components of Kitchen Garden – Perennials, Pandals, Fence, Seasonal Vegetable Crops in bunds, Compost Pits.

Unit V

Indoor Gardening – Principles and Maintenance. Hanging baskets, Terrarium, Bottle Garden and Bonsai.

**MSU/2016-17/B. Sc Plant Biology & Plant Biotech/ Semester -III/ Ppr.no.24(B)/
Non-Major Elective –I (B)**

HERBAL MEDICINE

UNIT: I

Indian systems of medicine – Ayurveda, Siddha, Unani and Homeopathy. TBK (Tribal Botanical knowledge): Folk medicines, including Home remedies. Ethno medicines of Tamil Nadu.

UNIT: II

Herbal remedies for common ailments like cold, fever, diabetes, cuts, diarrhoea.

UNIT: III

Study on the morphology, useful parts, uses and method of use for specific ailments: rhizome (*Acorus*, Ginger), Bulb (Garlic, Onion), Root (*Hemidesmus*, *Vinca*), Bark (*Saracaindica*, *Cinnamomum*), Leaf (*Adhatoda*, *Vitex*), Flower (Cassia, Clove), Whole plant (*Phyllanthus*,Neem)).

UNIT: IV

Skin and hair care using herbals. Herbal preparation: decoction, extract, infusions, oils, shampoos, powders.

UNIT: V

Cultivation, harvest and post-harvest technology of some medicinal plants –*Catharanthusroseus*, *Adhatodavasica*, *Acoruscalamus*.

REFERENCES:

1. Aruna Devaraj, 2002. Herbal cosmetology.
2. Gala, D.R. Dhiren Gala & Sanjay Gala. 2000. Nature cure for common diseases, Navneet Publications Ltd., Mumbai.
3. Kirtikar K.R. and Basu, B.D. 1991. Indian Medicinal Plants Vol.1-4, Periodical Experts, New Delhi.
4. Saha, M.N. 1997. Fruit and Vegetable juice therapy, Jain Publishers-New Delhi.
5. Vaidya Bhagwan Dush, B. 1999. Herbal cure, Jain Publishers-New Delhi.

MICROBIOLOGY AND TECHNIQUES IN BIOLOGY

UNIT I

Brief History and Development of Microbiology, Classification of Microorganisms (Whittaker's Five Kingdom Concept), Bacteria - Outline of Bacterial Classification (Bergey's manual); Ultra Structure, Nutritional Types and Reproduction of Bacteria, Media Preparation and Pure Culture Techniques of Bacteria; Staining Technique – Gram – Staining.

UNIT II

Viruses: General Characteristics, Structure and Reproduction of HIV, T₄ Bacteriophages, Viroids, Virions and Mycoplasma; Transmission of Viruses and Purification of Viruses.

UNIT III

Microbes in Food Production, Spoilage, Poisoning and Preservation. Bacteria Flora in Milk, Pasteurization of Milk and Milk Products; Bacterial Pathogens and Water Pollution; Drinking Water as a Vehicle of Diseases; Purification of water.

UNIT IV

Methods of Direct Gene Transfer – Ultrasonication, Electroporation, Liposome Mediated Gene Transfer. Microscopy - Principles and Applications of Light and Dark field; Electron Microscope (Scanning and Transmission Electron Microscopy; Phase contrast, Fluorescence, Polarization; Camera Lucida.

UNIT V

Identification of Recombinants – Insertional inactivation, Immunochemical Method and Colony Hybridization Technique, Selection of Recombinant using Selective Medium and reporter genes. Blotting Techniques – Southern, Northern and Western Blotting.

**MSU/2016-17/UG-Colleges /Part III (B. Sc Plant Biology & Plant Biotech)/
Semester -IV/ Ppr.no.28/Core Practical - IV**

PRACTICALS

1. Preparation of Culture Media for Bacteria.
2. Demonstration of Preparation of Serial Dilution and Isolation of Pure Culture from Soil.
3. Procedure for Gram Staining and identify the type of Bacteria.
4. Demonstration of Analysis of Milk – Methylene Blue Dye Reduction Test.
5. **Spotters:**
 - i. Ultra Structure of Bacterial Cell,
 - ii. T₄ Phage and
 - iii. HIV Virus,
 - iv. Autoclave,
 - v. Laminar Air Flow Chamber,
 - vi. Hot Air Oven,
 - vii. Inoculation Needle,
 - viii. Agar Medium,
 - ix. Streak Plate Method,
 - x. Spoiled Food.
 - xi. Liposome Mediated Gene Transfer in Plants,
 - xii. Colony Hybridization Technique,
 - xiii. Blotting Techniques – Southern, Northern and Western.Blotting.
6. Maintain a Record Notebook for External and Internal Evaluation.\

References:

1. Anantharayan, R. and C.K.J. Paniker, 2000. Text book of Microbiology, 6th Edition. Orient Longman.
2. Atlas, R.M. 1989. Microbiology-Fundamentals and applications.McMillan Publishing Company, New York.
3. Dubey, R.C.1993. A Text book of Bio-Technology. S. Chand & Co. Ltd. New Delhi.
4. Dwivedi, J. N. and Singh, R. B. (1985). Essential of Plant Technique Scientific Publications, Jodhpur.
5. Kumar, H.D.1993. A Text book of Bio-Technology. East West Affiliated Press Ltd., New Delhi.
6. Pelczar, Michel J. JR., E.C.S. Chan and Noel R. Krieg (Eds.) Textbook of Microbiology. Tata McGraw Hill. Co. New Delhi.
7. Rao, A.S. 2009. Introduction to Microbiology. PHI Learning Pvt. Ltd. New Delhi.
8. Skoog, A. and West, M. (1980). Principles of Instrumental Analysis – W. B. Saunders Co., Philadelphia, USA.
9. Srivastava ,H.S. An Introduction to Bio-Technology. Rastogi Publishing Company Meerut.

EMBRYOLOGY, PLANT ANATOMY, PHYSIOLOGY AND BIOTECHNOLOGY

UNIT – I

Structure and Development of Microsporangium; Structure, Types and Development of Megasporangium; Development of Male and Female Gametophyte; Double Fertilization; Endosperm – Types; Structure of Dicot Embryo.

UNIT – II

Tissues – Simple Tissues, Complex Tissues; Primary Structure of Dicot and Monocot stem; Dicot and Monocot Root; Normal Secondary thickening in Dicot Stem.

UNIT – III

Absorption of Water – Diffusion, Osmosis, imbibition; Mechanism of Absorption of Water - Mechanism; Ascent of sap – Cohesion Theory; Transpiration – Types, structure of stomata, Mechanism of Stomatal Transpiration (Starch – Sugar Hypothesis); Photosynthesis – Structure of Chloroplast, Importance of Photosynthesis, Mechanism of Photosynthesis – Light and Dark Reaction (Calvin cycle).

UNIT – IV

Algal Biotechnology: Nostoc - Morphology, Use as Biofertilizer and Mass cultivation; Fungal Biotechnology :Structure and Multiplication (Budding and Fission) of Yeast, Mass Culture and Uses.

UNIT – V

Tissue Culture – Scope and Importance - Totipotency, Nutrient Medium (M.S medium) Callus Culture, Meristem Culture and their Applications.

MSU/2016-17/UG-Colleges /Part III (B. Sc Plant Biology & Plant Biotech) /

Semester -III/ Ppr.no.30/Allied Practical - IV

1. Technical description of Plant parts with reference to the families prescribed in the syllabus.
2. Dissection of floral parts of plants belong to the families prescribed in the syllabus.
3. Make suitable Micro preparations of
 - a. Dicot stem,
 - b. Monocot stem,
 - c. Dicot root,
 - d. monocot root,
 - e. Lycopodium stem,
 - f. Pinus needle.
4. To identify and to record the medicinal values and morphology of the useful parts of the plants prescribed in the syllabus.
5. To identify the slides showing
 - i. Mature anther,
 - j. Ovule,
 - k. Dicot embryo,
 - l. Volvox,
 - m. Nostoc,
 - n. Yeast,
 - o. *Lycopodium* cone L.S and
 - p. *Funaria* capsule L.S.
6. To identify the following specimens
 - a. *Polyporus*,
 - b. *Funaria*,
 - c. *Lycopodium* and
 - d. *Pinus* –male and female cone.
7. Demonstration experiment
 - a. Ganong's light screen,
 - b. Bell jar experiment and
 - c. Suction due to Transpiration.
8. Photograph – Callus culture, Meristem culture.
9. To maintain a record note book for external and internal evaluation.

**MSU/2016-17/UG – Colleges / Part III (B. Sc Plant Biology & Plant Biotech)/
Semester -IV/ Ppr.no.31(A)/ Skill Based Subject – II (A)**

FLORICULTURE

UNIT I

Importance of floriculture – Cut flowers – Chrysanthemum, Tulips, Lavendula, Gerbera, Gladiolus and Helichrysum.

UNIT II

CommercialFloriculture - Definition. – Cultivation of Calendula, Polyanthus and Marigold.

UNIT III

Cultivation of Anthurium, Orchids, Cut flower production, Package and export

UNIT IV

Importance of flowers in Perfumery - Extraction of Rose and Jasmine oil and their products.

UNIT V

Flower arrangement – General Principles of Flower Arrangement; Western and Japanese; Dry flower Decorations.

References:

1. Edmond, J.B., Senn, T.L., Andrews, F.S. and Hal force, R.G. 1990. Fundamentals of Horticulture. Tata McGraw Hill Pvt. Co., London.
2. Kumar N. 2010. An introduction to Horticulture, Narosa Pub., New Delhi
3. Randhawa., G.S. 1973. Ornamental Horticulture in India. Today and Tomorrow Printers and Publishers, New Delhi.
4. Vishnu Swarap. 1997. Garden flowers. National Book Trust, India.

**MSU/2016-17/UG- Colleges/ Part III (B. Sc Plant Biology & Plant Biotech)/
Semester -IV/Ppr.no.31(B) / Skill Based Subject –II (B)**

PRESERVATION OF FRUITS AND VEGETABLES

Unit-I : Fruits and Vegetables- nutritive values, factors affecting storage, spoilage: microbial, enzymatic and insects.

Unit-II : Principles of Preservation; Importance and Methods of Preservation - Refrigeration, Freezing, Canning, Drying and Dehydration, Chemical preservatives.

Unit- III: Methods of preparation of the following: Fruit Juice- Grape; Squashes- Orange and Pine apple; Jam - Tomato and Mixed Fruit ; Jellies- Guava.

Unit- IV: Preparation of Chutney- Mango; Sauce - Tomato; Pickles- Lime, Mango and Garlic; Ketchup- Tomato. Drying of fruits: Banana, Mango, Grapes and Fig.

Unit- V: Canning of Fruits- Mango and Banana; Canning of Vegetables- Tomato, Carrot, Bean and Mushrooms.

Demonstration:

1. Preparation of Jams, Fruit juice, Squash, Sauces, Pickles and Ketchup.
2. Visit to stations doing these preparations/ fruit farms to learn the preservation of fruits and vegetables.
3. Maintain an Observation Notebook.

References

1. Alex V. Ramani, 2009. Food Chemistry, MPJ Publishers, Chennai
1. Cruess, W.V. 1948. Commercial Fruit and Vegetable products, McGraw Hill Book Company Inc., New York.
2. Kulshrestha, S.K. 1994. Food Preservation, Vikas Publishing House, New Delhi.
3. Swaminathan, M. 1992. Hand Book of Food Science and Experimental Foods, Bangalore printing and publishing Co. Ltd., Bangalore.
4. Siva Sankar, B. 2007. Food Process and Preservation, Prentice Hall of India Private Ltd.
5. Kumar N. 2010. An introduction to Horticulture, Narosa Pub. New Delhi.
6. Swamynathan, M. 2008. Advanced Text Book on Food and Nutrition Vol. 2, Bangalore Printing Publishing Co. Ltd. Bangalore.
7. GirdhariLal, G.S. Siddappaa and Tandon, G.L. 1986. Preservation of Fruits and Vegetables. Publications and Information Division, ICAR, New Delhi.
8. Usha Rani, C.K. and Mary Christi, R. 2010. Preservation of fruits and vegetables. Sheen Grafix, Nagercoil.

MSU/2016-17/UG-Colleges / Part IV (B. Sc Plant Biology & Plant Biotech)/

Semester -IV/Ppr.no.32(A)/Non-Major Elective –II (A)

FOOD AND NUTRITION

UNIT:I

Energy Value of Food, Major Classes of Food- Carbohydrates, Proteins, Fats and Oils, Vitamins, Minerals – Sources and Requirements. Balanced Diet - Functions and Deficiency Symptoms – Causes and Prevention.

UNIT: II

Plants as Source of Food-Nutritive Value of Cereals and Millets (Rice, Wheat, Maize, Sorghum, and Ragi); Pulses (Bengal gram, Black gram, Green gram, Red gram and Peas); Nuts and Oil seeds (Ground nuts, Sesame, Coconut, Soyabeans, Sunflower); Fruits and Vegetables (Mango, Banana, Guava, Pomegranate, Grapes, Cucumber, Brinjal, Ladies finger, Tomato, Carrot).

UNIT: III

Food Preservation: Importance of Preservation. Methods of Preservation. Low and High Temperatures, Uses of Oil and Spices, Use of Salt and Sugar. Preparation of Jam, Jelly, Pickles and Squashes.

UNIT: IV

Food Additives: Definition and Types. Food Poisoning- Salmonellosis, Botulism. Food Adulteration- Harmful Effects, Simple Physical Tests for Detection of Food Adulterants.

UNIT: V

Food Borne Infection and their Prevention - Cholera, Typhoid.

REFERENCES:

1. Sumathi, Madamti R. & Rajagopal. M.V. 1984. Fundamentals of food and nutrition.
2. Swaminathan M. 1996. Food science, Chemistry & experimental food.
3. Shakunthal & M.Shaddaksharaswamy 1999. Food, Facts & Principles.
4. GirdhariLal, G.S. Siddappa & G.L.Tandon 1999. Preservation of fruits and vegetables.

**MSU/2016-17/UG-Colleges /Part IV (B. Sc Plant Biology & Plant Biotech)/
Semester -IV/Ppr.no.32(B)/ Non-Major Elective – II (B)**

Botany for Competitive Examination

Unit I

Basics of the Plant Kingdom – Brief Classification of Plant Kingdom ; Diagnostic features of Algae, Fungi, Bryophyta, Pteridophyta, Gymnosperms, Bacteria, Viruses; Economic importance of these Groups.

Unit II

Basics of Angiosperm Taxonomy: A brief account of Natural System of Classification (Bentham and Hooker's System) and Phylogenetic System of Classification (Engler and Prantl's System). Binomial Nomenclature. A Brief account of the following Families and their Economic importance: Fabaceae, Cucurbitaceae, Poaceae.

Unit III

Medicinal Importance of the following Plants :*Zingiber officinale*, *Vetiveria zizanioides*, *Ocimum sanctum*, *Azadirachta indica*, *Solanum trilobatum*, *Phyllanthus emblica*, *Andrographis paniculata*, *Acalypha indica*.

Unit IV

Basics of Absorption of Water, Transpiration, Photosynthesis, Respiration, Protein Synthesis.

Unit V

Cell Organelles; Tissues and Tissue systems; An introduction to Genetics -Mendelism, Monohybrid cross and Dihybrid Cross; Genetic Engineering - Enzymes used in Gene Cloning experiments. An Introduction to Plant Tissue Culture; Biofertilizers.

References

1. Anjali Shukla. 2006. Hand Book of Biotechnology, Academic (India) Publishers. New Delhi.
2. John Jothi Prakash, E. 2004. Medicinal Botany and Pharmacognosy, JPR Publications, Neyyoor-629 802.
3. John Jothi Prakash, E. 2004. Medicinal and Aromatic Plants JPR Publications, Neyyoor-629 802.
4. Singh V., Pande P.C., and Jain, D.K. 2002. A Text Book of Botany for Degree Students, Rastogi Publications, Meerut.
5. Vashista, P.C. 1985. Taxonomy of Angiosperms. Chand & Co. New Delhi.
6. Verma, V. 2005. A Text Book of Plant Physiology, Emkay Publications, New Delhi.

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

B.Sc. Zoology

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem.	Pt. I/II/ III/ IV/ V	Su b N o.	Subject status	Subject Title	Hrs./ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	I	17	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	18	Language	English	6	3	25	75	100	30	40
	III	19	Core - 5	CELL AND MOLECULAR BIOLOGY	4	4	25	75	100	30	40
		20	Major Practical – III	CELL AND MOLECULAR BIOLOGY	2	-	50	50	100	20	40
		21	Allied -III	CELL BIOLOGY, GENETICS AND BIOTECHNOLOGY	4	4	25	75	100	30	40
		22	Allied Practical-III	CELL BIOLOGY, GENETICS AND BIOTECHNOLOGY	2	-	50	50	100	20	40
	IV	23	Skilled Based subject-I	(A) HOME AQUARIUM (OR) (B)NUTRITION AND DIETETICS	4	4	25	75	100	30	40
	IV	24	Non-Major Elective-I	(A)BEE KEEPING (OR) (B)CLINICAL BIOLOGY	2	2	25	75	100	30	40
Subtotal					30	20					

Sem.	Pt. I/II/III/IV/V	Sub. No.	Subject status	Subject Title	Hrs. / week	Credits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	I	25	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	26	Language	English	6	3	25	75	100	30	40
	III	27	Core - 6	GENETICS	4	4	25	75	100	30	40
		28	Major Practical-IV	GENETICS	2	2	50	50	100	20	40
		29	Allied -IV	DEVELOPMENTAL ZOOLOGY, ECOLOGY, ANIMAL PHYSIOLOGY AND EVOLUTION	4	4	25	75	100	30	40
		30	Allied Practical-IV	DEVELOPMENTAL ZOOLOGY, ECOLOGY, ANIMAL PHYSIOLOGY AND EVOLUTION	2	2	50	50	100	20	40
	IV	31	Skill Based Subject -II	(A) BIOPHYSICS AND BIOINSTRUMENTATION (OR) VERMITECHNOLOGY	4	4	25	75	100	30	40
	IV	32	NON-MAJOR ELECTIVE-II	(A)PUBLIC HEALTH AND HYGIENE (OR) (B) COMMUNITY AND SOCIAL PREVENTIVE MEDICINE	2	2	25	75	100	30	40
	V		Extension Activity	NCC,NSS, YRC, YWF		1					
Subtotal					30	25					

CELL AND MOLECULAR BIOLOGY

UNIT I

Cell types – prokaryotic & Eukaryotic, Microscopy – detailed study of compound microscope, phase contrast & electron microscopes, Cytological techniques – Fixation & Fixatives – types of stains.

UNIT II

Ultrastructure & functions of the following cell organelles: Plasma membrane, mitochondria. Golgi apparatus, endoplasmic reticulum, ribosomes, lysosomes, centriole.

UNIT III

Nuclear components: Ultrastructure & functions of nucleus, nuclear membrane, nucleolus, chromosomes & their types Lampbrush chromosome and Polytene Chromosome, Cancer cells & Carcinogenesis: Definition, types, causes, properties, treatment, Oncogenesis. Cell Signaling.

UNIT IV

Nucleic acids – DNA: Components of DNA, DNA structure & Replication, Hybridization, DNA finger print, DNA as genetic material. RNA- Types, Protein Synthesis – Lac Operon

UNIT V

Cell Division – Mitosis, Meiosis, & synaptonemal complex, functional unit of gene, Genetic code – codon, anticodon & control of gene expression.

REFERENCE BOOKS:

- Ambrose, E.J & Dorothy, M.E: Cell Biology (ELBS CAMLOT PRESS)
- De Robertis & De Robertis: Cell & Molecular Biology. (W.B. Saunders & co, Philadelphia).
- De Robertis, E.D.P, Nowinski, W.N & Saez, F.A : Cell Biology (W.B. Saunders & co, Philadelphia).
- Dupraw, EJ : Cell & Molecular Biology (Academic Press, New York)
- Dyson, R.D :Essentials of Cell Biology (Allyn & Bacon Inc. Boston).
Giese.A.C: Cell Physiology (W.B. Saunders & co, Philadelphia).
- Gupta P.K. – Cell and Molecular Biology, Rastogi Publication, Meerut.
- Norman.S. Cohn : Elements of Cytology (Freeman Book co, Kamia Nager, New Delhi).
- Swanson, C.P & Webster. B : The Cell (Prentice Hall Inc., Engle Wook Cliffs, New Jersey)
- Verma, P.S. and Agarwal, V.K. Cytology eighth edition S. Chand and Co.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Zoology)/
Semester- III/Ppr.no.20/Core Practical -III**

PRACTICALS

- Mitosis in Onion root tip cells./ Garlic root cells.
- Meiosis in Grasshopper testis – Demonstration only.
- Giant chromosome in Chironomous larva.
- Preparation of a) Squamous epithelium
- Preparation of human blood smear
- Preparation of frog blood smear
- **Spotters:**Models & charts: DNA, t-RNA, Ribosomes, Nucleus, Mitochondria, Golgi apparatus,Endoplasmic reticulum, Protein synthesis.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Zoology)/
Semester-III/ Ppr.no.21/Allied – III**

Cell Biology, Genetics and Biotechnology

OBJECTIVE: To elucidate the structure and functions of the cell organelles; to exemplify the concept of genetics, the principles of inheritance and the role of genes in determining characters; to understand the application of the innovative technology to manipulate living organisms or parts of organisms to make products useful to human.

CELL BIOLOGY

UNIT I Ultra structure and functions of (a) Plasma membrane (b) Mitochondria (c) Nucleus. Chromosomes – Structure, types and functions; Giant Chromosomes (Polytene and Lampbrush Chromosomes)

UNIT II DNA: Structure (Watson and Crick Model), Replication.

RNA: Different types – r RNA – mRNA – tRNA; Protein synthesis.

Cancer cells and carcinogenesis – Definition, Types, Causes, Properties, Diagnosis and Treatment.

GENETICS

UNIT III Simple Mendelian traits in man; Multiple alleles – ABO blood groups in man – problems.

Rh-factor in human – Erythroblastosis foetalis. Multiple gene inheritance.

UNIT IV Sex determination in man; Sex linked inheritance in man – Haemophilia, Colour blindness and Hypertrichosis.

Non disjunction and Syndromes in man – Klinefelter's syndrome, Turner's syndrome and Down's syndrome.

Inborn errors of metabolism in man – Phenylketonuria, Alkaptonuria and Albinism

BIOTECHNOLOGY

UNIT V Definition, scope and importance of Biotechnology, Basic concepts of genetic engineering.

Restriction and modification system – Cloning vectors – (Plasmids, pBR 322, Lambda phage)

Introduction of cloned genes into host cells – Transgenesis – Transgenic animals and its application.

CELL BIOLOGY, GENETICS AND BIOTECHNOLOGY

Mounting of Giant Chromosome in Chironomous larva

Analysis of any two planktons (marine/fresh water)

Study of the following through Charts, Slides and Figures:

Mitochondria, Interphase Nucleus, DNA, tRNA, ABO Blood group.

Colour Blindness, Haemophilia, Klinefelter's syndrome, Down's syndrome.

pBR 322, Lambda Phage, Recombinant DNA.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Zoology) Semester-III/Ppr.no.23/
Skill Based- I (A)**

HOME AQUARIUM

UNIT I

Construction of Home Aquarium.

Materials needed – Wooden and metal frames – Frameless tanks – Sealants and Gum. Design and Construction of Public Freshwater and Marine Aquaria. Aerators and Filters – Hand net and other equipment. Water quality requirements – Temperature control and Lighting.

UNIT II

Setting up aquarium – gravel/pebbles – Plants – Ornamental objects and fishes – Selection of species – Introducing fishes to the aquarium. Nutritional requirements of aquarium fishes. Different kinds of feeds. Culture of food organisms. Preparation of dry feeds. Feeding methods

UNIT III

Species of ornamental fishes – Taxonomy and biology of Gold fish, Guppies, Swordtails, Marine fishes – Angels and Butterfly fishes. Fresh water species – live bearers and egg layers, one example each – Common Community fishes – Freshwater and marine, any two examples each.

UNIT IV

Reproductive biology of gold fish and angel fish – Maturation, Secondary sexual characters, Breeding habits, Spawning, Parental care, Fertilization and Development of eggs. Common diseases of freshwater and marine aquarium fishes – Parasites, Fungal, Bacterial- symptoms – Treatment – Prevention and control.

UNIT V

Fresh water plants – their taxonomy and morphology, any three of aquarium plants – provision of nutrient and optimum environmental condition for their growth. Other Ornamental organisms – Anemones, Lobsters, Shrimps, Octopus, Star fish etc.,

REFERENCE BOOKS:

1. Guide to tropical fish keeping, 1967, Braymer, J.H.P. & Liffé.
2. Tropical Marine aquaria, 1974. Cox, J.F. Hamlyn.
3. Tropical Fish: Setting up and maintaining fresh water and Marine aquaria, 1972. Dussa Octopus Book Ltd.
4. Aquarium systems, 1981. Hawkins, A.S. (Ed.) Academic press.
5. Living Aquarium, 1981. Hunnam, P. Ward Lock.
6. Aquarium Fishes and Plants, 1971, Rataj, K. and R. Zikal – Hamlyn.
7. Ornamental Fish for Garden and Home Aquariums, 1956, R and C.P Home Aquariums.
8. Sea Water Aquariums, 1979. Spotte, S. John Wiley.
9. Collins Guide to Aquarium Fishes and Plants, 1969. Schiotez, A. Collins.
10. Complete Aquarium, 1963. Vogt, D. and H. Wermuth Thames.

NUTRITION AND DIETETICS

OBJECTIVE:

To understand the importance of the various food stuff on one side and to study malnutrition, nutrition related diseases and special diets for persons suffering from diseases on the other.

UNIT I

- Macronutrients and their function – Carbohydrates – Fats – Proteins - Water.
- Micronutrients and their function - Vitamins and Minerals.
- Nutritive value of the foodstuff – Cereals – Pulses – Vegetables – Fruits – Milk – Egg – Meat – Fish.

UNIT II

- Parboiling of rice – process of parboiling and uses of parboiled rice.
- Germination of cereals – process of germination and uses of sprouts & its nutritive value.
- Metabolism of foodstuffs – protein, carbohydrate and lipid.
- Food choice and preparation methods.
- Effect of cooking on protein, carbohydrate and fat content.
- Menu planning and meal pattern – vegetarian and non – vegetarian.

UNIT III

- Role of fibres in nutrition.
- Determination of energy content of food – Bomb calorimeter.
- BMR – Determination of BMR – using direct calorimeter and Benedict Methods, Roth basal metabolic apparatus – Factors affecting BMR.

UNIT IV

- Balanced diet – Nutritional requirements of different age groups – Pre schoolers-schoolers – Adolescents – Pregnant, lactating women and Aged people.
- Nutritional diseases – causes and prevention and dietary management of malnutrition, under nutrition and obesity.
- Common nutritional deficiency diseases in India– Kwashiorkor – Marasmas – Anaemia – Goitre.

UNIT V

- Therapeutic diet and its importance, diet planning.
- Symptoms, causes, prevention and dietary management for diabetes mellitus, ulcer, renal diseases, hepatitis, hypertension, atherosclerosis, gastro-intestinal disorders, constipation.

REFERENCE BOOKS:

1. Ann Louise Gittleman. The Fat Flush Plan. Tata Mc Graw Hill Publishing Company Limited,444/1,Sri Embara Naicker Industrial Estate, Alapakkam,Porur,Chennai
2. Hellen Kowtaluk.Food for Today, Tata Mc Graw Hill Publishing Company Limited,444/1,Sri Embara Naicker Industrial Estate, Alapakkam,Porur,Chennai
3. Shubhangini A. Joshi, Nutrition and Dietetics.T Tata Mc Graw Hill Publishing Company Limited,444/1,Sri Embara Naicker Industrial Estate, Alapakkam,Porur,Chennai.
4. Swaminathan, M. Food Science,Chemistry and Experiment.
5. Swaminathan, M. Principles of Nutrition and Dietetics.
6. You and Your food and its utilization, Manuscript.IGNOU.
7. Rajalakshmi,R.Applied Nutrition.
8. Sumathi, R. Mudambi and M.V. Rajagopal. Fundamentals of Food and Nutrition.
9. Stanley Davidson, Passmore,R.Nutrition and Dietetics
10. Pogy,S.,Stanfield. Nutrition and Diet therapy.
11. Fergos Clydesdate,M.Food Nutrition And Health.

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc.Zoology)
Semester-III/Ppr.no.24(A)/Non-Major Elective - I (A)**

BEE KEEPING

UNIT I

Comparative study of Rock bee, Indian bee, Little bee and Dammer bee – Life history of Apis indica. Queen, Drones and Workers – Identification, Salient features and Functions.

UNIT II

Food of the bee – honey and pollen. Relationship of plants and Bees. Arranging an apiary position – space – direction.

UNIT III

Acquiring bees – Care of newly captured colonies. Different kinds of cells. Swarming.

UNIT IV

Primitive hives – Different types. Advantages and Disadvantages of primitive hives. Newton's bee hive and its architecture. Appliances used in Apiaries.

UNIT V

Honey – Collection and Extraction of honey, preservation, storage, Physical properties, chemical composition, Nutritive value, medicinal values, Honey as Daily Food.

REFERENCES:

1. Bee Keeping in India – Sardar Singh- KAR, Delhi.
2. Bee keeping in South India – Cherian M.C. & Ramachandran, Govt. Press, Chennai.
3. Handbook of bee keeping – Sharma P.L. & Singh S., Chandigarh.
4. Apiculture – J. Johnson and Jeyachandra, Marthandam, Tamil Nadu.

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc.Zoology)/
Semester-III/Ppr.no.24(B)/Non-Major Elective - I (B)**

CLINICAL BIOLOGY

UNIT I

Introduction- Normal and Abnormal conditions of body – Symptoms – Samples to be collected for analysis – diagnosis – Instruments used in the analysis - Sterilization .

UNIT-II

Urine Analysis –Collection and preservation of sample and chemical estimation. Protein,Urea,Glycemia sediments and casts,impaired renal function and clearance test.

UNIT-III

Estimation of Gastro intestinal contents –Saliva constituents,Collection and estimation of Gastric juice,Secretion of liver, Duodenal contents and Pancreatic function tests.

UNIT-IV

Clinical Haematology –Ways of obtaining blood, Haemoglobin estimation. Cell counting (DC/ TC),Estimation of Erythrocyte sedimentation test (ESR) ,pathological ,physiological and hereditary disorders, Blood banking ,Blood grouping ,and typing ,Glucose Tolerance Test (GTT) , Impaired Glucose Tolerance Test , Elisa test.

UNIT-V

Fertility test-semen analysis and pregnancy test,RIA test-Agglutination test-Morphological variations –Types-Count and Abnormalities.

REFERENCE BOOKS:-

1. Medical laboratory techniques-R.Sood
2. Text book of preventive medicine-J.E Park,Benansidar Bhalot
3. Introduction of medical laboratory technology-Baker, F.J.Silverton
4. Medical laboratory technology-Lynch.

GENETICS

UNIT I

Introduction to Genetics. Mendel- Reason for Mendel's experiment, Alleles, Backcross, testcross-Mendellian laws of heredity. Monohybrid cross and Dihybrid cross.

Interaction of genes – complementary, supplementary, Duplicate genes, lethal genes in man, epistasis, complete and incomplete dominance, co-dominance.

Multiple alleles – A,B,O blood groups- Rh factors in man Problems related to blood groups - Erythroblastosis foetalis. Multiple genes (polygenic inheritance) skin colour in man.

UNIT II

Linkage – complete, incomplete, crossing over – coupling and repulsion – Mechanism of Meiotic crossing over – chromosomes map; Sex determination in man, Drosophila. Genic Balance Theory. Sex linked Inheritance in man – Haemophilia, colour Blindness, Holandric genes - hypertrichosis- sex limited genes. Non disjunction in man

Extra chromosomal inheritance in paramecium, maternal predetermination in coiling of shell. Animal breeding: – Inbreeding and out breeding, heterosis.

UNIT III

Mutation – types of mutation- gene mutation – genome mutation – mutagens – mode of action of chemical mutagens and ionizing mutagens – detection of mutation by CLB method.

Chromosomal abnormalities – autosomal and sex chromosomes – klinefelters syndrome, Turner's syndrome and Down's syndrome.

UNIT IV

Human genetics – twins. Human chromosome, karyotypes, idiogram, Simple Mendelian traits in man.

Inborn errors of metabolism – phenylketonuria, Alkaptonuria, Albinism, Sickle – Cell anaemia. Improvement of human race – Eugenics, Euthenics, Pedigree Analysis. Genetics Prognosis – genetic counselling – family history – preventive measures.

UNIT V

Bacterial genetics – structure of E-coli, bacterial recombination – transformation conjugation, transduction and sexduction. Genetic application of bacteria, structure and life history of T_4 phage. Genetic application of virus.

REFERENCE BOOKS:

1. Strickberger : Genetics (MacMillan).
2. Farnsworth : Genetics (harper and Row).
3. P.K.Gupta: Genetics (Rastogi Publications)
4. P.S. Verma and Agarwal: Genetics (S.Chand & Co.Ltd.)
5. Altonburg,E: Genetics (Oxford & IBH publishing company)
6. Burns G.W.: The Science of Genetics (Mac Millan)
7. A.C.Pai: Foundations of Genetics (Mc Gaw – Hill)
8. J.A.Serra: Modern Genetics (3 volumes)
9. Sinnot,Dunn and Dobzhansky: Principles of Genetics (McGraw Hill)
10. Gardener: Principles of Genetics.

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Zoology)
Semester-IV/Ppr.no.28/Core Practical -IV

PRACTICALS

1. Breeding Experiment: Chi Square test to be illustrated with beads a) monohybrid and b) dihybrid.
2. Observation of simple Mendelian traits in man – to be recorded.
3. Observation and study of polygenic inheritance of quantitative traits to be interpreted in graphs:-a) height of student b) weight of students / length of shells / length of pods.
4. Blood group to be analyzed in a population with a minimum of 30 students.
5. Spotters: models of genetic significance to be studied E-coli, T_4 phage. Down's syndrome, Klinefelters syndrome, Turner's syndrome, sex linked inheritance (colour blindness, hemophilia, hypertrichosis, and webbed toes).
6. Culture and Observation of *Drosophila* life cycle.

**DEVELOPMENTAL ZOOLOGY, ECOLOGY, ANIMAL PHYSIOLOGY
AND EVOLUTION**

OBJECTIVES:

To understand the sequential changes from cellular grade of organization to organ grade of organization in the development of multicellular organisms. To study the interaction and the interdependence among environmental factors and living organisms; To understand the functional significance of various organs and organ systems of animals. To discern the evolutionary significance of the animals, origin of species, effects of mutation.

UNIT I

Early development in Man: Structure of sperm and ovum; Fertilization – Cleavage, Morula, Blastocyst, Implantation and gastrulation – Fate map. Placenta in mammals – types and functions. Test tube babies – Twins – Amniocentesis. Nuclear Transplantation in Acetabularia.

UNIT II

Abiotic factors: Biological effects of Temperature and Light; Biotic factors: Symbiosis, Commensalism, Mutualism, Parasitism, Prey-predator Relationship; Adaptations: Desert adaptations. Community: Ecosystem – Structure and dynamics of a pond.

UNIT III

Nutrition: Food constituents – Carbohydrates, Proteins and Fats.

Digestion: Role of enzymes in carbohydrate, protein and fat digestion.

Absorption: Absorption of digested food.

Metabolism: Carbohydrate metabolism: Glycogenesis, Glycogenolysis, Glycolysis.

Respiration: Transport and exchange of oxygen and carbon dioxide. Haemoglobin.

UNIT IV

Excretion: Structure of Nephron – Urine formation – Dialysis Nervous Co-ordination: Structure and types of neurons – Nerve impulse, conduction of nerve impulse through neuron and synapse.

Reproduction: Structure of human testis and ovary, Graafian follicle, Menstrual cycle and its hormonal control.

UNIT V

Theories of Evolution: Darwinism, Mutation theory of De Vries.

Adaptive radiation in birds.

Mimicry and Colouration.

DEVELOPMENTAL ZOOLOGY, ECOLOGY, ANIMAL PHYSIOLOGY AND EVOLUTION.

1. Mounting and observation of live sperms of a vertebrate.
2. Estimation of dissolved oxygen in two water sample and discuss the result
3. Qualitative test for glucose, protein and lipid.
4. Effect of temperature on the opercular movement of fish; Calculation of Q_{10} .
5. Museum specimens, slides, models and charts:

Developmental Zoology: Human sperm, Human ovum, Cleavage, Diffuse Placenta, Zonary Placenta, Discoidal placenta, Cotyledonary Placenta (any two)

Ecology: Echinoids and Shark, Hermit crab and Sea anemone, Sacculina, Secchi disc.

Animal Physiology: Intestinal villi, Nephron, Heart of mammal.

Evolution: Ancon sheep.

Allied Practical Examination I for course subjects 1.1 and 2.1 at the end of the Second Semester.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Zoology) Semester-IV/Ppr.no.31(A)/
Skill Based –II (A)**

BIOPHYSICS AND BIOINSTRUMENTATION

UNIT I

Biophysics – Scope and Method – Atoms – Molecules – Molecular Interactions – Chemical bonds – Primary chemical bonds – Secondary chemical bonds. Principles of Thermodynamics – Laws of Thermodynamics – Enthalpy – Entropy – Living systems and energy changes.

UNIT II

Bioenergetics – Energy and Work – Energy Transformation – ATP – Bioenergetics – Structure of ATP – Formation of ATP – NADP – Structure – NADP / NADPH Redox couple – Mitochondrial bioenergetics – Chloroplast bioenergetics. Membrane Conductivity – Diffusion – Active transport – Osmosis – Electric conductivity

UNIT III : Photobiology – Nature of light and its properties – Absorption and Emission Spectra – action spectrum, Refractive index – Huygen's Principle – Polarized light – Solar radiation – UV – Infrared – De- excitation- Bioluminescence – Fluorescence – Phosphorescence.

UNIT IV: Instrumentation – Microscopy – Principle and application of Electron Microscope. Basic Instruments – Principle and applications of pH meter and Colorimeter. Centrifugation – Principle and Types – Chromatography – Principle – Types – Paper, Ion exchange, HPLC and applications

UNIT V

Labeling Techniques: Isotopes, Radioactivity, Radioactive decay, half – life, autoradiography, biological use of radioactivity, radioactivity Counter – Principle – Types – Geiger Muller – Scintillation Counter. Electrophoresis – Principle – Types – Agarose Gel electrophoresis, Polyacrylamide gel – Sodium Dodecyl Sulphate Polyacrylamide gel – Applications. PCR Technology: Working mechanism of PCR. Gel Doc. – Principle – Working mechanism – Lyophiliser – Principle – Working mechanism – applications.

REFERENCE BOOKS:

1. Saleel Bose: Elements of Biophysics.
2. Casey: Biophysics – Concepts & Mechanism.
3. Vasantha patabhi N. Gautham: (Narosa publishing House) – Biophysics.
4. Jeyaraman, K. : Laboratoy Manual in Biochemistry. New Age International publishers.
5. Kalaichelvan, P.T: A Laboratory Manual, MJP Publishers, 47, Nallathambi Street, Triplicane, Chennai 600 005.
6. Gurumani, N: Research Methodology for Biological Sciences. MJP 47, Nallathambi Street, Triplicane, Chennai 600 005.
7. Palanivelu, P. Analytical Biochemistry and Separation Techniques. A Laboratory Manual for B.SC and M.SC Students. Department of Molecular Biology, M.K. University, Madurai-625 021.
8. L. Veerakumari, Bioinstrumentation MJP Publishers, 47, Nallathambi Street, Triplicane, Chennai 600 00

VERMITECHNOLOGY

UNIT I

Earthworm taxonomy – Morphological and anatomical – Classification of earthworms – Food habits – Digestive system – Excretion – Reproduction and Life cycle – Earthworm as farmer's friend.

UNIT II

Types of earthworm – Exotic and native species – South Indian and North Indian species used in Vermicomposting – Collection and Preservation of earthworms for vermicomposting – Culture techniques of earthworms.

UNIT III

Vermicompost production – Requirements – Different methods of Vermicomposting – Heap method – Pot method and Tray method – changes during Vermicomposting.

UNIT IV

Role of Earthworms in soil fertility – Use of Vermicompost for crop production – Use of earthworms in land improvement and land reclamation – Economics of Vermicompost and vermivash production. Earthworms as animal feed – Medicinal value of earthworm meal – Role of Earthworms in Solid Waste, Sewage and faecal waste management and Vermifilters. Earthworms as bioreactors.

UNIT V

Interaction of earthworms with other organisms – Influence of chemical inputs on earthworm activities – Large scale manufacture of Vermicompost, packaging of vermicompost and its marketing – Financial supporting – Government and NGOs for vermiculture work.

REFERENCE BOOKS:

1. Invertebrate Zoology – Ekambaranatha Ayyar.
2. Earthworm in Agriculture – S.C.Talashikar and Dosani, Agrobios Publications, Near Nasarani Cinema, Jodhpur,342 002.
3. Vermicompost for sustainable Agriculture – P.K. Gupta Agrobios 2nd Edition.
4. Organic Farming for sustainable Agriculture – A.K.Dahama,Agrobios.
5. A Hand book of Organic farming – A.K.Sharma.Agrobios publication.
6. Earthworm ecology – Clive A.Edwards St.Lucie press – CRC Press Washington DC.
7. Biology of Earthworm - Edward and Lofti – Chapman and Hall Publication.
8. Vermicology – Sultan A.Ismail – Orient Longman Press.
9. Vermiculture Biotechnology – U.S.Bhawalkar BERI,PUNE.

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Zoology) Semester-IV/Ppr.no.32(A)/
Non-Major Elective – II (A)**

PUBLIC HEALTH AND HYGIENE

UNIT I

Physical, Mental, Social – Positive health – Quality of life Index.

Nutrition and Health – Food hygiene – Food toxicants.

Population explosion in India – Birth control measures.

UNIT II

Environment and health – Water – Sources of water – Uses of water. Water borne diseases – Cholera – Ascariasis. Standards of Housing – Ventilation.

UNIT III

Excreta disposal – Importance – Methods of excreta disposal. Sanitary health measures during fairs and festivals. First aid with reference to accident.

UNIT IV

Communicable disease – Viral diseases – AIDS, Rabies. Bacterial diseases – Tuberculosis, Typhoid. Protozoan diseases – Amoebiasis.

Helminth diseases – Filariasis,

UNIT V

Health situation in India – Health problems – Primary health care in India – PHC – National Programmes – National AIDS control – National Malaria Eradication Programme – National Tuberculosis.

REFERENCE BOOKS:

1. Anderson R. Clifford. Your Guide to Health.
2. Basu, S.C. Preventive and Social Medicine.
3. Goel, S.O.L. Public Health Administration.
4. Harold Shoryock and Hubert O. Swartout. You and Your Health illustrated Dealing with Diseases.
5. Park, K. Park's Text Book of Preventive and Social Medicine. Banarsidas Bhanot Publishers, 1167 Prem Nager, Jabalpur – 482 001.
6. Ramarao, V. First Aid in accidents. Sri Krishna brothers, Thambu Chetty Street, Chennai.
7. Sanitarians Hand Book. Theory and Administrative Practice. Pearles Publications, New Orleans, USA.

COMMUNITY AND SOCIAL PREVENTIVE MEDICINE

UNIT-I

Community and Health Meaning and concept-Biomedical, Ecological, Psychological, Social and holistic. Determinants of health & Indicators of health. Concept of community health, Role of primary health centers.

UNIT-II

Drug Addiction: In India today – incidence among college students – common drugs in vogue – their side effects, control and management of drug addiction. **Alcoholism:** Its effect on various organs like heart, lungs, liver, pancreas, brain and intestine – chronic alcoholism – alcoholic withdrawal syndrome – its control and treatment.

UNIT-III

Sexually transmitted diseases: Gonorrhoea – Syphilis – AIDS – Causative agent, causes – symptoms – diagnosis – treatment and control measures.

UNIT-IV

Child abuse: Definition – causes – effects – Legal measures for eradication.

UNIT-V

Problems of old age: Concept of ageing. Housing and health care of the aged. Problems – Cardiovascular – alimentary – Locomotion and joints – welfare service provided to the aged by the Government.

PRACTICALS:

- Simple staining of bacteria.
- Gram staining of bacteria.
- Visit to primary health centres.
- Health survey report of a rural community.
- Museum specimens, slides, models and charts – *Treponema pallidum*, *Neisseria gonorrhoeae*, AIDS virus, Liver cirrhosis and illustrations related to theory syllabus.

REFERENCE BOOKS:

1. Social Problems in India - Ram Akuja.
2. Social Preventive Medicine – Park & Park.
3. Ageing and Aged - Paul Chowthry.
4. Indian Social Problem – G.R. Madan.

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

Part – II English

General English - Paper -III

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Scheme for internal Assessment

3 internal tests, each of 1 hr duration shall be conducted every semester.

Maximum marks for **written test: 20 marks**

To the average of the best two written examinations must be added the marks scored in the **oral assignment for 5 marks.**

The Compulsory oral assignment should comprise the testing of reading skill, listening skill and spoken English.

(Reading skill- 1 mark; listening skill- 1 mark; spoken English – 3 marks)

The break up for internal assessment shall be:

Written test- 20 marks; Assignment (Oral) -5 marks

Total 25 marks

MSU/2016-17/UG-Colleges/Part-II (English)/Semester-III

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

Part – II English

General English – Paper- III

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

Unit 1 – Prose (2 hours)

I Have a Dream – Martin Luther King

The Turning Point of My Career – A.J. Cronin

The Lost Child – Mulk Raj Anand

Shooting an Elephant – George Orwell

Unit 2 – Poetry (1 hour)

The Unknown Citizen – W.H. Auden

Punishment in Kindergarten – Kamala Das

Ulysses – Tennyson

O Captain! My Captain! – Walt Whitman

Unit 3 Fiction (1 hour)

Lorna Doone –R.D. Blackmore (Retold by E.F.Dodd)

Unit 4 Grammar (1 hour)

Concord

Conditional Sentences

Conjunctions and Interjections

Phrasal Verbs

Phrases and Clauses

Unit 5 Oral Communication Skills (1 hour)

Greeting

Introducing

Inviting Someone

Making Requests

Accepting Requests

Offering Help

Asking for Help

Asking for Advice

Expressing Gratitude

Congratulating

Telephone Skills

MSU/2016-17/UG-Colleges/Part-II (English)/Semester-III

Text Book : Expressions -III (Anu Chithra Publications)

(All prescribed Prose lessons, Poetry, Fiction, Grammar and Oral Communication Skills, i.e. Units I, II, III, IV, and V are found in this book)

MSU/2016-17/UG-Colleges/Part-II (English)/Semester-IV

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

Part – II English

General English – Paper-IV

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

Unit 1 – Prose (2 hours)

On the Pleasures of No Longer Being Very Young – G.K. Chesterton
On Umbrella Morals – A.G. Gardiner
My Visions for India – A.P.J . Abdul Kalam
My Financial career – Stephen Leacock

Unit 2 – Poetry (1 hour)

Where the Mind is without Fear – Rabindranath Tagore
Ode to Autumn – John Keats
If You Call Me – Sarojini Naidu
Insensibility – Wilfred Owen

Unit 3 - Select Scenes from Shakespeare (1 hour)

The Trial Scene from *The Merchant of Venice* (Act IV Sc 1 Lines 1-163)
Bed Chamber Scene – *Othello* Act V. Sc. II
Balcony Scene – *Romeo and Juliet* – Act II Sc. ii

Unit 4 Grammar (1 hour)

Simple, Compound and Complex
Transformation of Sentences
 Affirmative to Negative
 Negative to affirmative
 Assertive to Interrogative
 Interrogative to Assertive
 Exclamatory to Assertive
 Assertive to exclamatory
Synthesis of Sentences
Spotting the Errors

Unit 5 Communication Skills (2 hours)

Email Writing
Agenda Writing
Minutes Writing
Resume Writing

MSU/2016-17/UG-Colleges/Part-II (English)/Semester-IV

Text Book : Expressions – IV (Trinity Press - an imprint of Laxmi Publications)

(All prescribed Prose lessons, Poetry, Scenes from Shakespeare, Grammar and items under Communication skills, i.e. Units I, II, III, IV, and V are found in this book)

MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI
PG - COURSES – AFFILIATED COLLEGES
Course Structure for M.A. (Economics)
(Choice Based Credit System)
(With effect from the academic year 2017-2018 onwards)

Sem.	Sub. No.	Subject Status	Subject Title	Contact Hrs./ Week	Credits
(1)	(2)	(3)	(4)	(5)	(6)
I	1	Core - 1	Advanced Micro Economics Theory - I	5	4
	2	Core - 2	Macro Economic Theory and Analysis I	5	4
	3	Core - 3	Statistical Methods for Economics I	6	4
	4	Core - 4	Monetary Economics	5	4
	5	Elective - 1	International Economics	5	3
	6	Elective - 2	History of Economic Thought	4	3
II	7	Core - 5	Advanced Micro Economics Theory - II	6	4
	8	Core - 6	Macro Economic Theory and Analysis II	5	4
	9	Core - 7	Statistical Methods for Economics II	6	4
	10	Core - 8	Environmental Economics	5	4
	11	Elective - 3	Indian Economy	4	3
	12	Elective - 4	Computer Applications in Economics	4	3
III	13	Core - 9	Mathematical Methods I	6	4
	14	Core - 10	Development Economics	5	4
	15	Core - 11	Public Finance/ Financial Economics	6	4
	16	Core - 12	Research Methodology	5	4
	17	Elective - 5	Micro Finance	4	3
	18	Elective - 6	Industrial Economics/Econometrics	4	3
IV	19	Core - 13	Mathematical Methods II	5	4
	20	Core - 14	Planning and Growth	5	4
	21	Core - 15	Public Economics	5	4
	22	Core - 16	Health Economics	5	4
	23	Core - 17	Project	10	8

For the Project, flexible credits are b/w 5 - 8 & Hours per week are b/w 10 - 16.

Total number of credits	≥ 90	:	90
Total number of Core Courses	:	:	17 (16 T + 1 Project.)
Total number of Elective Courses	:	:	6
Total hours	:	:	120

ADVANCED MICRO ECONOMICS THEORY – 1

UNIT: I Theory of Consumer Demand:

Basic Economic problem – Economic theories- validity of Economic Theories for policy making – pragmatic approach to Demand Analysis – Constant Elasticity of demand model – Distributed lag models – Linear expenditure system – Dual properties and propositions- Roys Identity – Shepherds Lemma – Slutsky theorem.

UNIT: II Theory of Production:

Production function – continuous aggregate production function – Cobb Douglas production function – constant Elasticity of Substitution (CES) – Translog production function – Technical progress – Embodied and Disembodied neutral labour saving and capital saving technical progress – Derivation Cost function from production function.

UNIT: III Market Structure and Pricing:

Perfect Competition – Short run and long run of the firm and industry – price and output determination – Monopoly – price determination Monopoly control – Price discrimination – Monopolistic competition – general and Chamberlin approaches to equilibrium – Equilibrium of product differentiation and selling costs – excess capacity – criticisms of monopolistic competition – monopsony – bilateral monopoly.

UNIT: IV Duopoly and Oligopoly:

Oligopoly and duopoly models – collusive and non-collusive models- Cournot, Bertrand, Chamberlin, Sweezy, Stackelberg models, Cartels – price leadership – Non-price competition in oligopoly.

UNIT: V Theories of Firm:

Bain's limit pricing theory – Silos-Labini model of limit pricing – Franco Modiglianis contributions to limit price – profit maximization theory – theory of full cost or average cost pricing – the Andrew's version; The marginalist controversy.

Books for Reference:

1. Koutsoyiannis, A. Modern Micro Economics, ELBS Macmillan,1994.
2. Baumol, W.J. Economic Theory and Operations Analysis: Prentice Hall of India, New Delhi.
3. Stonier,A.W. and Haque D.C. – A Text Book of Economic Theory
4. Halvarian, Micro Economics (Advanced) Affiliated East West Press.
5. Jhingan,M.L. Advanced Economic Theory: Brinda Publications, New Delhi.
6. Ahuja, H.L. Advanced Economic Theory: S.Chand & Company Ltd. New Delhi.
7. Herderson, J.M. and Quandt.Micro Economics: Mc Graw Hill Publications.
8. David F. Heith and Soren Wibe: Cost and Production Function: Macmillan Publications.

MACROECONOMIC THEORY AND ANALYSIS - I

Unit – I : Introduction

Some Basic Macroeconomic Concepts : Macroeconomic Variables – Relationship between Variables – Time Series and Cross-Section Analysis – Ex-ante and Ex-post Variables – Need of an Aggregate Approach – Limitations.

Unit – II : National Income and Circular Flow of Income

Concepts of National Income – Keynes’s Concept of National Income – National Income Accounting – Social Accounting : Input-Output Accounting, Flow of Funds Accounting - Problems in the Measurement of National Income – National Income and Social Welfare – Circular Flow of Income.

Unit – III : Consumption Function

Keyne’s Psychological Law and its Implications – Determinants of Consumption – Absolute Income Hypothesis – Relative Income Hypothesis - Life Cycle Hypothesis – Permanent Income Hypothesis – Pigou’s Real Balance Effect - Long Term Consumption Function.

Unit – IV : Investment Function

Concepts and Types of Investment – Determinants of Investment – Marginal Efficiency of Capital – Marginal Efficiency of Investment – Acceleration Theory and Investment –

Unit – V : Macroeconomic Issues

Inflation – Meaning and Types – Keynesian Theory of Inflation – Modern Theory of Inflation – Philips Curve.

Business Cycle – Meaning and its Nature – Theories of Business Cycle : Samuelson’s Model, Kaldor’s Model, Hicks Model of Business Cycle.

References :

1. Dernberg, T.F., Macroeconomics: Concepts, Theories and Policy, Mc Grow Hill 1985.
2. Friedman and Heller., Monetary VS Fiscal Policy, New York University Press, 1969.
3. Branson. W., Macroeconomics Theory and policy, Harper & Row, 1989.
4. Roberts, P. G., The supply side Revolution, Harvard University Press, 1983.

5. Baumol. W. J and Blinder, Alan. S., Economics, Principles and Policy, Harcourt Bruce, London 1988.
6. Shapiro. E., Macroeconomic Analysis, Harcourt Bruce Inc, 1994.
7. Eisner. R and Robert H. Strotz., Determinants of Business Investment, Impact of Monetary Policy, Prentice Hall -0 1993.
8. Branson.W., Macroeconomic Theory and Policy, Harper & Row 1984.
9. Gordon, R. J. Macroeconomics, Little Brown 1981.
- 10.Ghosh B.N. Modern Macroeconomics: Theory and Policy, Ane Books, New Delhi, 2012.
- 11.Gupta G.S., Macroeconomics Theory and Application, Mc Grow- Hill, New Delhi, 2008.
- 12.Jhingan. M.L. Macroeconomics Theory- Rinda Publication New Delhi 2012.
- 13.Hamberg. D., Business Cycle, Mac Milan, New York, 1951.

STATISTICAL METHODS FOR ECONOMICS - I

Unit – I: Correlation

Simple Correlation – Meaning – Types – Assumptions and Limitations - Karl Pearson's Correlation co-efficient and Spearman's Rank Correlation co-efficient and their properties.

Unit – II: Regression

Simple Regression – Types of regression – Methods of Estimation of Linear Equations using Ordinary Least Square Method – Standard Error of Regression co-efficient - Partial and Multiple Regression.

Unit – III: Time Series Analysis

Time Series Analysis – Concept and Components – Utility of Time Series - Determination of Regular Trend and Seasonal Indices.

Unit – IV: Index Numbers

Index Numbers – Concept, Price Relative, Quantitative Relative, Value Relative – Methods of Constructing Index Numbers – Unweighted Index Numbers – Weighted Index Numbers – Problems in the Construction of Index Numbers - Tests of Adequacy of Index Numbers - Consumer Price Index Numbers.

Unit – V: Vital Statistics

Definition – Uses of Vital Statistics – Methods of Obtaining Vital Statistics – Measurement of Fertility – Reproduction Rates – Measurement of Mortality – Life Tables and its Uses.

References:

1. *Sancheti D.C.* and Kapoor V.K. – Statistics, Theory, Methods and Applications.
2. *SC. Gupta* and V.K. Kapoor, Fundamentals of Mathematical Statistics.
3. *S.P. Gupta* – Statistical Methods.

MONETARY ECONOMICS

Unit I:

Concepts of Money: Traditional and Modern view – Concept of liquidity – Radcliffe Committee – Gurley and Shaw hypothesis

Unit II:

Demand for money: Meaning – Classical Approach – Keynesian Approach – Post-Keynesian Approach – Real Balance Effect – Friedman’s Theory of Demand for Money – Tobin’s Portfolio Selection Model.

Unit II:

Money Supply concepts: - RBI – Money supply and Price level – Components of Money supply – Determinants of money supply – Hi-powered money and money multiplier – Control of money supply – Theories of Inflation – Control of inflation.

Unit IV: -

Financial System: - Structure of Financial system – Financial market – Market and its composition – Capital Market – Government and Industrial Securities Market – Regulation of Financial Market – SEBI.

Unit V: -

Monetary Policy: - Meaning – Objectives – Instruments – Role of Monetary Policy in developing countries – Expansionary and Restrictive Monetary Policy – Limitations of monetary policy with special reference to India.

Books for Reference:

1. Mishra SS, Money, Inflation and Economic Growth, Oxford and IBH Publishing company, New Delhi, 1981.
2. Gupta L.C., India’s Financial Markets and Institutions, Society for Capital Research and Development, New Delhi, 1999.
3. Jhingan M.L., Monetary Economics, Vrindha Publications, New Delhi.
4. Inflation Theory and Policy, Haggan, A.J., 1977, London, The Macmillan Press Ltd.
5. Macro Economics, Income and Monetary Theory Aschheim Joseph and Ching Yao Hseih, 1969, Charles E Merrill Publishing Co., Columbus Ohio.

INTERNATIONAL ECONOMICS

Unit I: Theories of International Trade: -

Importance of International Economics – Basic Concepts: Production Possibility Curve – Opportunity Cost – Offer Curve .The Modern theory of Factor Endowments - The Heckscher–Ohlin Theory - Samuelson’s factor – Price Equalization Theory. Factor intensity reversals – Single - Multiple - Stolper–Samuelson Theorem – Rybczynski Theorem - Leontief Paradox

Unit II: Economic growth and International trade: -

Gains from Trade - Effects of Growth on Trade, on terms of trade and on production - Trade welfare and terms of trade of a small country and large country - Immiserising growth.

Unit III: Balance of Payments and Foreign Exchange: -

Structure and Components – Adjustment Mechanism of BOP – Types and Effects of Tariffs – Types of Non-Tariff Barriers – Foreign Exchange Rate and its policy – Control of Foreign Exchange.

Unit IV: Economic Integration and Co-operation: -

Regional Trade Blocks – Bi-lateral and Multi-lateral International Negotiations, Preferential Trade Areas (PTAs) and Free-Trade Areas (FTAs) – Objectives, Functions – Structure and Working of IMF, World Bank and Asian Development Bank.

Unit V: World Trade Organization: -

WTO – Origin – Objectives – Structure – Functions – Working of WTO – WTO Agreements – Multilateral Agreements on Trade in Goods – Agreement on Agriculture – Agreement on Textiles and clothing – Anti-Dumping – GATS, TRIPS, TRIMS, south-South Co-operation and SAARC.

Books for reference:

1. International Economics, Francis Cherunilam, TATA McGraw-Hill Publishing Company Ltd.
2. International Economics, Vaish M.C., Sudama Singh Oxford and IBH Publishing Co.Pvt Ltd.,.
3. International Economics, Jhingan M. L., Vrindha Publications Pvt. .td/. Delhi-91.
4. International Economics, Sankaran S, Morgham Publication, Chennai- 17.
5. International Economics, Mithani D M., Himalaya Publishing Housing.
6. International Economics, Desai S S M and Nirmal Bhalerao.

HISTORY OF ECONOMIC THOUGHT

Unit – I : Pre-Classical Period and Classical School

Importance of history of economic thought – Mercantilism – main characteristics - Physiocrats: Quenay's tableau economique concept of surplus growth.

Classical School: Adam Smith: The invisible hand doctrine – wealth of nation – laissez faire – labour profit and wages – critiques of Adam Smith. David Ricardo: Theory of value – theory of rent – comparative advantage theory of trade. Malthus: theory of population – critique of say's law.

Unit – II : The Neo Classical School

The Marginalist revolution: Value (Marginal utility theory) and distribution (Marginal productive theory of wages) – General equilibrium: Walras and Pareto – Marshall's Contributions: role of time in price determination – ideas on consumers' surplus – elasticities – prime and supplementary costs. Pigou: Welfare Economics – Schumpeter role of entrepreneur and innovations – Criticism of neo classical school.

Unit – III : Socialism and Marxian Thought

Evolution of socialist thought – Utopian. Socialism – Saint Simon Oweri Blance – Fourier – Proudhon – Scientific Socialist.

Karl Marx – Efforts at scientific socialism – Organic composition of capital – Breakdown of capitalism – Reserve army of labour – critiques of Marx – Modern revival of Marxian economics.

Unit – IV : The Keynesian Revolution and Monetarism

Keynes's criticism of classical theory – Keynesian theory of employment – Keynes and economic policy – Monetarism: Milton Friedman's new quantity theory – friedman's concept of natural rate of unemployment.

Unit – V : Modern Developments

Amartya Sen's Capability theory of welfare – Twentieth century economic thought – main features - the rise of Keynesianism – critical valuation of the development of economic thought.

References :

1. Eric Roll, “A History of Economic Thought”, Faber & Faber Publishing House, London, UK – 2002 New and Revised Edition.
2. Gride Charles and Charles Rist, “A History of Economic Doctrines’ D.C. Health and Company, Massachusetts, USA.
3. Hajela TN, “History of Economic Thought”, ANE Books Pvt. Ltd., New Delhi.
4. Lewis H. Haney, “History of Economic Thought: A Critical Account of the Origin and Development of the Economic Theory”, Forgotten Books Publisher, United States – 2017 Revised Edition.
5. Lionel Robbins, “A History of Economic Thought – The LSE Lectures”, Princeton University Press, New Jersey, USA - 2000 Revised Edition.
6. Lokanathan, “History of Economic Thought”, S. Chand Publishing House, New Delhi.
7. Robert B. Ekelund Jr. and Robert F. Hebert, “A Hisotry of Econmic Theory and Method”, Waveland Press, USA - 6th Edition 2013.
8. Wiebke Kuklys, “Amartya Sen’s Capablility Approach: Theoretical Insights and Empirical Applications”, Springer Publishing, New York, USA.

Advanced Micro Economic Theory – II

UNIT –I Alternative Theories of Firm:

Recent Developments in the theory of pricing – Baumol’s theory of sales revenue maximization – Cyert and March model – Maximum rate of growth hypothesis by Marris – Williamson’s model of Managerial discretion – Behavioural theory of firm – Game theory.

UNIT –II Distribution:

Neo-classical approach – Marginal productivity theory – Euler’s theorem- the adding up problem – Modern theories of rent, wage, interest and profit – liquidity preference theory of interest – Shackle’s theory of profit – Macro theories of distribution – Ricardian, Marxian, Kalecki and Kaldor.

UNIT –III Welfare Economics:

Pigovian Welfare Economics and Externalities – the compensation criteria – Kaldor, Hicks criteria – Scitovsky criterion – Problems of existence, stability and uniqueness of general equilibrium – Maximisation of Social Welfare – marginal conditions of paretian optimum – pareto optimality and competitive equilibrium.

UNIT –IV General Equilibrium Analysis:

Walrasian General Equilibrium Analysis – $2 \times 2 \times 2$ model – pareto optimality – tatonnement and non- tatonnement process – Social Welfare function – Arrow’s impossibility theorem – second best theory.

UNIT –V Theories of Risk and Uncertainty:

Choice under certainty - formalization of uncertainty – choice under uncertainty – contingent consumption – properties of utility function and probabilities – criticisms of the expected utility theory – Risk aversion – The demand for insurance – diversification of risk – Risk spreading – Role of stock market effect of taxation on investment in risky assets.

Books for Reference:

1. Jhingan, M.L. Advanced Economic Theory: Brinda Publications, New Delhi.
2. Koutsoyiannis, A. Modern Micro Economics: Macmillan Press, London.
3. Baumol, W.J. Economic Theory and Operations Analysis: Prentice Hall of India, New Delhi
4. Cullis and Jones; 1988, Public Economics and Public Choice: Oxford University Press.
5. Gravelle and Rees; 1988, Micro Economics: Longman House.
6. Halvarian, Micro Economics (Advanced) Affiliated East West Press
7. Thirlwall, A.P.; 1994, Growth Economics, ELBS.

MACROECONOMIC THEORY AND ANALYSIS - II

Unit – I : Neo-Classical and Keynesian System

Classical, Neo-Classical and Keynesian View on Interest – The IS-LM Model – IS-LM Model with Government Sector – IS-LM Model with Labour Market and Flexible Prices.

Unit – II : Income Theory of Prices

Quantity of Money and Price Level – Development of Income Theory - Keynes's Contribution Saving and Investment Approach – Major Propositions of Income Theory – Limitations – Its Superiority over Quantity Theory – Supplementary to Quantity Theory.

Unit – III : Post Keynesian Developments in Macro Economics

The Rational Expectation Hypothesis – Supply-Side Economics.

Unit – IV : Theory of Income and Employment

Classical and Keynesian Theory of Income and Employment – Say's Law of Market - Classical Models – Critical Appraisal – Keynesian Theory of Income Employment and Output – Keynesian Economics and Less Development Countries.

Unit – V : Macroeconomic Policies

Need to Control Inflation and Business Cycle – Goal of Macroeconomic Policies - Monetary and Fiscal Policy – Fixed Target Approach – Optimizing Approach - Cost Benefit Approach – Effectiveness of Monetary Policy and Fiscal Policy in IS-LM Framework – Income Policy.

References :

1. Ackley. G., Macroeconomic Theory and Policy, Mac Millan New York, 1976.
2. Rana. K.C. and Verma K.N., Macroeconomics Analysis, Vishal, 1999.
3. Beckerman.W., An Introduction to National Income and Social Accounting, University of Lardy, 1967.
4. Dernburg. T., Macroeconomics concept, Theories and policies, Mc Grow Hill, New York 1985.
5. Roa. V.K.R.V., Investment, Income and multiplier in underdeveloped Economy, Indian Economic Review – 1952.
6. Shapiro. E., Macroeconomic Analysis, Harcourt Bruce Inc, 1994.
7. Eisner. R and Robert H. Strotz., Determinants of Business Investment, Impact of Monetary Policy, Prentice Hall -0 1993.
8. Branson.W., Macroeconomic Theory and Policy, Harper & Row 1984.

9. Gordon, R. J. Macro economics, Little Brown 1981.
10. Ghosh B.N. Modern Macroeconomics: Theory and Policy, Ane Books, New Delhi, 2012.
11. Gupta G.S., Macroeconomics Theory and Application, Mc Grow- Hill, New Delhi, 2008.
12. Jhingan. M.L. Macroeconomics Theory- Rinda Publication New Delhi 2012.
13. Hamberg. D., Business Cycle, Mac Milan, New York, 1951.

STATISTICAL METHODS FOR ECONOMICS - II

Unit – I: Probability Theory and Distributions

Probability – Definition (Classical and Empirical) – Theorems of Probability – Conditional Probability – Bayes’ Theorem – Random Variables (Discrete and Continuous) – Special Probability Distributions – Binomial, Poisson and Normal (Properties, Uses, Illustrations).

Unit – II: Sampling Theory

Sampling – Basic Concepts and Laws of Sampling – (Law of Statistical Regularity and Law of Inertia of Large Numbers) – Sampling Errors – Sampling Distributions – Sampling Distribution of means Sampling Distribution of Proportions – Standard Error and its uses.

Unit – III: Estimator

Estimator and Estimate – Point Estimate and Interval Estimate – Properties of a good Estimator – Method and Estimation – Least Square Method – Problems related to Estimator.

Unit – IV: Testing of Hypothesis

Null and Alternative Hypothesis – Simple and Composite Hypothesis – Type I and Type II Errors – Critical Region – Level of Significance – One Sided and Two Sided Tests – **Unit – V:**

Sampling Distributions

Sample Distributions – “Z”, “t”, “F”, “X²” Distributions and Applications – Testing of Means and Analysis of Variance (ANOVA) – Goodness of Fit.

References:

1. *Sancheti D.C.* and Kapoor V.K. – Statistics, Theory, Methods and Applications.
2. *SC. Gupta* and V.K. Kapoor, Fundamentals of Mathematical Statistics.
3. S.P. Gupta – Statistical Methods.
4. M. Des Raj, Sampling Theory.
5. G.W. Cochran, Sampling Techniques.

ENVIRONMENTAL ECONOMICS

Unit I: Introduction to Environmental Economics

Introduction to resources and Environment in Economic Theory-Classification of resources - Emergence of Resource and Environment Economic Theory - Material Balance Principle

Unit II: Efficiency and Market Failure

Environmental resources - Scarcity and choice - Economic efficiency; Efficient allocation; Efficiency in consumption production and product run efficiency; Social Welfare Function and Optimality; Inter – temporal efficiency; Optimal allocation and a market Economy - Market Failure and Public Policy - Externality and Public Goods - Externality and Economic Efficiency

Unit III: Harvesting renewable and non-renewable resources: -

Simple optimum resource depletion model - Resource extraction in perfect competition and monopolistic market - Dynamics of resource harvesting - Socially optimal resource harvesting -Economics of Forestry – Conservation of resources.

Unit IV: Pollution and depletion of quality and quantity of environmental resources: -

Classification of forms of pollution - Nature of emissions-Damage relationship-Zone of influence –Degree of atmosphere mining-Mobility of emission sources-Efficient level of pollution -Pollution abatement - Issues in economics of pollution – Technological progress, Minimum Standard of Conservation

Unit V: Environment and Economic Policy: -

Coase theorem - Economically efficient and cost effective pollution abatement programs - Forms of direct regulation (tax, subsidies, and permits) Economic growth and natural environment Population Growth, Economic; International and Global Environmental Population Problems – Sustainable Economic Development.

Books for reference

1. Roger Pearman&Yuema - Natural Resource and Environmental Economics - 1995Longman
2. Nick Hanley, Jason F Shogren, Ben White, 1999; Environment Economics in Theory andPractice – Mac Millan
3. Partha Das Gupta and Karl – Goral Maler – 1997; The Environment and emerging Development Issues – Vol 1

4. Allan Randal-Property Rights. Efficiency and the distribution of Income – Resource Economics Second Edition - John Wiley and Son
5. Climate change in Asia and Pacific, Venkatachalam Anbumozhi, Sage Publications
6. Prasad Modak and Asit. K. Biswas, 1999 - Environmental Impact Assessment for Developing Countries - Oxford University Press.

7. Environmental Valuation in South Asia, Haque, Cambridge University Press (ISBN-9781107007147)
8. World Bank — World Development Reports.

INDIAN ECONOMY

Unit I: Economic Development and its Determinants:

Features of Indian Economy – Indicators of Development – Human Development Index (HDI), Gender Development Index (GDI).

Unit II: Planning in India:

Meaning – Types and Models – Mahalanobis. Input-Output Multi sectoral Model – Planning Commission – Overview of Indian Five Year Plans – Eleventh Five Year Plan – Evaluation and Appraisal of Eleventh Five Year Plan – Twelfth Five Year Plan – Objectives.

Unit III: Agriculture: -

Implications of Land Reform – Technological changes in Agriculture – Pricing of Agricultural Products – Recent Trends in Agricultural Marketing – Second Green Revolution – Organic Farming Practices.

Unit IV: Industrial Growth in India

Performance of Textiles, Petro chemical and Information Technology Industry – MSME - Output and Employment of MSMEs - Policies and Programmes to remove disabilities of MSMEs– Liberalization, Privatisation – Globalisation.

Unit V: Infrastructure and Economic Development

Importance - Energy –Sources – Availability of Primary Energy in India –Energy Crisis – Measures Taken-Renewable Energy Potential –Power – Sources of Electric Power -Targets and Achievements –Rural Electrification - Education –Progress of Education in India -School – Higher Education- Technical Education – Vocational Education.

Books for references:

- 1 .Indian Economy, Dhingra I.C ,S.Chand and Sons Indian Economy, 2.Dutt and Sundharam, S.Chand and Sons, Planning Commission
- 3.EPW, Southern Economist
- 4.Economic Reform in India,Hope, Cambridge University Press (ISBN-9781107046047)
Strategies for Achieving Sustained High Economic Growth, The case of Indian States, Kaliappa Kalirajan, Richard T.Shand, Shashanka Bhide, Sage Publications(ISBN9788132104483
- 5.India Working:Essays on Society and Economy, White, Cambridge University Press(ISBN-9788175962309)

COMPUTER APPLICATIONS IN ECONOMICS

Unit I: MS Office and SPSS:

Overview – windows and Menus, Toolbars – Dialog Boxes – File Interface – Get File – Save out file – Export File – Import File – Data Processing using Excel.

Unit II: Data Entry: -

Basic Structure of an SPSS data file – Using data edition – Reading spread sheet data – Reading a database – Reading Text data.

Unit III: Data Definition: -

Preparation of Code Book, Data List, Begin Data, End Data, Defining Variable Type, Variable Tables, Value Labels, Missing Labels.

Unit IV: Data Transformation and Analysis: -

Statistical Techniques for Data Analysis. Frequency, Cross Tabulation, Correlation, Regression, Chi-Square, ‘t’ test, ANOVA.

Unit V: Out put Display: -

Interpretation of output – Transfer of data display formats – creating and Edition Graphs – Tables and Diagrams, Bar, Line, Pie, Scatter, Histogram.

Books for Reference:

Basic Readings List:

1. Gujarati, D N., (2012), Basic Econometrics (2nd Edition), McGraw Hill, New Delhi.
2. Krishnamurthy E V and Sen S K (1976), Computer Based Numerical Algorithms, Affiliated East – West Press, New Delhi.
3. Lipschultz, M and S Lipschultz (1981), Theory and Problems of Data processing, Schum’s Outline Series, McGraw Hill, New York.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI - 12

M.A. ENGLISH (CBCS) (FOR AFFILIATED COLLEGES)

FIRST YEAR SYLLABUS

(With effect from the academic year 2017 - 2018)

1. Objectives

The P.G. Course in English Literature and Language aims to

- equip the students with an in depth knowledge of a wide spectrum of genres and writers
- help them acquire communicative skills and a global perspective of English Language
- enable them to understand the multicultural context of English Language and Literature

2. Conditions for Admission

A candidate who has passed B.A. Degree Examination of M.S. University or any other university recognized by the UGC with Branch XII English as the Main subject of study shall be permitted to appear and qualify M.A. Degree in English.

3. Eligibility for the award of the Degree

A candidate shall be eligible for the award of the degree only if he/she has undergone the prescribed course of study for a period of not less than two academic years and passed the examinations of all the four semesters prescribed, earning 90 credits.

4. Duration of the Course

The duration of the course is for two academic years consisting of four semesters, each semester consisting of 90 working days.

The course of study shall comprise instruction in the following subjects according to the syllabus and books prescribed from time to time.

I Semester

Core Subjects:	Hrs	L	T	Credits
Modern Literature I	6	2	4	4
Modern Literature II	6	2	4	4
Romantic Period	6	2	4	4
Indian Writing in English	4	4	-	4
Literature and Gender (Elective I)	4	2	2	3
African Literature (Elective II)	4	2	2	3
Total (6 Courses)	30			22

II Semester

Core Subjects:	Hrs	L	T	Credits
Victorian Age and the Age of Hardy	6	2	4	4
Literary Theory and Criticism I	6	2	4	4
Indian Writing in English Translation	6	2	4	4
American Literature	4	4	-	4
Communicative English (Elective III)	4	2	2	3
Northeast Indian English Literature (Elective IV)	4	2	2	3
Total (6 Courses)	30			22

5. Examinations:

The examinations shall be of 3 hours duration for each paper at the end of each semester. The candidates failing in any subject will be permitted to appear for each failed subject in the subsequent examinations.

6. Scheme of Examinations:

Each paper contains an internal component. There is a pass minimum of 50% for external and overall components. External Examination is for 75 marks and the Internal Assessment carries 25 marks. The Examination paper consists of three sections- the first consisting of 10 questions 1 mark each; the second 5 questions of 5 marks each and the third 5 questions of 8 marks each with a total of 75 marks.

Section A $10 \times 1 = 10$

Section B $5 \times 5 = 25$

Section C $5 \times 8 = 40$

Each question offers an internal choice, set in an 'either or pattern'. The questions will cover all 5 units of each paper.

Internal assessment:

Regarding the Internal assessment, the 25 marks is allocated in the following manner.

	PG
The Average of the best two tests from three compulsory tests	15 Marks
Assignment	04 Marks
Seminar	06 Marks
Total	25 Marks

Note: Each test is of one hour duration.

M.A. English Syllabus

I Semester

Modern Literature I - Core I

(Chaucer to the Jacobean Age)

Hrs Credits

6 4

Unit - I

Geoffrey Chaucer	-	The Prologue to the Canterbury Tales In the beginning The Knight The Prioress The Clerk The Cook The Wife of Bath
Edmund Spenser	-	Prothalamion

Unit - II

Sir Thomas Wyatt	-	I Find No Peace
Henry Howard, Earl of Surrey	-	London, Hast thou Accursed Me

Unit - III

Lord Francis Bacon	-	Of Truth Of Adversity Of Friendship
The Bible	-	The Book of Esther

Unit - IV

Christopher Marlowe	-	Dr. Faustus
Thomas Kyd	-	The Spanish Tragedy

Unit - V

Ben Jonson	-	The Alchemist
Thomas Dekker	-	The Shoe Maker's Holiday

Modern Literature II - Core II**Hrs Credits**

(Metaphysical and Restoration Age)

6 4**Unit - I Poetry**

John Donne	-	Canonisation and The Extasie
John Milton	-	Paradise Lost Book IX

Unit - II Prose

Dr. Johnson	-	Life of Milton
Addison and Steele	-	Sir Rogers Family The Picture Gallery

Unit - III Poetry

Alexander Pope	-	"The Rape of the Lock"
Thomas Gray	-	"An Ode on a Distant Prospect of Eton College"

Unit - IV Drama

William Congreve	-	<u>The Way of the World</u>
Richard Brinsley Sheridan	-	<u>The School for Scandal</u>

Unit - V Fiction

Henry Fielding	-	Tom Jones
Oliver Goldsmith	-	The Vicar of Wakefield

Romantic Period - Core III

Hrs Credits

6 4

Unit - I Poetry

William Collins	-	Ode to Evening
William Blake	-	The Chimney Sweeper
William Cowper	-	On the Receipt of my Mother's Picture
Robert Burns	-	Highland Mary

Unit - Poetry

William Wordsworth	-	Resolution and Independence
John Keats	-	Ode to Autumn
P.B. Shelley	-	Ode to the West Wind
S.T. Coleridge	-	Kubla Khan

Unit - III Prose

Charles Lamb	-	Christ's Hospital
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William Hazlitt - The Southern Sea House
The Fight

Unit - IV Fiction

Jane Austen - Emma
Emily Bronte - Wuthering Heights

Unit - V Fiction

Sir Walter Scott - Kenilworth
Maria Edgeworth - Belinda

Indian Writing in English - Core IV

Hrs Credits

4 4

Unit - I Poetry

Rabindranath Tagore - Gitanjali (1,2,3,12 and 24)
A.K. Ramanujam - River
Agha Shahid Ali - Post Card from Kashmir
Dilip Chitra - My Father Returns Home
Jeyant Mahapatra - A Rain of Rites

Unit - II Prose

Rabindranath Tagore - Nationalism
Ananda Coomaraswamy - That Beauty is a State
B.R. Ambedkar - Extracts, 4 and 5 from Annihilation
of Caste

Unit - III Drama

Mahesh Dattani	-	<u>Final Solutions</u>
Mahashweta Devi	-	<u>Rudali</u>

Unit - IV Fiction

R.K. Narayan	-	<i>Painter of Signs</i>
Mulk Raj Anand	-	<i>Coolie</i>

Unit - V Fiction

Chetan Bhagat	-	<i>One Night @ the Call Centre</i>
Anita Nair	-	<i>Lessons in Forgetting</i>

Literature and Gender (Elective - I)

	Hrs	Credits
	4	3

Unit I Poetry

Sylvia Plath	-	Daddy The Arrival of the Bee Box Edge.
Imtiaz Dharker	-	Blessing Purdah 1 Battle-Line.

Unit II Drama

Ama Ata Aidoo	-	The Dilemma of a Ghost
Manjula Padmanabhan	-	Harvest

Unit III Fiction

- Toni Morrison - The Beloved
Doris Lessing - The Grass is Singing

Unit IV Non-Fiction

- Virginia Woolf - A Room of One's Own (Chapter IV).
Simon de Beauvoir - The Second Sex (Book I, "Facts and Myths").

Unit V Fiction

- Anita Brookner - Hotel Du Lac
Shobhaa De - Socialite Evenings

African Literature - Elective II

	Hrs	Credits
	4	3

Unit I - Poetry

- Julia Lithebe - "The Sunshine"
Neo Mvubu - "Mighty Eyes"

Unit II - Poetry

- Ben Okri - "A New Dream of Politics"
Christopher Okigbo - "Hurrah For Thunder"

Unit III - Drama

- Ama Ata Aidoo - Anowa

Unit IV - Fiction

Nadine Gordimer - *July's People*

Unit V - Fiction

Nuruddin Farah - *Sardines*

II Semester

Victorian Age and the Age of Hardy -Core I

Hrs Credits
6 4

Unit - I Poetry

Alfred Lord Tennyson - Lotus Eaters
Robert Browning - Rabbi Ben Ezra
Mathew Arnold - Dover Beach
D.G. Rossetti - The Blessed Damozel

Unit - II Prose

Thomas Carlyle - Heroes and Hero Worship (Lecture II
- The Hero as Prophet)

John Ruskin - Unto this Last

Unit - III

John Galsworthy - The Silver Box

J.M. Barrie - The Admirable Crinchtton

Unit - IV

Charles Dickens - David Copperfield

Charlotte Bronte - Jane Eyre

Unit - V

George Eliot - Silas Marner

Thomas Hardy - Mayor of Casterbridge

American Literature Core - II

Hrs Credits

6 4

Unit - I Poetry

Walt Whitman - When Lilacs Last in the Dooryard Bloomed

Emily Dickinson - Because I Could not stop for Death

Robert Frost - The Death of the Hired Man

Hart Crane - To Brooklyn Bridge

Langston Hughes - I, Too

Unit - II Prose

Ralph Waldo Emerson - The American Scholar

Henry David Thoreau - Civil Disobedience

Unit - III Short Story

Edgar Allan Poe - The Fall of the House of Usher

O. Henry - The Cop and the Anthem

One Dollar's Worth

Eudora Welty - A Visit of Charity

Unit - IV Drama

Arthur Miller - Death of a Salesman

Edward Albee - Who's Afraid of Virginia Woolf

Unit - V Novel

John Steinbeck - Grapes of Wrath

Saul Bellow - Seize the Day

Reference:

An Anthology: American Literature 1890 - 1965. Esbert S. Oliver

American Literature of the Nineteenth Century. An Anthology, William J. Fisher

Literary Theory and Criticism - I Core - III

Hrs Credits

6 4

Unit -I

Lionel Trilling's "The Sense of the Past"

Northrop Frye - "Criticism, Visible and Invisible"

Unit -II

Marxist Criticism: Christopher Caudwell – The Development of Modern
Poetry

Terry Eagleton - Capitalism, modernism and postmodernism

Unit -III

I.A. Richards – The Four Kinds of Meaning

F.R. Leavis – Literary Criticism and Philosophy

Unit - IV

Julia Kristeva - The ethics of linguistics 207

Luce Irigaray - The bodily encounter with the mother 414

Unit - V

Elaine Showalter: Feminist Criticism in the Wilderness

John Hillis Miller: The Critic as Host

Reference:

J.S. Rohan Savarimuthu. *Literary Theory and Criticism – Since 1830*

Harry Blamires. *A History of Literary Criticism*

V.S. Sethuraman ed. *Contemporary Literary Criticism: An Anthology*

The Critical Tradition: An Anthology of English Criticism II Volume Ed. by

S.Ramasamy and V.S.Sethuraman, Macmillan, 1978

Modern Criticism and Theory Ed.by David Lodge

Indian Writings in English Translation Core -IV

Hrs Credits

4 4

Unit - I Poetry

Subramania Bharathi - Panchali's Pledge Part I Canto I

Kumaran Asan - Uprightness, Psalm

Salma - On Borders

Unit - II Drama

K.A. Gunasekaran - Touch

Mahasweta Devi - Bayen

Unit - III Prose

P. Sivakami - Land: Woman's Breath and Speech

Rettamalai Srinivasan - A Brief History of My Life

Unit - IV Fiction

U.R. Ananthamurthy - Bharathipura

Prathibha Ray - Yajnasenei: The Story of Draupadi

Unit - V Short Story

Cho. Dharuman - Wetness

Rabindranath Tagore - Grandfather

Text Books:

The Oxford India Anthology of Tamil Dalit Writing edited by Ravikumar and R.

Azhagarasan, Oxford University Press, New Delhi, 2012

Bharathipura by U.R. Ananthamurthy, Translated from Kannada by Susheela Punitha, Oxford University Press, New Delhi 2010.

Yajnasenei The Story of Draupadi by Prathibha Ray, Translated from Odiya by Pradip Bhattacharya, Rupa Publications India Pvt. Ltd

Panchali's Pledge by Subramania Bharati. Translated by Usha Rajagopalan, Hachette India Publications.

Five Plays by Mahasweta Devi. Translated by Samik Bandyopadhyay, Seagull Publications, Calcutta, 1997.

Grandfather by Rabindranath Tagore. Selections from *Galpaguchha 2 Manikara and Other Stories*. Translated by Ratan K. Chattopadhyay. Orient Blackswan Private Limited, New Delhi, 2010.

<http://cpstudent.blogspot.in/011/04/55-english-translation-of-kumaran-asans.html>

<http://www.caravanmagazine.in/fiction-poetry/four-poems>

Communicative English - Elective III

Hrs	Credits
4	3

Unit - I

Successful Communication

- 1) Communication: Significance and Importance
- 2) Effective Communication: Procedure and activity

Unit - II

Group Discussion - Definition and Characteristics of group discussion

Interview Skills - Introduction and Preparation

Unit - III

E-Skills

- 1) Comprehension of e-communication
- 2) Online Career Skills
 - (a) Curriculum Vitae
 - (b) Video Conferencing
 - (c) e-advertising
 - (d) e-marketing

Unit - IV

Speech

- 1) Purpose and Strategies of a Speech
- 2) Body Language

Unit - V

Critical Skill

Evaluating arguments / Expressions / Feedback / Analysis

Reference:

S.K. Mandal. *Effective Communication and Public Speaking*

K.R. Lakshminarayanan. *Advanced English Communication Skills Lab*

P. Kiranmani Dutt, Geetha Rajeevan, C.L.N. Prakash. *A Course in Communication Skills*

Northeast Indian English Literature - Elective IV

	Hrs	Credits
	4	3

Unit - I Poetry

Thangjam Ibopishak - "Volcano You Cannot Erupt"

Desmond L. Kharmawphlang - "Last Night I Dreamed"

Unit - II Poetry

Saratchand Thiyam - "Sister"

Temsula Ao - "Stone-People from Lungterok"

Ilabanta Yumnam- "Barak River You Are Beautiful"

Unit - III Short Stories

Arnab Jan Deka - 1. "Three Village Girls"

2. "An American Mother"

3. "Himalayan Mystic Meeting"

Unit - IV Fiction

Mitra Phukan - *The Collector's Wife*

Unit - V

Easterine Kire - *Mari*

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.A. (History)

(Choice Based Credit System)

(With effect from the academic year 2017-2018 onwards)

Sem . (1)	Sub. No. (2)	Subject Status (3)	Subject Title (4)	Contact Hrs./ Week (5)	Credits (6)
I	1	Core	History of Tamil Nadu upto 1565 AD	6	4
	2	Core-2	History of India upto 712AD	6	4
	3	Core-3	History of Europe from 476 to 1453AD	6	4
	4	Core-4	History of world civilization upto 1453AD	4	4
	5	Elective-1	Principles and Methods of Archaeology	4	3
	6	Elective-2	Indian Public Administration since 1947	4	3
	Subtotal				30
II	7	Core-5	History of Tamil Nadu from 1565 to 1987AD	6	4
	8	Core-6	History of India from 712 to 1765 AD	6	4
	9	Core-7	History of Europe from 1453 to 1789AD	6	4
	10	Core-8	History of England upto 1688 A.D	4	4
	11& 12	Elective-3 & 4 (select any two)	History of Russia from 1689 to 1964AD	4	3
			History of Japan upto 1965	4	3
			History of the Arabs from 570 to 1258AD	4	3
Subtotal				30	22

HISTORY OF TAMIL NADU UPTO 1565AD

Objectives: To acquaint the students about the ancient Tamil Kings who ruled over this land with the unique culture and language.

Unit: I

Geographical features and the Sangam Age:

Geographical features of Tamil Nadu- Sources : Literary , Archaeological- Race, Language and Religion- the Sangam Age:- Main sources- Sangam works- The Age of the Sangam – Political history – Kadal Pirakkottiya Senguttuvan - KarikalaChola- TalayalanganattuNedumselivan- Subordinate chieftains. Sangam culture- Administration- Economy- Cultural life.

(11L)

Unit: II

The Kalabhras and ThePandyas:

The Kalabhras: Origin of theKalabhras- Effects of Kalabhra rule on the Tamil country- The first empire of the Pandyas: Sources- Political achievements: Kadungon to ViraPandya- Pandya contribution to government, Art and Architecture- Cave architecture.

(12L)

Unit: III

The Pallavas and The Cholas:

Origin of thePallavas- Imperial Pallavas- Mahendravarman I- Narasimhavarman I-Other rulers-The PandyaPallava conflict–Contribution of Pallavas to Art and Architecture,Culture- Administration, Socio-economic life-Religious condition- The Cholas:TheVijayalaya Line of Cholas:Parantaka I- Rajaraja I - Rajendra I - Chalukya Cholas: Kulottunga I-KulottungaIII- The Chola administration- Contribution to Literature- Art and Architecture-Socio-economic life – Culture-Internal and external trade- Religious condition.

(15L)

Unit: IV

Pandyas and the Muslim invasions:

Pandyas of the second empire – Political History-Administration and Social life- Contribution to Art and Architecture– Revenue Policy of the later Pandyas-Muslim Invasion of South India- Invasion of Malik Kafur-Rise of Madurai Sultanate- Impact of Muslim Rule.

(10L)

Unit: V

Foundation of Vijayanagar Empire:

Rise of the Vijayanagar kingdom- Origin-Kumara Kampanna’s Southern Expedition- Tamil Country under Vijayanagar Empire-Krishna Devaraya-Battle of Talikota -Impact of the Vijayanagar Rule - Administration – Social and Economic conditions- Contribution to Art and Literature.

(12L)

(Total: 60L)

Text Books:

1. Krishna Murti V.M- “History of Tamil Nadu”, Vijyalakshmi Publications.
2. Nilakanta Sastri K.A- “A History of South India”, Swathi Publications, 11-A Sriramanagar North st, Madras 18.
3. Subramanian-“History of Tamil Nadu”, Kudal Publishers 217-A, South Masist, Madurai-I.

Books for Reference;

1. Mahalingam T.V - Reading in South Indian History
2. Neelakanda Sastri K.A -The Cholas
3. Neelakanda Sastri K.A -The Pandya Kingdom
4. Pillai.K.K-Social History of the Tamils
5. Rajayyan.K-History of Tamil Nadu p.t. 1
6. Srinivasa Aiyangar P.T-The History of the Tamils
7. Subramanian N- The Sangam Polity , Madurai.

HISTORY OF INDIA UPTO 712 A.D

Objective: To create awareness and understanding of the rich Indian culture and heritage.

Unit: 1

Pre-Historic Period:

Physical features of India – Sources of Ancient Indian History – Literary Sources–Indigenous and Foreign Accounts – Archaeological sources, Life of people in the Pre-historic Times: Paleolithic Age – Neolithic Age – The Age of Metals.

(7L)

Unit: II

From Harappan Culture to Aryanisation:

Harappan culture: Indus Valley Civilization – Centers of Civilization – Date - Town planning – Art and Architecture – Indus script – Social and Economic Life of the people – Religion. Fall of the Harappan culture. Vedic culture: Origin of Aryans – Early settlements and expansion – Rig Vedic society, polity and religion, Vedic literature. Later Vedic Age : Social, Economic and Religious life.

(11L)

Unit: III

North India from 600-325 BC:

Mahajanapadas - Rise of kingdoms and Republics– Rise of Magatha and Nandas. Life of the people - Four Ashrams - Factors for the rise of new religions - Buddhism – Buddha’s Teachings – The four Buddhist Councils – Schism in Buddhism: Mahayanism and Hinayanism – Spread of Buddhism – Legacy of Buddhism. Jainism: Life of Mahavira - Teachings of Jainism – 24 JainaThirthankaras – Jain Councils – Spread of Jainism - Schism in Jainism - Legacy of Jainism. Persian and Greek Invasions.

(12L)

Unit: IV

Rise of Empires - I Phase:

Rise of Mauryan Empire: Sources – Chandragupta Maurya– Megasthenes - Ashoka – Kalinga war - Asoka’s Dharma – Ashokaand Buddhism – Ashoka’s Edicts – Fine Arts, Education, Literature under the Mauryas - Mauryan Administration. The Kushan Empire: Kanishka, His conquests and religion – Contact with outside world - Coinage – Architecture - The Gandhara School of Art, and Mathura School of Art.

(15L)

Unit: V

Rise of Empires- II Phase:

The Guptas: Sources – Chandra Gupta I - Samudra Gupta – Fa-hien and his Account of India - Chandra Gupta II – conquests – Gupta administration – Economic condition – Coinage of Guptas – Golden Age of the Guptas – Guptas in the field of Literature, Art and Architecture – Science - Ajanta Paintings – Education and Educational Institutions - HarshaVardhana: Hiuen Tsang’s account of India. India on the eve of Muslim invasion – Arab conquest of Sindh and its effects.

(15L)

(Total: 60L)

Text Books:

1. Hans Raj :”History of Ancient India”, Surjeet Publications, the Kholapur road, Kamla Nagar , Delhi -7.
2. Kundra D.N –History of India- Navdeep Publications.-3623,Chauri Bazaar ,Delhi
3. Khurana - History of India from the Earlies Times to 1206 A.D

Books for reference:

1. Agraval. D.P. and ChakrabartsD.K - Essays in Indian Proto History
2. Atlekar A.S - State and Government in Ancient India.
3. Basham A.L - The Wonder that was India.
4. Beni Prasad - Theory of Government in Ancient India.

5. Chopra.P.N.(Ed) - India Pre-historic and Protohistoric
6. Majundar, R.C. (Ed) - The History and culture of Indian
People. Vol.I(Vedic age) Vol. II (The Age of Imperial unit)Vol.III (Classical age)
7. NilakantaSastri, K.A - History of India Vols. I & II
8. Ray chaudhri, Hem Chandra, Political History of Ancient India.
9. RomilaThapar - History of India Vol. I.
10. Sankalia H.D - Pre and Proto History in India and
Pakistan.
11. Sathianathaier, R -A Political and cultural History
of India.
12. ShereenRatnagar -Understanding Harrappan civilization in
the Greater Indus valley.

HISTORY OF EUROPE (476 -1453 A.D)

Objective: To appraise the Historical significance of pre-modern Non Western culture.

Unit: I

Brief Survey of Europe after 476 A.D:

Fall of Western Roman Empire-Occupation of Western Europe by Barbarians- The Ostrogoths- The Visigoths – The Vandals- The Franks- The Anglo- Saxons- The Burgundians- The Lombards. The Byzantine Empire: ConstantineI (324-337)- Theodosius I(379-395)-Justinian I (527- 565)-Contribution-Byzantine Culture- Rise and spread of Christianity- Rise and spread of Islam.

(10L)

Unit: II

The Frankish Kingdomto the Capetian Kings of France:

Clovis I(481-511)-Charles Martel(719-741)- Charlemagne(768-814)- The state after Charlemagne- Carolingian Renaissance-Divine Right of Kings – Feudalism: Rise and Development – Features –Decline- Manorial System. The Capetian Kings of France- Hugh Capet(987-996)- Philip II Augustus- Louis IX- The later Capetian Kings.

(15L)

Unit: III

The Church and the State:

The Papacy- Monasticism- The Cluniac movement- The Holy Roman Empire-Henry the Fowler-Otto the Great- Struggle between the Empire and Papacy(1049-1250)-Investiture Conflict-Gregory VII and Henry IV-Frederick Barbarosa – Frederick II-Their Relations with the Pope-Frederick II's place in Medieval History-Innocent III-Religious Policy –Relations with European Kings.

(15L)

Unit: IV

Holy and Political Wars:

The Crusades (1095-1271) – Causes for the failure- Results- The Hundred Years War(1337-1453)- Causes - Course – Causes for the Success of the French-Results.

(10L)

Unit: V

Life and Society in the Middle Ages:

Church Life- Medieval Economy- Growth of Commerce- Growth of Towns and Trade Guilds. Intellectual development and the Rise of Universities- Art and Architecture in the Middle Ages- Society at the end of the MiddleAges. Capture of Constantinople in 1453.

(10L)

(Total: 60L)

Text Books:

1. George Holmes (Ed) – The Oxford illustration History of Medieval Europe, Oxford University press.
2. Robert S. Hoy and Stanley Chodorow- Europe in the Middle Ages.
3. NilakantaSastri- Essentials of world history.

Books for reference:

1. Baynes.N.H and Moss.L.B- Byzantium an introduction to East Roman civilization.
2. Fisher H.A.L - A history of Europe from the beginning to 18th C. Vol.I and II.
3. Joseph R. Strayer and Dana c Munro - ‘The Middle Ages , 295-1500AD’
4. Martin Scott - Medieval Europe.
5. Michael Frassetto - Early Medieval World from the Fall of Rome to the times of Charlemagne.
6. Swain.J.E - A History of World Civilization.
7. Wallace K Ferguson and GeoffreyBrun- Survey of European Civilization.K.CChowdray, New Central Book Agency, Calcutta.

HISTORY OF WORLD CIVILISATION UPTO 1453

(EXCLUDING INDIA)

Objective: To acquaint the students about the contribution made by the World civilizations to the total heritage of mankind.

Unit: I

Life in Pre Historic Times:

The Origin of Life – Factors that favoured the origin and development of civilization. Pre Historic Man – Palaeolithic Age – Neolithic Age – Bronze Age – Iron Age – Human Races and their Movement.

(8L)

Unit:II

Bronze Age Civilization:

Mesopotamia: Sumerian Civilization – Important cities. Royal cemetery – Sargon the Great of Akkad – Social and Economic Life – Sumerian Law and Religion – Babylon and its Empire's : Hammurabi the Great –The code of Hammurabi – Nebuchadnezzar II – Architecture – Religion – Literature and Learning. Assyrian Rise to Power : Expansion –wars – Chaldeans. Egyptian civilization: The first king or pharaohs – Contribution to religion, art, architecture, Maths and Medicine – Chinese civilization – The land and the People – Political Institutions – Economic and Social Developments – Arts – Religion and Philosophy – Literature and Learning.

(15L)

Unit:III

Early Iron Age civilization:

The Iranian Civilization: Cyrus the Great – Darius the Great – Social – Economic and Religious condition – Art and Architecture. The Greek Civilization: City States – War between Athens and Sparta –Contribution to World Civilization – The Roman Civilization:

MSU / 2017-18 / PG –Colleges / M.A. (History) / Semester –I / Ppr.no.4 / Core -4

Monarchy – Early Republic – Rise of Dictatorship – Julius Caesar – The Golden Age of Augustus – Contribution of the Romans.

(15L)

Unit: IV

Medieval Period:

Byzantine – Government – Art – Religion and Philosophy – Literature – Justinian code – St.Sophia – Importance of Byzantine civilization – Christianity – Role of the Church – Services of the Church– Monasteries – Papacy – Contribution of Papacy to World Civilization.

(10L)

Unit: V

Rise of Towns and Cities:

Factors favourable to the growth of Towns – Medieval Guilds – Contribution of Towns – Constantinople the bulwark of Eastern Europe –Fall of Constantinople – Genesis of Renaissance – Genesis of Reformation.

(12L)

(Total : 60L)

Text Books:

1. J.E Swain-“A History of World Civilization”-Eurasia Publishing House pvt,Ramnagar,New Delhi.
2. Majumdar R.K –“History of World Civilization”

Books for reference:

1. Arnold J.Toynbee - A Study of History Western
2. Burns. E.M - World Civilization
3. Davies. H.A - An outline of the History of the world.
4. Harrison F - Byzantine History in the Early Middle age.
5. Shunghal. D.P - India and World Civilization
6. Sri Vastva. A.N,Mujumdar. K.K. - History of World Civilization
7. Starr.C.G - A History of the Ancient World.
8. Wildurand - History of Civilization

PRINCIPLES AND METHODS OF ARCHAEOLOGY

Objective: The study enable the students to know the Human activity through the recovery and analysis of material culture.

Unit: I

,An introduction of Archaeology:

Definition - History and Archaeology - Pre - historic and Historic Archaeology - Kinds of Archaeology - Environmental Archaeology, Ethno Archaeology and Historical Archaeology - Value of Archaeology as a primary and Supplementary evidence.

(12L)

Unit: II

History of Archaeology in the world:

Classical Archaeology - Antiquarianism. Rosetta Inscription - Henri Schliemann - Thomas Jefferson. Thompson -Development of New Archaeology - Processual and Post Processual Theory - Flinders Petrie -Pitt Rivers - Gordon Childe - History of Archaeology in India - Asiatic Society - Sir William Jones - Alexander Cunningham - Archaeological Survey of India. Sir John Marshall - Sir -Mortimer wheeler - Exploration : Folk traditions - Field survey - Magnetometer - Comparative study - Ariel Photography.

(12L)

Unit: III

Excavation Methods:

Site survey - Geophysical Survey Excavation : Methods of Excavation, Horizontal Excavation, Burial Excavation.

(12L)

Unit: IV

Archaeological Recording:

Land Survey - Topographical Survey - Stratigraphy and its importance - Three Dimensional Recording - Drawing Photography - Cataloguing -Conservation methods, Metal Bone - Archaeology and other sciences.

(12L)

Unit: V

Dating Methods in Archaeology:

Relative Dating.Absolute Dating - Radio Carbon Dating (C14Dating) -Dendrochronology - Archaeomagnetism - Potassium Argon Method - Fluorine Test - Nitrogen Test - Pollen Test.

(12L)

(Total: 60L)

Text Books:

1. Clive, Gamble - Archaeology: The Basics
2. Raman, K.V - Principles and Methods of Archaeology.

Books for reference:

1. Barkar, Philip - Techniques of Archaeological Excavation.
2. Colin Renfrew - Archaeology: theories, Methods and Practices
3. Harris, Edward C - Principles of Archaeological Stratigraphy
4. Hester R. Thomas ,Shafer - Field method in archaeology
5. Robert J Sheer - Fundamentals of archaeology
6. Sankalia .H.D - New Archaeology – The Scope and application in India

INDIAN PUBLIC ADMINISTRATION

SINCE- 1947

Objective: To Promote well informed and intelligent citizens, to have the ability to participate in the affairs of the Nation effectively.

Unit: I

Constitutional Frame work:

The Indian Constitution – Preamble – Salient Features – Fundamental Rights – Directive Principles – Union Government: President – Prime Minister–Parliament – Judicial Organization – State Government: Chief Minister Governor – State Assembly – Centre -State Relations – Union Territories and Administration.

(12L)

Unit: II

Administrative Framework:

Cabinet Secretariat – Duties and Responsibilities – Cabinet Committees – Function – Prime Minister’s Office – Role and Function. Central Secretariat – Functions – Executive Agencies – Growth and development of Departments in India - Ministry of Finance – Ministry of Home Affairs – Ministry of Personal – Ministry of External Affairs – Attorney General of India – Comptroller and Auditor General of India.

(12L)

Unit: III

Administrative Relations:

Bureaucratic Administration – Public Service and Civil Service – All India Services – Central Services – UPSC – Recruitment and Training – Grant-in-Aid – Inter State Council – Planning Commission – NITI Aayog–National Development Council – Zonal Council – Administrative Reforms: Important – Commissions and Committees – Election Commission.

(12L)

Unit: IV

State Administration:

Structure – State Secretariat – Chief Secretary – State Public Service – TNPSC – State Service – Regional Divisional Commissioners – District Administration - District Collector – Various Departments of the District – Law and Order – National Police Commission (1977).

(12L)

Unit: V

Decentralized Administration:

Corporations: Major Municipal Corporations – Powers and Functions, Municipalities - Powers and Responsibilities – Elections – District Development Council – Panchayat Raj Administration – Structure – Gram Sabha – Gram Panchayat – PanchayatSamiti-ZilaParishad.

(12L)

(Total: 60L)

Text Books:

1. ShriramMaheswari - Indian Administration (New Delhi: Orient Longman, 1993
2. Venkatesan - Public Administration., V.C. Publications, Rajapalayam.

Books for reference:

1. Biju M.R.(ed) - Financial Management of Panchayat Raj Sysytem
2. BhaktapadaSinha Raj - Panchayat Raj Institutions and rural Development
3. Chaturvedi T.N -Organizationof Government of India (New Delhi1985).
4. Garg H.P. - Indian Government and Politics
5. Gupta D.C. - Indian Government and politics, Vikas publishing House.
6. Inamdar - Development Administration in India
7. Maheswari S.R - The Administrative Reforms Commission (New Delhi: Atmaram, 1982).
8. Rakesh Prasad - Panchayatraj in Action.
9. Singh.D.P. - Problems of Public Administration inIndia (Delhi: Chand & Co.,1980).
10. Srivastva L.N - Constitutional History of India and National Movement.

HISTORY OF TAMIL NADU -1565-1987

Objective:To enable the students to grow as a responsible citizen in a democratic society

Unit: I

Tamil Nadu under the Nayaks and Sethupathis:

Sources for the Nayak History-Rise of the Nayaks – Senji – Krishnappa Nayak, Madurai – Thirumala Nayak, Thanjavur – Ragnatha Nayak - Decline of the Nayaks-society, religion, art and architecture. The Sethupathis: Thirumala Setupati – Kilavan Sethupathi – Muthuramalinga Sethupathi.

(12L)

Unit: II

Tamil Nadu under the Marathas and Nawabs:

Maratha conquest on Tamilaham – Venkoji – Shivaji – Shaji – Serfoji – Tukkoji – Socio-Religious – Cultural and Education conditions under the Marathas. Nawabs of Arcot – Chanda Sahib, Mohammad Ali, Maphuz Khan, Khan Sahib-Administration and society under the Nawabs.

(12L)

Unit: III

Tamil Nadu under the British:

The Europeans on the Coromandel – Anglo French conflict in the Carnatic – Carnatic Wars- Administrative Reforms of the English- Revenue Administration- Judicial Administration- Dyarchy- Administration of the Justice party- Growth of Education- Role of Christian Missionaries- Wood's Despatch- Hunter Commission- Macalay's Minutes..

(12L) **Unit: IV**

Freedom movement in Tamil Nadu:

Earlier Attempts- Puli Thevar- Virapandya Kattabomman- Poligar Rebellion- South Indian Rebellion- Vellore Mutiny- Swadesi Movement- Non Co-operation movement- Civil Disobedience Movement - March to Vedharanyam- Quit India Movement- V.O. Chidambaram Pillai- V.V.S Iyer – Vanchinathan- Subramania Bharathi- Rajaji and Sathyamurthi- E.V.R- Self Respect Movement.

(12L)

Unit: V

Tamil Nadu in free India:

Congress Administration-Kamaraj- Anti-Hindi Agitation of 1965-Rise of DMK - DMK in power-C.N Annadurai- M.Karunanidhi- Rise of AIADMK- AIADMK in power – M.G Ramachandran and Administrative reforms-Death of M.G.R.

(12L)

(Total: 60L)

Text Books:

1. N.Subrahmanian- - “History of Tamil Nadu A.D 1565-1956”, Koodal publishers
2. Rajayyan K -“History of Tamil Nadu (1565-1982)”,Raj publishers- Madurai 21.

Books for reference:

1. Bakker C.J. -The Politics of South India
2. Krishna Pillai A. -Tamil Nadu under Vijayanagar.
3. MuraliMaran- Dravidian Movement
4. Rajayyan K - South Indian Rebellion
5. –do- - Rise and fall of the Poligars of Tamil Nadu
6. –do- - Real History of Tamil Nadu upto 2004.
7. Thandavan.R - The Dravidian Movement
8. Thirunavukkarasu -DravidaIyakkaVerkal
9. Visswanathan E.S -The Political Career of E.V. RamasamiNaickar
10. YesudhasonV.IssacJeyadhas -History of Tamil Society and Culture Since 1336

HISTORY OF INDIA

A.D. 712– 1765

Objective:To imbibe in the minds of the students a deep and intense feeling of Nationalism and Love for the Country.

Unit: I

Sources and Turkish Invasions:

Sources: Archaeology – Monuments, Inscriptions, Coins – Literature – Court Historians – Foreigners - The Turkish conquest of India: Political Social Economic background Sabuktigin, Mohammad of Ghazni –Indian expeditions – Muhammad Ghori’s invasion on India –Battle of Tarains – effects.

(7L)

Unit: II

Delhi Sultanate:

Slave dynasty: (1206-1290) - Qutb-ud-din Aibak – Iltumish – Razia Begum – Balban – Khilji dynasty: (1290 – 1320) - Ala-ud-din khilji.Tughlaq dynasty: (1320-1412) –Ghiyas-ud-din Tughlaq Mohammad- Bin-Tughlaq– FerozTughlaq - Invasion of Timur - – Decline of Tughlaq Dynasty – Sayyid Dynasty (1414-1451) - Lodi dynasty(1451-1526) – Bahlol Lodi - Sikandar Lodi – Ibrahim Lodi –Administration-Art and Architecture-Education, Literature and Society- Decline of Delhi Sultanate.

(15L)

Unit: III

Mughal Empire:

Sources– Babur – Humayun – Shersha – Akbar – Jehangir – Nurjahan – Shahjahan- Aurangazeb– Mughal Administration- Social and economic conditions-Art and Architecture-, Deccan Policy- Frontier Policy -Decline and disintegration of Mughal Empire. (15L)

Unit: IV

Rise and fall of the Marathas:

Shivaji and his successors- Maratha Mughal relations- Maratha Expansion under Peshwas- Rise of the Peshwas- BalajiVishwanath – BajiRao I- BalajiBajiRao. Defeat of the Marathas.Invasion of Nadir Shah and Ahmad Shah Abdali.Third battle of Panipat.

(12L)

Unit:V

Establishment of British rule in India:

Advent of the Europeans-Trading Centres of European companies in India -Competition and Rivalry-Carnatic Wars –British Supremacy in Bengal-The Battle of Plassy and Buxar-The Treaty of Alahabad(1765).

(11L)

(Total: 60L)

Text Books:

1. Iswari Prasad – History of Medieval India.
2. NilakantaSastri. – Advanced History of India

Books for Reference:

1. Bongard Levin, et. al – History of India, Vol.II.
2. Edwards and Garret – Muslim Rule in India
3. Habibullah, N.M.S. – Foundation of Muslim Rule in India.
4. IrfanHabib – Medieval India.
5. Majumdar, R.C., ed – History and Culture of Indian People,
6. Mohammad Habibed – Comprehensive History of Delhi Sultanate.
7. Ranade ,M.G – Rise of the Maratha Power.
8. SanghMittra – Medieval Indian History
9. Sathiyanaithaier, R. – Political, Cultural History of India Vols. I and II
10. Sewell, R. – Forgotten Empire of India.
11. Sherwani – The Bahmanis of Decan
12. Smith, V.A. – The Oxford History of India.
13. Sharma S.R – Mughal Empire in India
14. Tripathi,R., – Rise and Fall of the Mughal Empire

HISTORY OF EUROPE(1453-1789)

Objective: To understand the Legacy of the Middle Ages in Europe and to appreciate the beginnings of Modern Europe.

Unit: I

Europe in the 15th and 16th centuries:

Geographical Explosion of Spain,Portugal,England and France-Effects-Renaissance in Europe- Factors aiding the flowering of Renaissance-Renaissance in Italy-,Germany,Spain,England- Renaissance in art, architecture, sculpture,paintings,drawings and science. (12L)

Unit: II

Reformation:

Religious reformation- Decline of the Catholic Church and Papacy- The Rise of Humanist movement- Spread of secular attitude – Rise of Nationalism- Lutheranism in Germany- Protestantism in Switzerland-Anglicanism- Results of the Reformation- Counter Reformation (12L)

Unit: III

Emergence of Nation States and National Monarchs:

Causes for the rise of Nation States-Royal absolutism- England:Henry VII, Henry VIII,Edward VI, Elizabeth I- Spain: Ferdinand, Charles V,PhilipII - France: Louis XI,Charles VIII, Francis I,Henry IV. (12L)

Unit: IV

The Last Religious and the First Political War:

The Importance of religious , dynastic, and economic issues of Thirty years war- Different Periods of the Thirty years War-Peace of Westphalia – France under Richelieu and Mazarin- Rise of Sweden- GustavusAdolphus. (12L)

Unit: V

Age of Enlightenment:

Louis XIV of France- Peter the Great and Catherine II of Russia, Frederick William and Frederick William the Great of Prussia, Maria Theresa and Joseph II of Austria, Europe on the eve of French Revolution.

(12L)

(Total: 60L)

Text Books:

1. Mukharjee L – A study of European History(1453-1815),M.L Mukharjee Publications, Kolkata.
2. Kurana K.L- Modern Europe(1453-1789)

Books for reference:

1. BaintonRolend H -The age of Reformation
2. Elliot J.H - Europe Divided 1559-1598
3. Gindeley, A .- History of the Thirty years Wars.
4. Grant A.J - History of Europe 1495-1610
5. Grimm , Herold - The Reformation Era
6. Hughes Philip - A Popular History of the Reformation
7. Thomson, S. Harrison - Europe in Renaissance and Reformation.
8. RadheyShyam - World History.
9. Rao.B.V - History of Europe 1450 to 1815AD.

HISTORY OF ENGLAND UPTO 1688 A.D

Objective:It enable the students to know about the true nature of the past history of England and how it overcame its obstacles that impede its progress.

Unit: I

The Pre- Norman period:

Roman Conquest of Britain- Effects – Legacy of Rome in Britain-The Teutonic tribes-Spread of Christianity – Effects.Alfred the Great. Golden Age of the Saxons .The English life on the eve of the Norman Conquest.

(10L)

Unit: II

The Normans and the Plantagents:

Norman Conquest of England by William I the Conqueror- Political , Social, Economic and Religious changes after the Conquest – William II- Henry I-Stephen. Plantagents: Henry II – Richard I – John-The Magna Carta- Henry III and the Mad Parliament – Edward I’s Reforms and the Model Parliament- Hundred years War-Edward III’s Reforms and development of Parliament- Richard II.

(15L)

Unit: III

The Lancastrian Kings and the Tudors:

Henry IV to Henry VI- The wars of the Roses- Lancastrian experiment of Parliamentary government.The Yorkist Kings- Origin and development of Parliament from 13th to15th centuries.Henry VII- Henry VIII- His church policy and fall. Edward VI- Mary Tudor – Elizabeth, Relations of the Tudors with Parliament.

(15L)

Unit: 1V

Stuart Period:

James I- Struggle between James I and his Parliments- Charles I –His First Three Parliaments- The Long Parliament – The Great Civil War- The Common wealth and the Protectorate.

(10L)

Unit: V

The Restoration and the Glorious Revolution:

Charles II and Restoration –Convention Parliament- Cavalier Parliament – Different Ministries of Charles II.Growth of Privy Council during Charles II. James II- Glorious Revolution – Circumstances – Significance.

(10L)

(Total:60L)

Text Books:

1. Srivatsva L.N – Constitutional History of England.
2. Woodward E.L- “A History of England”,B.IPublications, Madras.

Books for reference:

1. Edward and Goratte - History of England.
2. Joug - History of England
3. King’s Publications -History of England(1485-1945).
4. Lloyd.T.O -The British Empire 1558 to 1983
5. Ransay Muir -History of England.
6. Rao B.V - History of Europe(1450-1815)
7. VidyaDharMahajan -England since 1485

HISTORY OF RUSSIA-1689A.D-1964

Objective: To enable the students to know about the importance of Russia to the World.

Unit: I

The Ascendancy of Russia:

Ivan IV the terrible- Romanov dynasty-Peter the great(1689-1725)- Peter's Reforms- St.Petersburg- Russia's foreign policy, Catherine the great- Domestic reforms- Administrative reorganization- Economic Policies- Foreign policy-Paul 1796-1801 Society and culture in the 18th century.

(10L)

Unit: II

Russia from 1801 to 1881:

Alexander I (1801-1825)- Nicholas I (1825-1855)- Alexander II (1855-1881) -abolition of Serfdom- Judicial reforms – Zemstvos- Polish revolt- Foreign policy.

(5L)

Unit: III

Russia and the world:

Alexander III (1881-1894)- Nicholas II(1894-1917) Nihilism in Russia- the Russo- Japanese war (1904-1905)- Treaty of Portsmouth- Impact- Revolution of 1905-. The Russian Duma (1906-1914).

(13L)

Unit: IV

Russia between the First and Second World Wars:

Role of Russia in the First World War- February Revolution of 1917- Bolshevik Revolution of October 1917 -Impact of the Russian Revolution and the success of Socialism- Russia under Lenin and Stalin- USSR in World War II- The Aftermath of the War.

(17L)

Unit: V

The Khrushchev Era (1953-1964):

Domestic policies- Agriculture- The Soviet Economy- Foreign policy of Soviet union- Soviet union and Eastern Europe Sino- Soviet Relation- Soviet Relation with western powers- Cold war and military alliances- Effects of the cold war soviet Impact on the war : Political Impact- Ideological Impact- Impact on International Relations.

(15L)

(Total: 60L)

Text Books:

1. ManoharR.Wadhvani- ‘‘Rise of Soviet to world power’’, S.Chand and Company Ltd. Ram Nagar, New Delhi.
2. N.Subramanian- ‘‘History of Russia. As Ennes Publications,96, NGO colony, Madurai.
3. Majumdar.R.K and Srivastva.A.N-History of Russia

Books for reference:

1. Basil Dmytryshyn -A History of Russia
2. Carr.E.H -The Russian Revolution from Lenin to Stalin.
3. Chaurasia R.S - World History
4. King’s Publishers - History of Russia and USSR.
5. Kristine Bushnell -History of the USSR vol. I and II.
6. Rao.B.V - History of Europe 1450-1815. Sterling Publishers pvt Ltd.
7. VidyaDharMahajan -‘‘History of Modern Europe since 1789
8. Vinay Kumar Malhotra-Gorbachevian Revolution in the Soviet union.

HISTORY OF THE ARABS

A.D. 570 TO 1258

Objective: It enables the students to familiarise with the various aspects of Islam and the history of the rise and establishment of Islamic Civilization.

Unit: I

Pre- Islamic Arabia and Muhammad Prophet:

Arabia – The cradle of the Semitic race – Mecca, Kaaba, the Quraysh – The Abyssinian – Geographical condition – The age of Ignorance (Jahiliya period) – Arab Kingdoms – Prophet Muhammad’s Life and Teachings – Kuran – The book of Allah – Islamic doctrines and beliefs – Five pillars of Islam

(12L)

Unit: II

Early Caliphs and the expansion of Islamdom:

The Orthodox Caliphate – Pious Caliphs, Abu Bakar, Umar, Uthman and Ali – Expansion and colonization – Administration under the orthodox Caliphs – Struggle between Ali and Muawiah and the fallout.

(12L)

Unit: III

Umayyads:

Umayyad Caliphate (661-750) – The Umayyad Caliphs – Golden Zenith of the Umayyads – Umayyad Administration – Socio cultural condition under Umayyads – Decline and fall of Umayyads.

(12L)

**MSU / 2017-18 / PG –Colleges / M.A. (History) / Semester –II / Ppr.no.11 & 12 /
Elective -3 & 4 (b)**

Unit: IV

Abbasids:

Abbasid Caliphate, Abbasid Caliphs (750-1258) – The Abbasid State and Society – Scientific and Literary Progress under Abbasids – Golden prime of the Abbasids – Fall of Abbasid dynasty.

(12L)

Unit: V

Arabs in Spain and Egypt:

Islam in Spain – Cultural Progress in Islamic Spain – the Fatimids of Egypt – Administration, society and culture under Fatimids.

(12L)

(Total:60L)

Text Books:

1. Philip K Hitti-“The History of the Arabs”
2. S. Selvin Kumar-“The Medieval Arabs”

Books for reference:

1. Ali K. – A Study of Islamic History
2. Ameer Ali – History of Saracens
3. Arnold T.N. – Caliphate
4. AtharHussian – The Glorious Caliphate
5. KhudaBaksh – History of the Islamic Civilization
6. Muir W. – The Caliphate: Its Rise, Decline and Fall
7. Zaiden J. – Omayyads and Abbasids

First Year : II Semester

Elective paper

History of Japan upto 1965

Objective : to inculcate that hard work of the people of Japan made them to recover from the disaster of the second world war and to become the most prosperous modern state in Asia.

UNIT : I

Early History of Japan:

Geographical Features -Historical background-Origin of the people. Early Society, Shintoism-The rule of the Shoguns. Political , Social and Economic conditions. The opening of Japan: Coming of The Europeans-Perry Expeditions. Treaties-Fall of Shogunate.

UNIT : II

The Meiji Restoration and Modernisation:

Meiji Restoration-Causes –Changes brought about by Meiji restoration –Progress in Industry and Agriculture. Socio, economic and Political structure . Impact of West: Religious reforms-Education- Intellectual Awakening-Cultural life.

UNIT : III

Beginning of Militarism and Imperialism :

Japan's Interest in Korea-Hostile attitude of U.S.A-Sino-Japanese war of 1894-95- Anglo – Japanese Alliance.Russo-Japanese war-Japan becomes an imperial nation-Stages in Territorial expansion-Korea ,Manchuria . American involvement in Manchria-Japan's relation with China . Japan and the first world war(1914-1919)- Japan's 21 demands. Japan and international conferences.

UNIT : 1V

Japan upto 1945

The Washington Conference of (1921-22) -Second Sino-Japanese war-Japan's relation with Germany, Russia and America . Rome- Berlin-Tokyo Axis-Japan and The second world war.

UNIT : V

Japan since 1945

Consequences of Japan's defeat- Economic rebuilding- Causes of economic success –
Industrial growth-Major industries, Transport-Trade and Economic cooperation-Labour
Movement- Welfare measures-Development of science and technology.

TEXT BOOKS:

M.D .David - Rise and Growth of Modern Japan , Himalaya Publishing House, Bombay

R.S.Chaurasia – History of Modern Japan. Forward Book Depot-Delhi

BOOKS FOR REFERENCES:

1. Beasley, W.G. – The Modern History of Japan, London, 1971
2. Chakravarthi N.R - Hundred Years of Japan and India, Calcutta 1978.
3. Majumdar R.K and Srivastva A.N - History of Japan
4. Shivkumar , S. Jain - History of Modern Japan.
5. Vinacke ,H.M -A History of the Far East in Modern Times, London 1967

MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI
PG - COURSES – AFFILIATED COLLEGES
Course Structure for M. Com.
(Choice Based Credit System)
(With effect from the academic year 2017-2018 onwards)

Sem.	Sub. No.	Subject status	Subject Title	Contact Hrs./ Week	Credits
(1)	(2)	(4)	(4)	(5)	(6)
I	1	Core-1	Management Accounting	6	4
	2	Core-2	Advanced Business Statistics	6	4
	3	Core-3	Management Concepts and Organizational Behaviour	6	4
	4	Core-4	Office Automation	6	4
	5	Core-5	Modern Marketing Management	6	4
II	6	Core-6	Financial Management	6	4
	7	Core-7	Quantitative Techniques for Decision Making	6	4
	8	Core-8	Legal Frame work of business	5	4
	9	Core-9	Business Environment	5	4
	10	Core-10	Retail Management	4	4
	11	Elective - 1	Entrepreneurship Development	4	3

MANAGEMENT ACCOUNTING

L	T	P	C
6	0	0	4

Objective:

The objective of the course is familiarising the management accounting practices used by management for effective administration.

Unit I

Introduction and Financial statement Analysis

Management Accounting: Definition, Scope, Objectives, Functions, Advantages and Limitations
- Management Accounting Vs. Financial Accounting - Management Accounting Vs. Cost Accounting - Tools of Management Accounting - Installation of Management Accounting system - Organisation for Management Accounting

Unit II

Funds Flow analysis and Cash Flow analysis

Funds Flow Analysis: Concept of fund - Procedure for preparation of Fund Flow Statement –
Cash Flow Analysis: Procedure for preparation of Cash Flow Statement as per AS3 –
Differences between Fund Flow Statement and Cash Flow Statement.

Unit III

Marginal Costing and Break Even Analysis

Marginal Costing - Important concepts – Marginal costing and Absorption costing – Break Even Analysis – Cost Volume Profit Analysis – Managerial Applications of Marginal costing.

Unit IV

Standard costing and Variance Analysis

Standard cost and Standard costing – Analysis of variances: Direct Material, Direct Labour, Overhead and Sales variances

Unit V

Budgetary Control

Budget – Budgeting – Budgetary Control - Functional budgets: Sales, production, production cost, purchases, purchase cost and cash budget – Fixed and Flexible Budget – Master budget - Zero Base Budgeting.

References

1. Management Accounting, S.N.Maheshwari, Sultan Chand & Sons, New Delhi.
2. Management Accounting, Dalston L Cecil and Jenitra L Merwin, LearnTech Press, Trichy.
3. Management Accounting, ShashiK.Gupta and R.K.Sharma, Kalyani Publishers, New Delhi.

ADVANCED BUSINESS STATISTICS

L	T	P	C
6	0	0	4

Objective:

The objective of the course is to acquaint students with important statistical techniques for managerial decision making .The emphasis will be on their applications to business and economic situations

Unit I

Probability Distribution: Theoretical Distribution - Binomial, Poisson, and Normal Distributions and their applications to business.

Unit II

Statistical Inference: Test of Hypotheses: – Standard error and sampling Distribution - procedure for testing of Hypothesis- Two tailed and one tailed Test of Hypothesis – Assumptions of the Parametric data- Z test-One sample T Test-Independent Sample T test– Paired sample T Test - Analysis of Variance (ANOVA)

Unit III

Non Parametric Tests: Chi-square tests-Sign tests-Kruskal-Wallis test- Mann Whitney U test.

Unit IV

Statistical Decision Theory: Decision making Environments – Criteria for making decision under condition of risk and uncertainty- Expected value approach.

Unit V

Statistical Quality Control: Control charts for variables and attributes-Acceptance sampling.

Books for Refeence:

- 1.Statistical methods - S.P.Gupta
- 2.Fundamentals of Statistics- Gupta, S.C.,
3. Levin, R.I. and D.S. Rubin, *Statistics for Management*, Prentice-Hall of India.
4. Spiegel, M.R. *Theory and Problems of Statistics*, Schaum Publishing Company.
5. Aczel, Amir D., *Complete Business Statistics*, McGraw Hill, 1999.
6. Kazmeir Leonard J., Norval F. Pohl, *Basic Statistics for Business and Economics*, McGraw Hill International (2nd ed.)

MANAGEMENT CONCEPTS AND ORGANISATIONAL BEHAVIOUR

L	T	P	C
6	0	0	4

Objective

The objective of this course is to help students understand the conceptual frame work of management and organizational behavior.

Unit-I

Management- Definition- Functions of manager- Management function – Planning, organizing, Authority responsibility, Powers of delegation, Decentralization, Staffing directing, Co-ordinating, Control- nature, process and techniques.

Unit-II

Organizational behaviour- evolution, Development, relationship between organization behavior and management, Attitudes, Perception, Learning, Personality, Transaction analysis Motivation- Meaning, concepts, Theories of motivation, Motivation and Morale

Unit III

Group dynamics- Definition, importance, Types of groups, Group formation and development, Composition, Performance, Leadership- Styles, theories.

Unit IV

Organizational change and development –Planned change- resistance to change and managing change. Organizational development (OD) meaning, objectives, models and OD interventionism

Unit-V

Quality of working life (QWL)- Evolution and development of constituents of Quality of work life QWL in Indian context International organizational behavior- cultural differences and similarities, individual behaviour in International organization- Group behaviour- Organisation characteristics- organization change and managerial career.

Books for Reference:

Principles of Management- L.M Prasad

Organizational Behavior- S.S.Khanka S.Chand& Company Ltd-2005

Organizational Behavior- Stephen P.Robbins- Pearson Education SinaporeP.Ltd.,

Reference books

Stephens P.Robbins- OrganisationalBehaviour, Prentice Hall 1997.

Organizational Behavior- Aswathappa- Himalaya Publishing House.

Organizational Behavior- John W.Navstrom and Keith Davis.Tata McGraw Hill.

Understanding Organizational Behavior- UdaiPareek- Oxford University Press

Organisational Behaviour Text and cases, Avinash.K.Chitale,et.al.,PHI Learning Private Limited

OFFICE AUTOMATION

L	T	P	C
6	0	0	4

Objective:

The objective of the course is to make the students to learn modern methods of office automation through computer

UNIT-I

MS-Word 10

Page formatting-working with columns-constructing high quality tables-working with complex documents-mail merge-publishing online forms.

UNIT-II

MS-Excel

Creating Excel worksheets-entering and editing cell entries, working with numbers, changing worksheet layout, other formatting options-printing in Excel-using functions and reference- naming ranges-creating charts- using custom and special effects-using financial and statistical functions.

UNIT-III

MS-Access

Objectives of Access Database-parts of Access window-starting Microsoft Access-creating a new database-creating a database through table wizard-creating table through Design window-Query-forms-Report.

UNIT-IV

MS-Power point

Creating power point presentation: creating a basic presentation-building presentation-modifying visual elements-formatting and checking text-adding objects-applying transitions-animation effects-preparing handout-taking the show on the road.

UNIT-V

Business Engineering and ERP

Business engineering-introduction-significance-principles-Enterprise Resource Planning (ERP)-introduction-evolution-integrated system approach-business benefits-ERP in business processes.

Text Books:

1. **Stephen L. Nelson**, "Office 2010,Computer Reference", Tata McGraw Hill Publishing company Ltd.
2. **Sumner Mary**- "Enterprise Resource Planning", Pearson Education, inc. I Edition 2012.

Reference Books:

1. **Gini Courter &AnnetelMaraquis**, "MS-Office 2010",BPB Publishing.
 2. **Alexis Leon**, "Enterprise Resource Planning", II Edition,Tata McGraw Hill Publishing company Ltd.2007.
 3. **GargVinodkumar, Venkitakrishnan.N.K.**, "Enterprise Resource Planning- Concept and Practice", II Edition, PHI Learning2009.
-

MODERN MARKETING MANAGEMENT

L	T	P	C
6	0	0	4

Objective:

The course intends to impart students with modern marketing management practices

UNIT I:

Introduction: Concept, nature, scope and importance of marketing; Marketing concept and its evolution; Marketing mix; Strategic marketing planning – an overview. Issue and Developments in marketing: Social, ethical and legal aspects of marketing; Marketing of Services; International marketing; Green marketing; Cyber marketing; MLM-Relationship marketing and other developments in marketing.

UNIT II:

Product Decisions: Concept of a product; Classification of products; major product decisions; product line and product mix; Branding; Packaging and labeling; Product life – cycle – strategic implications; New product development and consumer adoption process.

UNIT III:

Marketing Research – Marketing Environment – Marketing Information System – Difference between Marketing Research and Marketing Information System .Pricing Decisions: Factors affecting price determination; Pricing policies and strategies; Discounts and rebates.

UNIT IV:

Distribution Channels and Physical Distribution Decisions; Nature, functions, and types of distribution channels; Distribution channel intermediaries; Channel management decisions; Retailing and wholesaling.

UNIT V:

Promotion Decisions: communication process; Promotion mix – advertising, personal selling, sales promotion publicity and public relations; Determining advertising budget; Copy designing and its testing; Media selection; Advertising effectiveness; Sales Promotion – tools and techniques.

Reference :

1. Kotler, Philip: Marketing Management – Analysis, planning, implementation and control, Prentice Hall New Delhi.(latest edition).
2. Marketing: A Managerial Introduction: J.C. Gandhi, McGraw Hill Publications, latest edition.
3. Majumdar, Rananuj; Product Management in India, Prentice hall, New Delhi. \
4. MC Carthym E. jenone and William D perreaultJr;Basic Marketing; Managerial approach, Richard D.irwn, Homewood , Illiois. Reprint.
5. Ramaswamy, V.S and Namakumari,S; Marketing management, Macmillan India, New Delhi.
6. Srinivasan, R;Case studies in marketing; the Indian context, Prentice Hall, New Delhi.
7. Stanton, William J. and chariesfutrell; fundamentals of marketing; McGraw hill publishing co., New York.
8. Still.RichardR,EdwardW.Cundiff and Norman A.P Govoni Sales Management: Decisions, Strategies and cases, Prentice Hall, New Delhi.
9. Chandra Bose, Modern Marketing – Principles & Practice, Prentice Hall, New Delhi.
- 10.Chandrasekar,K.S,Marketing Management-Text Cases, Vijay Nicole Imprints Private Limited,Chennai

FINANCIAL MANAGEMENT

L	T	P	C
6	0	0	4

Objective:

The objective of the course is to make the students acquainted with modern principles of financial management.

UNIT- I

Financial Management – Meaning – Nature and scope of finance – Objectives – Profit Vs Wealth maximization – Finance functions – Functions and role of Finance Manager – Time value of money.

UNIT –II

Capital Budgeting – Investment decisions – NPV, IRR., ARR - Payback period – Profitability Index – NPV and IRR comparison- Capital rationing – Risk analysis – Time Value of money - Techniques.

UNIT –III

Cost of Capital – Significance, Importance and concepts – Cost of Debt – Preference capital – Equity capital – Retained earnings – Combined cost of capital (Weighted) - Cost of equity – CAPM.

UNIT – IV

Capital structure theories – Traditional and MM hypothesis – Determining capital structure in practice – Operating, financial and combined leverage – Measurement of Leverages – Effects of operating and financial leverage on profits – Significance of leverage.

UNIT-V

Working capital Management – Meaning – Significance – Types of working capital – Estimation of Working capital requirements – Management of cash – Dividend policies – Issues in dividend decisions – Walter model – Gordon’s model – M.M hypothesis forms of dividend.

Books for reference:

1. Khan MY, Jain Pk, Financial Management; Tata McGraw Hill, New Delhi
2. Chandra, Prasanna, Financial Management, Tata McGraw Hill, Delhi
3. Pandey, I.M., Financial Management, Vikas Publishing house, Delhi
4. Maheswari S.N. Financial Management: Principles and Practice, Sultan Chand and sons, New Delhi, 2013
5. Tulsian.PC, Bharat Tulsian, Financial Management, S. Chand New Delhi 2010
6. P.Periasamy, Financial Management, Vijaay Nicole Imprints Pvt. Ltd.,2015

QUANTITATIVE TECHNIQUES FOR DECISION MAKING

L	T	P	C
6	0	0	4

Objective:

The objective of the course is to acquaint the students with the use of quantitative models in decision making.

UNIT I

INTRODUCTION AND LINEAR PROGRAMMING:

Operations Research-Quantitative Approach to Decision Making - Nature and Significance of OR in Decision Making-Models in Operations Research- Application Areas of Operation Research- Linear Programming-General Concepts -Definitions - Assumptions in Linear Programming - Limitations in Linear Programming - Applications of Linear Programming - Formulation of LP Problems - Solution Methods : Graphical method (maximization and minimization)- Simplex method (maximization and minimization(Big M Method)).

UNIT II

TRANSPORTATION

Concepts- Formulation of Transportation Problem- Balanced and Unbalanced Problems- Minimization and Maximization Problems, Finding IBFS - Northwest Corner Rule(NWCR) , Least Cost Rule (LCR) and Vogel's Approximation Method(VAM) - Optimality Tests - Modified Distribution method (MODI).

UNIT III

ASSIGNMENT PROBLEMS

Concepts - Mathematical Formulation of an Assignment Problem - The Assignment Algorithm (Hungarian Assignment method) - Balanced and Unbalanced Assignment Problems- Minimization and Maximization Problems-Restricted and Reserved routes / choice - Travelling Salesman Problem as an Assignment Problem.

UNIT IV

PROJECT MANAGEMENT AND QUEUING MODELS

Introduction- Types of Networks - CPM : Critical Path Method and PERT: Programme Evaluation Review Technique – Basic differences between CPM and PERT - Drawing a network - Obtaining of Critical Path- Time estimates for activities.-Probability of completion of project- Determination of floats (total, free, independent)-Queuing Models- Introduction, Concepts, Terminology - General structure of queuing system - Operating Characteristics of Queuing system - Poisson-exponential single server model(finite population).

UNIT V

REPLACEMENT ANALYSIS AND SIMULATION

Replacement of capital assets – discrete cases when time value of money is not considered and when time value of money is considered.-Replacement of items that fail suddenly
-Monte-Carlo method of simulation.

Books for reference:

1. Operations Research - J.K. Sharma, Macmillan India Ltd.
2. Operations Research – V.K.Kapoor ,Sultan & Sons
3. Operational Research - An Introduction, Taha, H.A - Macmillan
4. Operations Research – Kanti Swarup, P.K. Gupta, Man Mohan, S. Chand
5. Operations Research-S.Gurusamy, Vijay Nicole Imprints Private Limited
6. Operations Research-R.Panneerselvam, Vijay Nicole Imprints Private Limited

LEGAL FRAME WORK OF BUSINESS

L	T	P	C
5	0	0	4

Objective:

To create the knowledge of Legal perspective and its practices to improve the business.

UNIT I

Payment of Wages Act – Payment of Bonus Act – Industrial Disputes Act, Sale of Goods Act 1930.

UNIT II

Provisions of Companies Act 2013 relating to Company Administration – Board of Directors – Manager – Managing Director – Provisions relating to various types of meetings and their related items – powers, duties and liabilities of Directors – Corporate Governance.

UNIT III

Foreign Exchange Management Regulation Act1999, Objective and definitions under FEMA – Dealings in foreign exchange – holding of foreign exchange etc. current account transactions, capital account transactions – export of goods and service realization and repatriation of foreign exchange – Exemptions authorized person – penalties and enforcement – Compounding of offences – Directorate of enforcement – Appellate Tribunal etc.

UNIT IV

Environmental Legislation Legal and regulatory frame work – procedures for obtaining various environment clearances – role and function of Environments of Environment Tribunal / Authority – Appearance before Environment Tribunal / Authority – Environment Audit.

UNIT V

Consumer Protection Act – Consumer rights, Procedures for Consumer grievances redressal, Types of consumer RedressalMachinaries and Forums – Competition Act 2002 – Cyber crimes, IT Act 2000 and 2002, Cyber Laws, Introduction of IPR – Copy rights, Trade Marks, Patent Act.

TEXT BOOKS

1. N.D. Kapoor, Elements of mercantile Law, Sultan Chand and Company, India, 2006.
2. P.K. Goel, Business Law for Managers, Biztantatara Publishers, India, 2008.
3. AkhileshwarPathack, Legal Aspects of Business, 4th Edition, Tata McGraw Hill, 2009.
4. Kapoor, N.D. “Elements of Mercantile laws”, Sultan Chand & Sons New Delhi, 1999
Maheshwari, S.N &Maheshwari, S.K “A Manual of Business Laws”, Himalaya Publishing House Bombay, 2003.

REFERENCES

1. P.P.S. Gogna, Mercantile Law, S.Chand& Co. Ltd., India, Fourth Edition, 2008.
2. Dr.Vinod, K.Singhania, Direct Taxes Planning and Management, 2008.
3. Richard Stim, Intellectual Property- Copy Rights, Trade Marks, and Patents, Cengage Learning, 2008.
4. Balanchandran V., Legal Aspects of Business, Tata McGraw Hill, 2012.
5. Daniel Albuquerque, Legal Aspect of Business, Oxford, 2012.
6. Ravinder Kumar – Legal Aspect of Business – Cengage Learning, 2nd Edition – 2011.
7. K.C. Mishra and M.Bakshi, legal and Regulatory Aspects of Insurance, CENGAGE learning, Delhi, 2005.
8. Kenneth A.Abraham, Kenneth S. Abraham Insurance laws Regulation : Cases and Material, Foundation Press, 2005.
9. Corporate Laws – Taxman Publication.

BUSINESS ENVIRONMENT

L	T	P	C
5	0	0	4

Objective:

The objective of the course is to make the students to understand the changing environment around the business.

Unit I

Business environment – Meaning – Types of environment – Internal and external environment. Environment analysis and forecasting – Techniques for environmental analysis – Approaches to environmental analysis – Types of forecasting – Techniques for environmental forecasting – Benefits of environmental analysis – Limitation of environmental forecasting.

Unit II

Business and society – Business ethics and values – Culture and business. Corporate governance – Need and importance of corporate governance – Principles of good corporate governance – Corporate transparency – Corporate accountability – Recommendations of Birla committee. Industrial policy – Industries (Development and Regulation Act) – Industrial Licensing.

Unit III

Public sector – growth and performance – the new public sector policy – Organisation of public enterprises – government control over public enterprises. Pricing policy of public enterprises – private sector – joint sector – co-operative sector. Privatisation and disinvestment – Arguments against privatisation – Rengarajan committee on disinvestment – Privatisation in India.

Unit IV

Globalisation of business – Stages of globalisation – Essential conditions of globalisation – Pros and cons of globalisation – WTO and India International investments – Types of foreign investments – Regulation of foreign investments – Foreign investments by Indian companies – Multinational corporations.

Unit V

Social responsibility of business – Social orientation of business – Responsibilities of business to different sections – Arguments for and against social movement – Social Audit.

Reference Books

1. Dr. C.B. Gupta, “Business Environment” Sultan Chand and Sons, New Delhi, 2011.
2. Francis Cherunilam, “Business Environment Text and cases” Himalaya Publishing House, Mumbai, 2011.
3. H.L.Ahuja, ‘Economic Environment of Business’, S.Chand, New Delhi, 2009.

RETAIL MANAGEMENT

L	T	P	C
4	0	0	4

Unit – I

Introduction: – Meaning – Concepts – Formats of Retailing – Functions – Importance – Retail trends in India.

Unit – II

Retail Merchandising: - Basics of Retail Merchandising – Process –Methods – Retail Merchandise Mix – Merchandise buying – Analysing – Merchandise Performance.

Unit – III

Retail location strategy: - Importance of location decisions – Retail Franchising – Types of Retail location and site locations – Determining Factors – Retail location theories – Strategic Retail Planning Process.

Unit – IV

Retail Market Segmentation: - Market segmentation – Benefits of market segmentation – Segmenting, targeting and positioning – Criteria for effective market segmentation – Dimensions of segmentation.

Unit – V

Retail store Operation: - Elements of Retail store – Operations – Management of Retail outlet – Role of centralized retailers – Operations master schedule (OMS) – Store Maintenance.

Reference Books

1. Dr.Harjit Singh, “Retail management” A Global Perspective Text and Cases , “Sultan Chand Publications.
- 2.”Chetan Bajaj”, Rajnish Tuli and Nidhi V Srivastva. “Retail Management” Oxford University Press.
3. Gibson.G.Vedamani, “Retail Management – Functional and Practices, “Jaico Publishing house.
4. Suja Nair, “Retail Management” – Himalaya Publishing house.
5. David Gilbert “Retail Marketing management- Pearson Education low price Edition, New Delhi 2008.

ENTREPRENEURSHIP DEVELOPMENT

L	T	P	C
4	0	0	3

Unit – I

Entrepreneur – Meaning - Types of Entrepreneurs – Characteristics – Factors affecting Entrepreneurial growth – Knowledge and skills of Entrepreneur’s – Functions of Entrepreneurs.

Unit – II

Entrepreneurial motivation – Need – Objective – Achievement of motivation training – Self Rating – Stress Management – Entrepreneurship development programme.

Unit – III

Micro, small and medium Enterprises – Definition – Characteristics – Objectives – Advantages and disadvantages – Importance – Problems of Micro, small and medium (MSM) enterprises – Steps involved in starting up a business.

Unit – IV

Finance and Accounting – Need – Source of Finance, Term loans – Capital structure – Financial Institutions – Taxation.

Unit – V

Women Entrepreneur – Concept – Reasons for the slow growth in India – Problems of women Entrepreneurs – Measures for the development of women Entrepreneurs in India – Sickness of small business – Concept - Consequence - Connective measures.

Reference Books

1. S.S.Kanka: Entrepreneurial Development, Sultan Chand.
2. C.B. Gupta & N.P.Sreenivasan : Entrepreneurial Development, Sultan Chand.
3. Prasanna Chandra: Project Planning, Analysis, Selection, Implementation and Review, Tata McGraw Hill.
4. Nirmal K. Gupta: Small industry – Challenges and Perspectives, Anmol Publications.
5. Vasantha Desai: Small Scale Industries and Entrepreneurship, Himalaya.

Table - 3: Common Course Structure for **P.G. Degree Programme in Science – M.Sc. (General)**[#](with effect from the academic year 2017-2018 onwards) M.Sc. BOTANY

Sem	Sub No.	Subject Status	Subject Title	Contact Hrs./ Week	Credits
(1)	(2)	(3)	(4)	(5)	(6)
I	1	Core-1	Algology and Bryology.	6	4
	2	Core-2	Mycology, Lichenology and Molecular Pathology.	6	4
	3	Core-3	Microbiology and Immunology.	5	4
	4	Core-4	Phytochemistry.	5	4
	5	Core-5 Practical - 1	Algology, Bryology, Mycology and Lichenology.	4	2
	6	Core-6 Practical - 2	Molecular Pathology Microbiology, Immunology and Phytochemistry.	4	2
	Subtotal				30
II	7	Core-7	Pteridophytes, Gymnosperms and Paleobotany	5	4
	8	Core-8	Genetics, Cell & Molecular Biology	5	4
	9	Core-9	Anatomy. Embryology and Morphogenesis	4	4
	10	Core-10	Entrepreneurship Botany	4	4
	11	Core - 11	Field Work	4+	3
	12	Core-12 Practical - 3	Pteridophytes, Gymnosperms, Paleobotany and Anatomy.	4	2
	13	Core-13 Practical - 4	Genetics, Cell & Molecular Biology, Embryology, Morphogenesis and Entrepreneurship Botany.	4	2
Subtotal				30	23

Sem.	Sub. No.	Subject Status	Subject Title	Contact Hrs./ Week	Credits
(1)	(2)	(3)	(4)	(5)	(6)
III	14	Core-14	Taxonomy of Angiosperms and Economic Botany	6	4
	15	Core-15	Biochemistry and Biophysics	6	4
	16	Core-16	Computer Application and Bioinformatics	5	4
	17	Core-17	Research Methodology	5	4
	18	Core-18	Taxonomy of Angiosperms, Economic Botany and Research Methodology Practical - 5	4	2
	19	Core-19	Biochemistry, Biophysics, Computer Application and Bioinformatics Practical - 6	4	2
	Subtotal				30
IV	20	Core-20	Plant Physiology	4	4
	21	Core-21	Plant Ecology and Conservation Biology	4	4
	22	Core-22	Applied Biotechnology	4	4
	23	Core-23	Plant Physiology and Applied Biotechnology Practical - 7	4	2
	24	Core-24	Plant Ecology and Conservation Biology Practical - 8	4	2
	25	Elective - 1	ELECTIVE – Medicinal Botany and Dietetics	3+	3
	26	Core-25	Project	7+	8
	Subtotal				30
Total				120	90

+ Extra hours for the Project

For the Project, flexible credits are b/w 5 – 8 & Hours per week are b/w 10 - 16.

Total number of credits \geq 90 : 90

Total number of Core Courses : 25 (15 T + 8 P + 1 Prj. + 1 FW.)

Total number of Elective Courses / F.W. / S.T. : 1

Total hours : 120

CORE PAPER 1

PLANT DIVERSITY I - ALGOLOGY AND BRYOPHYTES

UNIT - I

General characters and interrelationships of Algae with other thallophytes. Classification of algae (Fritsch, 1935). A comparative study of the major groups – with special reference to their occurrence, thallus structure and life-history of: Chlorophyceae, Charophyceae, Bacillariophyceae, Phaeophyceae and Rhodophyceae and Cyanophyceae.

UNIT- II

Comparative account of pigments, cell wall components, reserve food, flagella, chromatophores, pyrenoids, eyespot and nucleus. Range of thalli diversity- Life-cycle patterns and alternation of generations.

UNIT- III

Economic importance of algae with special reference to food, industrial products and medicine. Role of algae in soil fertility. Algal blooms and Fossil algae.

UNIT - IV

General characters of Bryophytes and interrelationships. Classification of Bryophytes by Rothmaler (1951). General characters of major orders – Marchantiales, Jungermanniales, Anthocerotales, Sphagnales, Funariales and Polytrichales.

UNIT - V

Life cycle pattern and alternation of generations in Bryophytes. Origin of Bryophytes – Reproduction in Bryophytes. Fossil bryophytes with special reference to *Naiadita*. Ecological adaptations and economic importance of Bryophytes.

Practicals

Algae

Caulerpa, Ulva, Chara / Nitella, Padina, Dictyota, Turbinaria, Gracillaria, Oscillatoria and *Scytonema, and Anabaena*.

Bryophytes

Riccia, Plagiochasma, Anthoceros, Funaria

Record

To maintain a record note book for evaluation.

Field Trip

Algal collection trip and submission of 5 Herbarium Sheets.

Reference Books

1. The Algae-Chapman, V.J. & Chapman, D.J. Elbs and Macmillian, London, 1960.
2. Structure and Reproduction of the Algae. Vol. I & II., Fritsh, F.E. Camb. Univ. Press, 1965.
3. The Biology of the Algae., Round, F.W. Edward Arnold Publishers, London, 1973.
4. Text Book of Algae., Sharma, O.P. Tata McGraw Hill Publishing Co., New Delhi, 1986.
5. Introductory Phycology., Kumar, H.D. Affiliated East Press, NewDelhi.
6. The Algae – A review – Prescott, G.W. Bishen Singh & Mahendra Pal Singh, Dehra Dun and Otto Koelta Science Publishers, West Germany, 1969.
7. Text book of Algae – Sharma, O.P. Tata McGraw Hill Publishing Co., New Delhi, 1986.
8. Text Book of Botany, Algae (Revised edition), Pandey B.P., S. Chand & Co., New Delhi, 2000.
9. Text Book of Algae, Sharma, O.P., Tata McGraw Hill Publ. Co.Ltd., New Delhi, 1992.
10. Introduction to Phycology, South, G.R. & Whittick, A. Blackwell Scientific Publ, Oxford.
11. Botany for Degree students, Algae 9th revised edition, Vashista Sinha B.R., Singh, V.P., 2002, S. Chand & Co. Ltd., New Delhi.
12. . British Mosses and Liverworts – Watson, E.V. Cambridge, 1980.
13. Biology of Bryophytes-Chopra, R.N. and Kumar, P.K.Wiley Eastern Ltd., New Delhi, 1988.
14. Bryophytes – Prem Puri. Atma Ram & Sons, Delhi, 1981.
15. An introduction to Embryophyta Vol. II, Parihar, N.S., Central Book depot, Allahabad, 1967.
16. The Interrelationships of t
17. he Bryophyta – Cavers, F. Indian report S.N. Technico (Book House), Patna, 1981.

CORE PAPER 2

PLANT DIVERSITY – II MYCOLOGY, LICHENOLOGY AND MOLECULAR PLANT PATHOLOGY

UNIT - I

Classification of fungi proposed by Alexopoulos and Mims (1979). Morphology, structure, reproduction, and life history. General characters of fungi of the following: Mastigomycotina - Zygomycotina - Ascomycotina - Basidiomycotina and Deuteromycotina.

UNIT - II

Mode of nutrition - Reproduction and life cycle patterns. Homothallism and Heterothallism in fungi. Homokaryon and Heterokaryon. Parasexuality and heterokaryosis. Economic importance of fungi - food, medicine and biocontrol agents. Mycorrhizae - Structure and Symbiotic association. Types - Ectotrophic - endotrophic - application of mycorrhizae in agriculture.

UNIT - III

General account of Lichens. Classification of lichens by Miller (1984). Structure, nutrition and reproduction of the three major groups. Economic importance. Lichens as pollution indicators. Microchemical tests for lichens.

UNIT - IV

Concept of plant diseases - causes of plant diseases - role of environment and host nutrition, enzymes, toxins and growth regulators on pathogenesis. Symptoms and identification. Host-parasite interactions. Disease control methods - Cultural, Physical, Chemical and Biological methods.

Defense strategies - Morphological and Biochemical. Molecular basis of gene-for-gene hypothesis: R-gene expression and transcription profiling, cloning of resistance genes and marker-aided selection, pyramiding of R genes.

UNIT - V

Common plant diseases: Diseases of Cereal crops - wheat and rice; Pulse Crops - mung bean and pigeon pea; Oilseed crops - sunflower and groundnut and Cash crops like cotton and sugarcane.

Practicals

Fungi

Mucor / Pilobolus, Agaricus, Xylaria, Polyporus, Puccinia.

Lichens

Micropreparations of vegetative and reproductive parts of any foliose / fruticose lichens.

Mycorrhizae

Permanent microslides / photographs.

Molecular plant pathology

Etiology of diseases on wheat / rice, groundnut, sugarcane.

Any photographs / slides / phytochemicals relevant to molecular pathology (host - pathogen interactions).

To maintain a record note book for evaluation.

Reference Books

1. Introduction to Fungi. Webster, J. Cambridge University Press London, 1970.
2. Fungi., Srivastava, S., Pradeep Publications, Jalandhar, 1999.
3. The Biology of Lichens., Hale, M.E., Edward Arnold, Mayland. 1983.
4. Botany for Degree Students – Fungi, Vashista, B.R., S.C hand & Co., New Delhi, 1982.
5. College Botany Vol. I Fungi & Pathology, Pandey B.P., 1997.
6. A Text book of Plant Pathology, Bilgrami, K.S. & Dube, H.C., Vikas, New Delhi.
7. Plant diseases. Singh, R.S., Oxford & IBH, New Delhi.
8. A textbook of Fungi, Bacteria and Virus.1978. Dube, H., Vikas Publ.,
9. Mills Dallice *et al.*, 1996. Molecular Aspects of Pathogenicity and Resistance: Requirement for Signal Transduction. APS, St Paul, Minnesota.
10. Parker, J. 2008. Molecular Aspects of plant Diseases Resistance. Blackwell Publ.
11. Gnanamanickam, SS (Eds). 2002. Biological Control of Crop Diseases. CRC Press, Florida.

CORE PAPER 3

MICROBIOLOGY AND IMMUNOLOGY

UNIT - I

Bacteriology: General characteristics - Classification (Bergey's), Ultra structure of bacterial cell : Gram positive & Gram negative, Endospore, Staining methods-, Reproduction - Fission and sporulation. Isolation and cultivation of bacteria, Nutritional types. Bacterial growth- continuous & synchronous culture. Kinetics of growth. Determination of bacterial growth – Direct method: Haemocytometer - Viable plate count - Indirect method: Turbidity.

UNIT - II

Mycoplasma and Virology: Mycoplasma - structure and classification. Viruses - General characters, Classification, Structure, Multiplication. Viruses of Eukaryotes - Plant viruses. Viroids and prions. Bacteriophages- classification, - Lytic and lysogenic cycle

UNIT III

Food and Industrial Microbiology: The role of microorganisms in foods - Spoilage of fruits, vegetables, meats, poultry, eggs, bakery products, dairy products and canned foods - Food preservation - Introduction to industrial microbiology-- Microbiology of fermented milk products (Cheese, Yoghurt), beverages, wine and vinegar industry. Production of 1) organic acid- Acetic acid; 2) Enzyme- Amylase.

UNIT - IV

Environment and Agricultural Microbiology: Microorganisms in soil environments: Surface, subsurface and deep soil conditions. Microorganisms in various aquatic environments: Freshwater, Brackish-water, Marine - Microbes in the extreme environments and their adaptations. Indicator organisms. Microbial inoculants in agriculture: *Rhizobium*, *Pseudomonas*, BGA, - Microbial Herbicides- Bt toxins.

UNIT- V

Immunology: Cells of the Immune System - Innate and Adaptive immunity - Antigens - Antigenicity and immunogenicity - B and T cell epitopes - Immunoglobulin: Structure, Function and Immunoglobulin classes. Antigen-Antibody reaction - Immune response during bacterial (Tuberculosis), parasitic (Malaria) and viral (HIV) infections, congenital and acquired immune-deficiencies.

Practicals

1. Preparation of culture media agar slant - agar plate.
2. Isolation of microbes by streak and pour plate method.
3. Isolation of soil microbes by serial dilution techniques.
4. Isolation and identification of Bacteria and Fungi from spoiled food.
5. Isolation of microbes from soil and water.
6. Gram staining of Bacteria.
7. Demonstration of bacterial mobility (Hanging drop method).

Reference books

1. Pelczar J.M., Chan E.C.S. and Kreig. R.N. 2008. Microbiology. 13th Reprint, Tata Mc Graw Hill Publishing Company Ltd, New Delhi.
2. G. Tortora, B. Funke and C. Case. 1995. Microbiology: An Introduction. 5th ed. Menlo Park, CA: Benjamin/Cummings.
3. J. Ingraham and C. Ingraham. 1995. Introduction to Microbiology. Belmont, CA: Wadsworth.
4. Mathews, R.E.F., 1957. Plant Virology. Cambridge University Press. London.
5. Atlas, R.M. 2000. Microbiology - Principles of Microbiology. Mosby Year Book Inc, Missouri.
6. Black, J. 2007. Microbiology - Principles and Explorations. 7th Edition, Prentice Hall International, Inc, New York.
7. Brock, T.D. 2000. Biology of Microorganisms. 9th edition, Southern Illinois University, Carbondale.
8. Prescott, L.M., Harley, J.P. and Klein, D.A. 1996. Microbiology. 3rd Edition, W.M.C. Brown Publishers, Chicago.
9. Salle, A.J. 1997. Fundamental Principles of Bacteriology. 7th Edition, Tata Mc Graw Hill Publishing Company Ltd, New Delhi.
10. Vijaya Ramesh, K. Food Microbiology, MJP, Chennai Immunology.
11. Kannan, T. Immunology, MJP, Chennai.
12. Mark Wheelis, 2010. Principles of Modern Microbiology, Jones and Bartlett, Cannada.
13. Richard, A., Godsby, Thomas, J., Kundf. Barbare A and Osborne, 2000. Kuby - Immunology W.H. Freeman and Company.
14. Rao C.V. A Text Book of Immunology, 2011. Narosa Publication House, New Delhi.

CORE PAPER 4
PHYTOCHEMISTRY

UNIT- I

Phytochemistry - Scope of Phytochemistry. Importance in pharmaceuticals industry. Preparation of plant extracts - maceration, infusion, digestion, decoction, percolation, sonication, hot continuous extraction, aqueous alcoholic extraction, superficial fluid extraction and counter-current extraction. Parameters for selecting appropriate extraction method.

UNIT - II

Secondary metabolites - definition, classification, preliminary phytochemical screening by chemical test. Methods for separation and isolation of constituents. Synergy and polyvalent action of phytomedicines.

UNIT- III

Flavonoids: Definition, properties, classification, natural sources and therapeutic applications of flavonoids: Flavones, Flavanones, Flavonols, anthocyanins. Alkaloids- Ephedrine, Serpentine and Morphine. Carotenoids- α and β -carotenes

UNIT - IV

Glycosides: Definition, properties, classification, natural sources, pharmacological and toxicological effects of glycosides. Terpenoids- β -Sitosterol, Glycyrrhizin. Phenolics - Coumarins and Tannins.

UNIT - V

Volatile oils - source, constituents, properties, extraction and utilization of Sandal wood oil, Lemon grass oil, Vetiver oil, Clove oil and Eucalyptus oil. Medicinal uses of resins.

Reference Books

1. Gurdeep Chatwal, 1983. *Organic Chemistry of Natural Products*, Himalaya Publishing House, Mumbai.
2. Jean Bruneton, 1999. *Pharmacognosy*, Second Edition, Lavoisier Publishers, Inc. USA.
3. Kokate, C.K., Purohit, A. P and Gokhale, S.R. 2004. *Pharmacognosy*, Nirali Prakashan Publications, Pune.
4. Nitin Suri, 2010. *Phytochemical Techniques*, Oxford Book Company.

5. Roseline, A. 2011. *Pharmacognosy*, MJP Publishers, Chennai.
6. Runit M Shah and Rupesh T Nayak, 2012. *Pharmacognosy*, Global Academic Publishers, New Delhi. (Part I and Part II).
7. Wallis, T.E. 1985. *Text Book of Pharmacognosy*, CSB Publishers, New Delhi.
8. William Charles Evans, 2002. *Pharmacognosy*, Fifteenth edition, Harcourt Brace & Company, Asia Pvt. Ltd.

Practicals

1. Quantification of Antioxidants in the given samples:

A. Estimation of flavonoids, B. Estimation of Ascorbic acid, C. Estimation of β -Carotene

2. Preliminary Phytochemical Test:

A. Alkaloids, B. Tannins, C. Phenols, D. Glycosides and E. Saponins

3. Spotters- Photographs/images of oil extraction, structure of: Ephedrine, coumarins, β -Sitosterol, Glycyrrhizin

II SEMESTER

CORE PAPER 7

PLANT DIVERSITY – III. PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY

UNIT - I

General features and origin of Pteridophytes. Classification of Pteridophytes (Reimer, 1954).

Range of morphology, structure, reproduction and evolution of gametophytes and sporophytes of the following: *Rhynia*, *Lepidodendron*, *Sphenophyllum*, *Calamites*.

UNIT-II

Range of morphology, structure, reproduction and evolution of gametophytes and sporophytes of the following: *Angiopteris*, *Lygodium*, *Isoetes*, *Equisetum*, *Ophioglossum*, *Pteris*, *Polypodium*, *Salvinia*, *Marselia* and *Azolla*.

UNIT - III

Stelar evolution in Pteridophytes. Heterospory and origin of seed habit. Structure, development and evolution of sori and Telome theory. Economic importance of Pteridophytes.

UNIT - IV

A general account of the characteristic features of Gymnosperms. Origin of Gymnosperms. Classification of Gymnosperms (Sporne, 1965). General account of *Williamsonia*.

General account on the distribution, morphology, anatomy, reproduction and phylogeny of *Cycas*, *Araucaria*, *Ginkgo*, *Taxus*, *Ephedra*, *Gnetum*. Economic importance of Gymnosperms.

UNIT - V

Concepts of Palaeobotany, A general account on Geological Time Scale. Techniques for palaeobotanical study. Fossil types: Compressions, incrustation, casts, molds, petrifications, coalballs and compactions.. Systematic and Nomenclature of fossil plants. Palaeoclimates and fossil plants. Role of fossil in oil exploration and coal excavation.

Practicals

Pteridophytes

Selaginella, *Isoetes*, *Pteris*, *Adiantum*, *Salvinia* and *Azolla*.

Fossil slides: *Rhynia*, *Lepidodendron*, *Sphenophyllum*, *Calamites*.

Gymnosperms

Cycas, *Araucaria*, *Ginkgo*, *Taxus*, *Ephedra*.

Fossil slides: *Lyginopteris*, *Heterangium*, *Cordaites* and *Medullosa*.

Preparation of double stained permanent slides each one from Pteridophytes and Gymnosperms

Reference Books

1. Parihar, N. S. 1985. The Biology and Morphology of Pteridophytes. Central Book Depot, Allahabad.
2. Rashid, A. 1986. An Introduction to Pteridophyta. Vani Educational Books, New Delhi.
3. Sharma, O. P. 1990. Text Book of Pteridophyta. Macmillan India Ltd., India.
4. Smith, G. M. 1971. Cryptogamic Botany. Vol. II. Bryophytes and Pteridophytes. Tata McGraw Hill, New Delhi.
5. Sporne, K.R. 1972. The Morphology of Pteridophytes. B.I. Publications, Madras.
7. Sundararajan, S. 2007. Introduction to Pteridophyta. New Age International Publishers, New Delhi.
8. Vashishta, P. C. *et al.*, 2008. Botany for Degree Students: Pteridophyta. S. Chand and Co. Ltd., New Delhi.
9. Chamberlain, C.J. 1957. Gymnosperms Structure and Evolution. University Chicago Press, New York.
10. Sporne, K.R. 1974. The Morphology of Gymnosperms. B.I. Publications, New Delhi.
11. Vasishta, P.C. *et al.*, 2006 Botany for Degree Students: Gymnosperms. S. Chand and Co. Ltd., New Delhi.
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13. Nikias, K.J. 1981 Palaeobotany, Palaeoecology and Evolution. Praeger Publishers, USA.
14. Seward, A.C. 1919. Fossil Plants. Vol. I, II, III and IV. Cambridge University Press, London.

CORE PAPER 8

GENETICS, CELL AND MOLECULAR BIOLOGY

UNIT - I

Structure and functions of nucleus, nuclear envelope and nucleolus. Chromosomes. Cell cycle, Cell divisions: Mitosis-mitotic apparatus and its physiochemical characteristics and biochemical composition. Meiosis.

Sex determination in plants - theories of sex determination. Sex linked characters- primary, secondary and permanent. Sex- influenced and sex limited characters. Molecular basis of mutation- physical and chemical mutagens and their mode of action. Gene mutation.

UNIT - II

DNA- types (A, B, C & Z), Watson and Crick model of DNA, viral DNA, bacterial DNA, Mitochondrial and Chloroplast DNA. Dissociation and re-association kinetics of DNA, cot value, rot value and its significance. DNA synthesis and replication (prokaryote and eukaryote)-Enzymes involved, origin of replication, priming, DNA polymerases. Methylation of DNA.

UNIT - III

Damage and DNA repair mechanism - photo reactivation - excision repair - mismatch repair. Genetic recombination- generalised - site specific. Molecular mechanism- Holliday model. Lysogenic and lytic cycle - Bacterial Transformation - Transduction and Conjugation.

UNIT - IV

RNA-synthesis- types. RNA polymerases-role. Transcription-(Prokaryote, Eukaryotes), Initiation, elongation, termination, post transcriptional changes in RNA. Genetic code, Wobble hypothesis. Translation - ribosome assembly, formation of initiation complex, initiation factors, elongation and termination, translational inhibitors.

UNIT - V

One gene one enzyme hypothesis. Modern concept of genes. Fine structure of the gene - pseudoalleles. IS Element-transposons. Operon concept, *trp* operon, *gal* operon. Positive and negative control - Catabolite Repression, Gene Regulation in Eukaryotes. Gene silencing.

Practicals

Solving problems involving:

1. Simple Molecular biology problems based on the theory syllabus.
2. Interactions of genes.
3. Chromosome mapping from test cross data.
6. Sex determination, Sex linked inheritance.
7. Identification of different stages of meiosis from suitable plant material.
8. Interpretation of micrographs.
9. Study of mitotic index from suitable plant material

Molecular Biology (demo)

1. Isolation of plant genomic DNA and its quantification by UV- spectrophotometric method.
2. Isolation of RNA and its quantification by UV - spectrophotometric method.

Spotters

Cot curve, DNA melting curve, Karyotype and idiographic analysis.

Reference Books

1. Benjamin Lewin, 2004. Genes VIII. Pearson Prentice Hall.
2. Channarayappa, 2006. Molecular Biology. Principles and Practices. Universities Press (India), Pvt. Ltd., Hyderabad.
3. David Freifelder, 2006. Molecular Biology. Narosa Publishing House, Madras, New Delhi.
4. Gupta, R.K. 2006. Genetics. Rastogi Publications.
5. Nicholl, DST, 2001. An Introduction to Genetic Engineering. Cambridge University Press.
6. Old, R.N. and Primrose, S.B. 2004. Principle of Gene Manipulation. Blackwell Scientific Publication, USA.
7. Power, C.B. 2007. Genetics Vols I & II. Himalaya Publishing House. Kundanlal Chandak. Industrial Estate. Ghat Road. Nagpur.
8. Satyanarayana, U. 2006. Biotechnology. Books and Allied (p). Ltd. Kolkatha.
9. Russel, P.J. 2010. iGenetics. Benjamin Cummings, Sanfransisco Boston NewYork.
10. Turner, P., A. McLennan, A. Bates, M.White, 2005. Instant notes Molecular Biology, Third Edition, Taylor & Francis.
11. Avinash Upadhyay and Kakoli Upadhyay, 2005. Fundamentals of Molecular Biology. First edition, Himalaya Publishing House.

CORE PAPER 9
ANATOMY, EMBRYOLOGY AND MORPHOGENESIS

UNIT - I

Meristem - Classification of meristems - apical meristem. Organization of shoot apical meristem (SAM) and root apical meristem (RAM). Cell to cell communication. Programmed Cell Death (PCD) - Vascular cambium - origin, structure, seasonal activity.

UNIT - II

Xylem, Phloem and their elements - primary and secondary structures. Secondary growth - periderm - structure development of lenticels. Anomalous secondary growth.

UNIT - III

Wood anatomy - physical, chemical and mechanical properties. Defects in wood - natural defects, knots and defects due to diseases. Reaction wood - Tension and Compression wood - Durability of wood. Ontogeny of dicot and monocot leaves. Kranz anatomy. Development of stomata, trichome development and Dendrochronology.

UNIT - IV

Microsporogenesis - Pollen wall, Pollen development Pollen storage, Pollen allergy, Megaspores. Fertilization - barriers of fertilization. Endosperm - Types and haustoria. Organogenesis of dicot and monocot embryo. Apomixis and Polyembryony.

UNIT - V

Plant Morphogenesis - Definition – Polarity - as expressed in external and internal structures and in isolated cells. Symmetry - types. Differentiation as expressed in structure - effect of environment on differentiation - Factors controlling morphogenesis.

Practicals

Anomalous activity of cambium in *Boerhaavia*, *Bougainvillea*, *Achyranthes* and *Dracaena*.

Wood anatomy –any 4 common timbers (T.S, T.L.S and R.L.S)

Leaf anatomy - C₃ (rice) & C₄ – (*Cynodon*, *Zea mays*).

Dissection of globular / Cordate stage of embryos and endosperm haustorium from suitable seed.

Reference Books

1. Brown *et al.*, 1981. Text book of wood Technology Mc Graw Hill.

2. Clowers, F.A.L. 1961. Apical Meristems. Blackwell scientific Publication, oxford.
3. Cutter, E.G. 1978. Plant Anatomy, Edward Arnold Publishers Ltd; London.
4. Easu, K. 1953. Plant Anatomy. John Wiley & sons Inc; New York.
5. Fahn, A. 1989. Plant Anatomy. Maxwell Pvt. Ltd., Singapore.
6. Metcalfe and Chalk. 1950. Anatomy of the Dicotyledons and Monocotyledons. Vol. I and II. Clarendon Press, oxford, U.K.
7. Singh, V., Pande, P.C and Jain, D.K. 1987. Anatomy of seed plants. Rastogi Publications, Meerut.
8. Agarwal, S.B. 1990. Embryology of Angiosperms - a fundamental approach. Sahitya Bhawan, Agra.
9. Bhojwani S.S and Bhatnagar, S.P. 1981. Embryology of Angiosperms. Vikas Publishing House Pvt. Ltd., New Delhi.
10. Dwivedi, J.N. 1998. Embryology of Angiosperms. Rastogi Publications, Meerut.
11. Maheswari, P. 1965. An Introduction to Embryology of Angiosperms. International Society of Plant Morphologies, University of Delhi.
12. Bard, J. 1990. Morphogenesis. Cambridge University Press, London.
13. Bonner. J.T. 1965. Morphogenesis. Oxford & IBH Publications, Bombay.
14. Bryant, J.A and Francis, D. 1985. The Cell Division cycle in plants. Cambridge University Press, London.

CORE PAPER 10
ENTREPRENEURSHIP BOTANY

UNIT - I

Gardening: History, scope and importance of gardening - Types of Gardening: Water garden (Aqua Garden), Desert and Rock Garden (Xeric Garden), Kitchen Garden, Landscape Garden. Cultivation: Topiary, Bonsai, Nursery practices, Management and Marketing of garden plants.

UNIT - II

Olericulture and Floriculture: Major Vegetables of Tamilnadu- Onion & Brinjal. **Floriculture:** Aromatic flowers. Indoor cultivation of Flowers. Green, Poly and Glass Houses. Outdoor cultivation of Flowering Plants - *Rosa*, *Chrysanthemum*, and *Jasmine* Flower arrangement, cut flowers, Bouquet Making. Industrial uses of Flowers - Dyes preparation from flowers. Marketing Avenues.

UNIT - III

Organic Farming: Historical Account of Organic Farming - Impact of organic farming in the current scenario. Bio Composting - *Azolla* Cultivation. Vermicomposting - methods - Vermi Marketing.

UNIT - IV

Mushroom Cultivation: Brief History - Scope of Mushroom Cultivation of Paddy straw and Oyster mushroom - Medicinal and Nutritional value of mushrooms. Pathology of Mushrooms. Harvesting and Post harvesting technology - Marketing, Packing, Storage and recipes.

UNIT - V

Entrepreneurship - funding agencies (NABARD), Rural Banking, FAO, TNAU, - STEP (Science & Technology Entrepreneurship Programme) - Govt and NGO's, Yojana Schemes. Entrepreneurship Development Programme (EDP). Need and their significance.

Reference Books

1. Don Ellison, 2002. Garden Plants of the world. New Holland Publishers. V.K.
2. Valerie Bradley, 2006. The complete guide to House Plants. Readers Digest, New York.
3. Geoff Hamilton, 1993. Gardens of World - Practical Gardening Course, BCA London.

4. Reader's Digest Guide to Creative Gardening 1984, London.
5. Collin Levis 1997. Bonsai - A Care Manual. Chancellor Press London.
6. Anna Pavord, 1996. The New Kitchen Garden. Dorling Kindersley London.
7. Peter Mc Hoy., Barbara Segall and Stephanie Donaldson. 1997. Practical Small Gardening.
8. Pratibha Trivedi. 1996. Home Gardening ICAR, New Delhi.
9. Jane Fearnley 1995. Gardening Made Fast, Wedenfeld London.
10. Vijaya Ramesh, K. 2007. Food Microbiology, MJP Publisher, Chennai.
11. Suresh Gopalani, 2011. Fundamentals of Applied Nutrition.
12. Sumathi R. Mudambi, Shalini Roa, M.V. Raja Gopal, 2006. Food Science New Age International (P) Ltd., New Delhi.
13. Mridula Mirajkar and Sreelata Menon Food Science and Processing Technology (Vol. I &II) Kanishka Publishers, New Delhi.
14. Dhinesh kumar, 2009. Food Service and Catering Management Omega Publishers, New Delhi.
15. N.K. Jain 2011. Fundamentals of Food Science Technology Processing and Preservation. Cyber Tech Publications.
16. Ramani, A.V. 2009. Food Chemistry MJP Publishers, Chennai.
17. Hard, H.E. 2013. The Mushroom, MJP Publishers, Chennai.
18. Mukund Joshi, 2012. New Vistas of Organic Farming. Scientific Publishers Bangalore.
19. Singh, J.K. 2012. Mushroom Disease and its control. Emkay Publishing House, New Delhi.
20. Dey, S.C. 2000. Mushroom Growing, Agrobios, Jodhpur.
21. Singh, 2005. Modern Mushroom cultivation. International Book Distributors Deharadun.
22. Suman 2005. Mushroom Cultivation Processing and Uses. IBH Publishers and Distributors, New Delhi.
23. Pathal, V.K.N. Yadav and Gaur, M. 2000. Mushroom Production and Processing Technology.
24. TNAU, Hand Book on Mushroom Cultivation.

25. Sharma, V.P. 2006. Disease and Pests of Mushrooms, IBH Publishers and Distributors, New Delhi.
26. Geeta Sumbali, 2010. The Fungi, Narosa Publishing House, Chennai.
27. Patel A.V. and Singh R.P. 1968. Teaching Agriculture in India Ram Prasad and Sons, Agra.
28. Rais AHMAD, 2009. WTO and Indian Agriculture - Opportunities and Challenges (1-3 Vols) Mittal Publications, New Delhi.
29. Joshi, S.R. 2006. Biopesticides - A Bio Technological Approach New Age International (P) Ltd. N.D.
30. Subba Rao, N.S. 1988. Bio Fertilizer in Agriculture, Oxford & IBH, New Delhi.
31. C.S.I.R. 1988 - The Wealth of India (Service Pub & Inf. Directorate), New Delhi.
32. ICAR, 1987. Hand Book of Agriculture, New Delhi.
33. Sharma J.S. Principles and Practice of Plant Breeding.
34. Bailey, L.H. 1958. The Standard Cyclopedia of Horticulture, Macmillan London.

Note :

1. Students may be encouraged to visit TNAU / ICAR Research Stations.
2. Visiting websites.
3. Referring News Letter / Booklets of CSIR, TNAU, DBT.
4. Recommended Readings:- Velan Ulagam / Naveena Velanmai, Pasumai Vikadan, Tholil Nutpu, Thottakkalai, Herbal Bio Tech., and Hindu Survey of Agriculture.

Practical:(spotters)

- 1.Kitchen garden/water garden/Rockery**
- 2.Green house/Polyhouse/Glass house**
- 3.Organic farming-Azolla cultivation/Vermicompost**
- 4.Mushroom cultivation- Paddy straw/Oyster mushroom**
- 5.Note on Funding agencies - EDP/NABARD**

MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI
PG - COURSES – AFFILIATED COLLEGES
Course Structure for M.Sc. Chemistry
(Choice Based Credit System)
(with effect from the academic year 2017- 2018 onwards)

Sem (1)	Sub. No. (2)	Subject Status (3)	Subject Title (4)	Contact Hrs/ week (5)	Credits (6)
I	1	Core - 1	Organic Chemistry – I	4	4
	2	Core - 2	Inorganic Chemistry – I	5	4
	3	Core - 3	Physical Chemistry – I	5	4
	4	Elective - 1	Advanced Topics In Chemistry – I	4	4
	5	Core - 4 Practical - 1	Organic Chemistry Practical – I	4	2
	6	Core - 5 Practical - 2	Inorganic Chemistry Practical – I	4	2
	7	Core - 6 Practical - 3	Physical Chemistry Practical – I	4	2
	Subtotal				30
II	8	Core - 7	Organic Chemistry – II	5	4
	9	Core - 8	Inorganic Chemistry – II	4	4
	10	Core - 9	Physical Chemistry – II	5	4
	11	Elective - 2	Advanced Topics In Chemistry – II	4	4
	12	Core - 10 Practical - 1	Organic Chemistry Practical – II	4	2
	13	Core - 11 Practical - 2	Inorganic Chemistry Practical – II	4	2
	14	Core - 12 Practical - 3	Physical Chemistry Practical – II	4	2
	Subtotal				30

ORGANIC CHEMISTRY – I

UNIT – I: AROMATICITY AND NOVEL RING SYSTEM

Aromaticity: Benzenoid and non-benzenoid compounds – generations and reactions – sextet theory – MO theory – Huckel's rule – Annulenes and hetero annulenes – Anti and homo aromaticity – Fullerenes.

Novel ring system: Nomenclature of bicyclic and tricyclic systems – structure and synthesis of Adamantane – Congressane – Alternant and non – alternant – Azulene – and sydnones.

UNIT – II: ORGANIC REACTION MECHANISM AND METHODS

Reaction mechanism: Energy diagram of simple Organic reactions – Transition state and intermediate. Kinetic and Thermodynamic requirements of reactions – Baldwin rules for ring closure – Hammond Postulate and microscopic reversibility.

Methods: Kinetic and Thermodynamic control of product formation. Kinetic methods of determination: Rate law – Primary and secondary isotope effect. Non-Kinetic methods of determination: Testing and Trapping of intermediates, Isotopic labeling, Cross-over experiment and stereo chemical evidence.

LFER: Hammett equation – Physical significance of σ and ρ – Applications and Limitations – Taft equation.

UNIT – III: STEREOCHEMISTRY

Concept of chirality: – Enantiotopic, diastereotopic hydrogens and prochiral centres – axial and planar chirality – stereochemistry of compounds containing two dissimilar asymmetric carbons, ansa compounds and para cyclophanes.

R/S notations of Spiranes, allenes and Biphenyl ortho derivatives – E/Z notation of compounds containing one and two double bonds.

Stereospecific and stereoselective synthesis – Methods of Asymmetric synthesis including enzymatic and catalytic process – Cram's rule and Prelog's rule – Cram chelation model and Felkin – Aln model.

UNIT – IV: REARRANGEMENT REACTIONS

Types of rearrangements: Nucleophilic, electrophilic and Free radical and protrophic reactions.

Mechanism: Nature of migration – migrating aptitude and memory effects, ring enlargement and ring contraction rearrangements.

Reactions: Carbon to carbon migration: Wagner – Meerwein, Pinacol – Pinacolone, Benzil – Benzilic acid, Arndt – Eistert synthesis, Demjanov and dienone-phenol rearrangements.

Carbon to oxygen migration – Baeyer–Villiger, Hydro peroxide and Dakin rearrangements.

Carbon to Nitrogen migration – Lossen, Neber and Curtius rearrangements.

Miscellaneous: Von – Richter rearrangement and Fischer - Indole synthesis.

UNIT – V: REAGENTS IN ORGANIC SYNTHESIS

Gilman's reagent – LDA – DCC – 1,3 – dithane (umpolung synthesis) – Selenium dioxide. Fetizon's reagent – Lemieux – Von Rudloff reagent – Lemieux–Johnson reagent – Woodward and Prevost hydroxylation. Merrifield resin – Vaska's catalyst – Wilkinson's catalyst

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1. P. Sykes, 'A Guide book to mechanism in organic chemistry', Orient Longman, 1989.
2. S.M. Mukherji and S.P. Singh, 'Reaction mechanism in Organic Chemistry', Macmillan India Ltd, 1978.
3. M. Mukerji, S.P. Singh, and R.P. Kapoor, "Organic chemistry", Vol . I and II, Wiley Eastern Ltd., 1985.
4. J.March, 'Advanced organic chemistry', Fourth Edition, John Wiley and Sons, Newyork, 2006.
5. I.L. Finar, 'Organic Chemistry', Vol I and II, ELBS, fifth Editon, 2001.
6. F.A. Carey and R.A Sundberg, 'Advanced Organic Chemistry' (part A and B) plenum publishers, 2000.
7. E.S. Gould, 'Mechanism and structure in organic chemistry' Holt, Rinehart and Winston Inc., 1959
8. S.H. Pine, 'Organic Chemistry', 5th Edition, Mc Craw Hill International Edition, 1987.
9. E.L. Eliel, 'Stereochemistry of Carbon compounds, Mc Craw Hill 1999.
10. E.L. Eliel and S.H. Wilen, 'Stereochemistry of organic compounds', John Wiley and sons, Inc., 2003.

11. P.S. Kalsi, 'Stereo chemistry - Conformation and mechanism - New Age international (p) Ltd., 2000.
12. P.Ramesh, 'Basic Principles of organic stereochemistry', Meenu Publications, Madurai, First Edition, 2005.
13. D. Nasipuri, 'Stereochemistry of organic compounds - Principles and applications', Wiley Eastern Ltd., 1991.
14. J.M. Harris and C. Wamser - John, 'Fundamentals of organic reaction mechanism - Wiley and sons
15. F.A Carey, 'Organic Chemistry, Tata Mc Graw Hill, fifth reprint, 2005.
16. T.H. Lowry and K.S Richardson, 'Mechanism and Theory in Organic Chemistry', Houper and Row Publishers - Newyork, 1987
17. V.M. Potapov, 'Stereochemistry' - Mir Publishers, 1979
18. R.O.C.Norman, 'Principles of Organic Synthesis, Chapman Hall, London, 1993.
19. Raj K. Bansal, 'Reaction mechanism in Organic chemistry, Tata Mc Graw Hill, Third Editon, 10th reprint, 2005.
20. Gurdeep R. Chatwal, 'Reaction mechanism and Reagents in organic chemistry', Himalaya publishing House, Bombay 1992.
21. J.N. Gurtu and R. Kapoor, 'Organic Reactions and Reagents', S.Chand and company Pvt. Ltd.,
22. Gurdeep Chatwal, 'Organic Chemistry of Natural Products,' Vol.I and II, Himalaya Publishing House, Bombay 1992.
23. O.P. Agarwal, 'Chemistry of Natural Products,' Vol I and II, Goel publishing House, Meerut, 1984.
24. V.K. Ahluwalia and R.K. Parshar, 'Organic Reaction mechanism,' second Edition , Narosa publishing House, 2005.
25. H.O. House, 'Modern synthetic Reaction,' Second Edition , W.A. Benjamin, Inc., London, 1972.
26. R.K. Mackie, M.M. Smith and R.A. Aitken, 'Guide Book to Organic Synthesis' Second Edition, Longman Seientific and Technical, Singapore, 1990.
27. K. Nakanishi, 'Natural Product Chemistry,' Blackie Publications, Vols, I, II, III.
28. R.H. Thomson, 'Chemistry of Natural Products - Wiley, Newyork, 1996.
29. R.T. Morrison and R.N. Boyd, 'Organic Chemistry' sixth Edition, Prentice Hall, 1994.
30. Michael B. Smith, 'Organic Synthesis,' Mc Graw Hill international Edition , 1994.
31. Bhupinder Mehta, Manju Mehta, Organic Chemistry, PHI Learning, New Delhi, 2011.
32. Organic chemistry by Clayden, Greeves, Warren & Wothers.
33. Organic chemistry by John McMurry.
34. Organic chemistry by L.G. Wade. JR.
35. Named Organic reactions by Thomas laue & Andreas Plagens.

INORGANIC CHEMISTRY – I

Unit – I: CHEMICAL BONDING

Valence Bond theory: Linear combination of A.O's in hybridization - stereochemistry of the hybrid orbitals - Calculation of s and p characters of equivalence and non-equivalence of hybrid orbitals – **VSEPR theory** – Walsh diagrams - Bent's rule.

M.O. theory – symmetry and overlap in M.O's - σ , π , δ M.O's- ϕ and μ bonds (Delta and quadrupole bond formation) – M.O. diagrams of hetero nuclear diatomic molecules (CO, NO) and triatomic molecules (BeH₂, CO₂).

Ionic Bond: Lattice energy – Born-Landé equation, Born Haber cycle and numerical problems involving it for the calculation of electron affinity or lattice energy – Kapustinskii equation.

Unit – II: REDOX POTENTIAL AND NON-AQUEOUS SOLVENTS

Redox potential: Applications of redox potential to inorganic reactions - factors affecting redox potential.

Acid-Base - Concept of acids and bases, Hard Soft Acid Base (HSAB) concept, symbiosis in hardening or softening a centre - levelling effect - acid-base strength verses HSAB principle.

Non-aqueous solvents: Classification of protic and aprotic solvents. Self ionization and leveling effect. Reactions in non-aqueous solvents - acid-base reactions, complex formation solvolysis, solvation - reactions in liquid ammonia and liquid SO₂. Use of ionic liquids in synthesis.

Unit – III: SOLID STATE CHEMISTRY

Description of crystal structures: calcite, zinc blende, wurtzite, rutile, fluorite, antifluorite, CsCl, CdI₂, K₂NiF₄ - spinels and perovskite. Crystal defects in solids - line and plane defects - Point defects - Schottky and Frenkel defects - Non-stoichiometric defects - Colour centres - Solid electrolytes and their applications.

Band theory - optical and electrical properties of semiconductors. Super conductivity - high temperature super conductors, properties and applications - BCS theory - Cooper electrons - Meissener effect and levitation.

Unit – IV: LANTHANIDES AND ACTINIDES

Correlation of electronic structures, occurrence, extraction from ores and separation methods (Ion exchange and solvent extraction method) and properties of the elements - Chemistry of separation of Pu from U and fission products - Common and uncommon oxidation states - Comparison with transition elements - Lanthanide and actinide contractions – magnetic characteristics of lanthanides and actinides - Similarities between actinides and lanthanides - Use of lanthanide complexes as shift reagents.

UNIT –V: NUCLEAR CHEMISTRY

Atomic nuclei : Nuclear shell structure – nuclear reactions : types, Q-value, threshold energy, cross sections and excitation functions. Direct nuclear reactions – transmutation reactions: stripping and pick-up – high energy reactions : neutron evaporation and spallation – heavy ion reactions – photonuclear reactions. Nuclear fusion and stellar energy – nuclear fission : mass and charge distribution of fission products – fission energy – fission neutrons – theory of nuclear fission – spontaneous fission. Waste disposal and atomic power project in India.

Radio isotopes: Preparation - Analytical applications: radio chromatography, neutron activation analysis, neutron absorptiometry and radiometric titrations.

REFERENCES

1. James E. Huheey, Ellen A. Keiter and Richard L. Keiter, *Inorganic chemistry: principles Structure and Reactivity*, 4th Ed., Harper College Publishers, 1993.
2. F. Albert Cotton, Geoffrey Wilkinson, Carlos A. Marilo and Manfred Bochman, *Advanced Inorganic Chemistry*, Wiley Interscience Publication, 6th Ed., 1999.
3. D.F. Shriver, P.W. Atkins and C.H. Langford, *Inorganic Chemistry*, ELBS, Oxford University Press, 1994.
4. N.N. Greenwood and Earnshaw, *Chemistry of the Elements*, Pergamon Press, 2nd Edition, 1997.
5. K.F. Purcell and J.C. Kotz, *Advanced Inorganic Chemistry*, Saunders Golden Publishers.
6. B.E. Douglas, D.H. McDaniel and J.J. Alexander, *Concepts and Models of Inorganic Chemistry*, John Wiley and Sons Ltd. 2nd Ed., 1983.
7. J.D. Lee, *Concise Inorganic Chemistry*, ELBS, 2006.
8. A. R. West, *Solid State Chemistry and its Application*, John Wiley & Sons, (Asia), 1998.

9. T. Kutty, J. Tareen, *Fundamentals of Crystal Chemistry*, University Press, 1st Ed., 2001.
10. L.V. Azaroff, *Introduction to Solids*, Tata McGraw Hill Publishing Ltd., India, 1989.
11. C. Kittel, *Introduction to Solid State Physics*, Wiley Eastern Ltd., 5th Ed., 1993.
12. H.V. Keer, *Principles of the Solid State*, Wiley Eastern Ltd., 1993.
13. D.K. Chakrabarthy, *Solid State Chemistry*, New Age International.
14. A.F. Wells, *Structural Inorganic Chemistry*, Oxford Science Publication, London, 1979.
15. B. Sahoo, N. C. Nayak, A. Samantaray, P.K. Pujapanda, *Inorganic Chemistry*, PHI Learning, New Delhi, 2012.
16. Samuel Glasstone, *Source Book of Atomic Energy*, East West Pvt.Ltd., 1969.
17. H.J. Arnikar, *Essentials of Nuclear Chemistry*, Wiley Eastern Ltd., 4th Edition, 2000.
18. G. Friedlander, J.W. Kennedy, E.S. Macies and Julian Malcolm, *Nuclear and Radiation Chemistry*, A. Wiley Interscience publication, 1981.

PHYSICAL CHEMISTRY - I

UNIT-I Thermodynamics

Concepts of partial molar properties – partial molar free energy, chemical potential, partial molar volume and its significance. Gibbs-Duhem equation, Gibbs-DuhemMargulus equation. Determination of partial molar volume: Graphical method, intercept method and apparent molar volume method. Concept of fugacity; Determination of fugacity by graphical method and compressibility factor method. Concept of Activity and activity coefficient. Determination of activity and activity coefficients for non-electrolytes.

UNIT-II Phase Rule

Phase rule and Lever rule-Derivation of phase rule from the concept of chemical potential. Plots for a mixture of three liquids consisting of one, two and three pairs of partially miscible liquids.

Thermodynamics of irreversible processes

Thermodynamics of irreversible processes with simple examples. Entropy production-rate of entropy production, entropy production in chemical reactions. Onsager reciprocal relations- validity and verification. Thermoelectric phenomena- Electro kinetic and thermo mechanical effects. Application of irreversible thermodynamics to biological and non-linear systems.

UNIT-III Quantum Chemistry - I

Inadequacy of classical mechanics – black body radiation – Planck's quantum concept – photoelectric effect – Bohr's theory of hydrogen atom – hydrogen spectra – wave-particle dualism – uncertainty principle – decline of old quantum theory. Schrödinger equation – postulates of quantum mechanics – operator algebra: linear operator, Hermitian operators, eigenfunctions and eigenvalues, angular momentum operator – commutation relations and related theorems – orthogonality and normalization.

UNIT IV Statistical Thermodynamics

Thermodynamic probability – probability theorems – relation between entropy and probability (Boltzmann-Planck equation), ensembles, phase space, Ergodic hypothesis, microstates and macrostates, Maxwell-Boltzmann distribution law – partition functions – translational, rotational, vibrational and electronic partition functions. Relationship between partition functions and thermodynamic properties – calculation of equilibrium constants from partition functions – heat capacities of monatomic crystals – Einstein theory and Debye theory. Quantum statistics – Bose-Einstein (B.E.) and Fermi-Dirac

(F.D.) distribution equations – comparison of B.E. and F.D. statistics with Boltzmann statistics . Concept of negative Kelvin temperature.

UNIT-V MOLECULAR SPECTROSCOPY (Introduction and Rotational Spectroscopy)

Electromagnetic radiation: quantization of energy; rotational, vibrational, and electronic energy levels and transitions in molecules; regions and representation of spectra. Width of spectral lines-collision broadening, Doppler broadening, Heisenberg uncertainty principle. Intensity of spectral lines-selection rules and transition probability, transition moment integral. Diatomic molecules as rigid rotors: rotational energy levels, intensity of spectral lines, selection rules, effect of isotopic substitution. Diatomic molecules as non-rigid rotors: rotational transitions. Rotational spectra of linear and symmetric top polyatomic molecules.

REFERENCES

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2. Y. V. C. Rao, An Introduction to Thermodynamics, Wiley Eastern, 1993.
3. Physical Chemistry, R.S.Berry, S.A.Rice and J.Ross, Oxford, 2001.
4. M. Ladd, Introduction to Physical Chemistry, Cambridge, 1998.
5. D. A. McQuarrie and J. D. Simon, Physical Chemistry, A molecular Approach, Viva, 1998.
6. F. W. Sears & G. L. Salinger, Thermodynamics, Kinetic Theory & Statistical Thermodynamics, Narosa, 1986.
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9. I. N. Levine: Quantum Chemistry, Prentice Hall India, 1994.
10. S. N. Datta: Lecture on Chemical bonding and quantum chemistry, 1998.
11. A. K. Chandra, Introductory Quantum Chemistry; 4th Ed., Tata McGraw Hill, Noida, 1994.
12. D. A. Mcquarrie, Quantum Chemistry; University Science Books, Sausalito, 2008.
13. I. N. Levine, Quantum Chemistry; 5th Ed., Prentice Hall, New Jersey, 2000.

14. R. K. Prasad, Quantum Chemistry; 4th Ed., New Age International Publishers, New Delhi, 2014.
15. K. Rajaram and J.C. Kuriacose, Thermodynamics For Students of Chemistry, 2nd Edition, S.L.N. Chand and Co, Jalandhar, 1986.
16. J. Rajaram and J. C. Kuriacose, Thermodynamics for Students of Chemistry - Classical, Statistical and Irreversible; Pearson Education, New Delhi, 2013.
17. I.M. Klotz and R.M. Rosenberg, Chemical thermodynamics, 6th edition, W.A.Benjamin Publishers, California, 1972.
18. M.C. Gupta, Statistical Thermodynamics, New Age International, Pvt., Ltd., New Delhi, 1995.
19. D.A. McQurrie and J.D. Simon, Physical Chemistry , A Molecular Approach, Viva Books Pvt. Ltd., New Delhi, 1999.
20. R.P. Rastogi and R.R. Misra, Classical Thermodynamics, Vikas Publishing, Pvt., Ltd., New Delhi, 1990.
21. Horia Metiu, Physical Chemistry, Thermodynamics; Taylor and Francis, Singapore, 2006.
22. C. N. Banwell, Fundamentals of Molecular Spectroscopy; 4th Ed., McGraw Hill Education, Noida, 1994.
23. G. M. Barrow, Introduction to Molecular Spectroscopy; McGraw Hill, New York, 1964.

ADVANCED TOPICS IN CHEMISTRY – I

(Semester - I)

Unit – I : Green Chemistry

Need of green Chemistry – Anastas twelve principles of green Chemistry – Concept of atom economy – Green Reactions – Microwave assisted reactions – Superiority of microwave exposure over thermal reactions – Functional groups – Transportation – Condensation reactions – Oxidation and reduction reactions.

Unit – I : Nano Chemistry

Definition and terminology of Nano particles and Nano structural materials – Synthesis of Nano particles by Physical approaches (Laser ablation, evaporation and sputtering) and Chemical approaches (reduction of metal ions by Citrate and borohydride, Polyol synthesis) green synthesis – Optical and electronic properties of Nano materials.

Unit – III : Applied Electro Chemistry

Principles of Corrosion – Definition – Cost of Corrosion – Electro chemical principles of Corrosion – Corrosion monitoring methods - Coupon (weight loss) – electrical resistance – gasometric – Potentiodynamic polarisation – impedance – hydrogen permeation – Corrosion inhibition – definition – Classification of inhibitors based on electrode process – mechanism of inhibitor action in acidic medium.

Unit – IV : Analytical Chemistry

Principle and Techniques of GC – MS, HPLC, Cyclic voltammetry, Coulometry and Amperometry.

Theoretical and practical aspects of Colorimetry analysis - Flame emission and Atomic absorption spectroscopy - Advantages of atomic absorption spectrometry over flame photometry.

Unit – V : Industrial Chemistry

Nuclear fuels for various types of Nuclear reactors – Hydrogen as fuel in the future, Hydrogen storage materials – Solar energy – fuel from Sun light – Splitting of water – Hydrogen from Sun light – Hydrogen economy – Fuel cells – batteries – Photovoltaics – Stealing the Sun.

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3. Green chemistry – Environment friendly alternatives – edited by rashmi sanghi & M.M. Srivastava, Narora Publishing House, (2003)
4. Kenneth J. Klabunde, Nanoscale materials in chemistry, John Wiley and sons, Inc. Publication, 2001.
5. K.Klabunde and G.Sergeev, Nano chemistry, 2006.
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8. T. Pradeep, *NANO: The Essentials - Understanding Nanoscience and Nanotechnology*, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2007.
9. C. Brechignac, P. Houdy, M. Lahmani, *Nanomaterials and Nano chemistry*, Springer 2006.
10. An introduction to metallic corrosion and its prevention by Raj Narayanan.
11. Vogel's Textbook of Quantitative chemical Analysis by G.H. Jeffery, J. Bassett, J. Mendham, and R.C. Denney, Longman Scientific & Technical, 5th edition, 1989.
12. Electro analytical chemistry – Basil H. Vassons and Galen W. Ewing, Wiley Interscience publication 1983.
13. Chemistry Experiments for instrumental methods – Donald T. Sawyer, William R. Heineman, Janice M. Beebe, John Wiley & Sons, 1984.
14. D.A. Skoog and D.M. West – fundamentals of Analytical Chemistry
15. D.A. Skoog – Instrumental Methods of Analysis
16. Skoog, West, Holler and Crouch – Analytical Chemistry – An Introduction
17. Energy resources and the environment, V.K. Prabhakar, 2001.
18. Fundamental Concepts of Applied chemistry, Jayashree Ghosh, S.Chand, 2005

ORGANIC CHEMISTRY – I

A. Separation of Organic mixture:

- (i) Separation of two component mixture and determination of their physical Constants.
- (ii) Separation and analysis of at least **six** two component mixture. The students are expected to determine the physical constants for both the components as well as their Derivatives.
- (iii) Analysis may be performed in micro (or) macro scale depending upon the Conditions of the laboratory

B. For Class Work Only:

- (1) Separation of Caffeine from Tea / Coffee.
- (2) Separation of green, blue, red inks by TLC method

REFERENCES:

1. F. C. Mann and B. C. Saunders, Practical organic chemistry, Fourth edition, ELBS, 1970.
2. A.I. Vogel, A Text book of Practical organic chemistry.
3. A.I. Vogel, A Text book of Quantitative Organic Analysis, 1989.
4. Raj K. Bansal, Laboratory Manual of Organic Chemistry, Second Edition, Wiley Eastern Ltd., 1990.
5. Moore, Dalrympk and Rodig, Experimental methods in organic chemistry, 3rd edition, Saunders College publishing, The Oxford Press, 1982.
6. Bassett et.al, A Text Book of Quantitative Inorganic Analysis, ELBS, 1986
7. Roberts, Gilbert, Reidwald-Wingrove. An Introduction to Experimental Organic Chemistry, 1969.

INORGANIC CHEMISTRY - I

1. Qualitative analysis of inorganic mixture containing two familiar and two less familiar cations Pb, Cu, Bi, Cd, Sb, Zn, Co, Ni, Mn, Ca, Ba, Sr, W, Tl, Te, Se, Mo, Ce, Th, Zr, V, U, Ti and Li.

REFERENCES:

1. G. Svehla, *Vogel's qualitative inorganic analysis*, 7th Edition, Pearson Education India, 2008.
2. V. Ramanujan, *Inorganic Semi-micro Qualitative Analysis*, 3rd Edition., National Publishing Company, Chennai, 1990.

PHYSICAL CHEMISTRY -I

I. Conductometry

Conductometric Titrations

- a. Estimation of HCl and AcOH in a mixture
- b. Estimation of NH_4Cl and HCl in a mixture
- c. Conductometry- solubility product of sparingly soluble silver salts.

II. Thermometry

- a. Determination of Solution enthalpy of
 - i. oxalic acid-water
 - ii. ammonium oxalate-water
 - iii. Potassium dichromate-water

III. Kinetics -Acid hydrolysis of ester –comparison of strength of acids.

ORGANIC CHEMISTRY – II

Unit – I: ULTRAVIOLET, INFRA – RED SPECTROSCOPY, ORD AND CD

UV: The absorption laws – Types of electronic transitions – effect of solvents and Hydrogen bonding on λ_{\max} values. – Woodward – Fieser rules to calculate λ_{\max} values of conjugated dienes and α,β - unsaturated ketones.

IR: Characteristic IR absorptions of different functional groups – factors influencing absorption of carbonyl and hydroxyl groups – electronic effect and effect of hydrogen bonding, Fermi resonance and Finger print region.

ORD and CD: Optical rotatory dispersion (ORD): Octant rule – alpha - halo ketone rule and their Applications-Circular Dichroism.

Unit-II : Aromatic nucleophilic substitution Reaction and Addition to carbon-carbon multiple bonds and carbon - oxygen double bond.

Aromatic nucleophilic substitution reaction : Unimolecular, Bimolecular and Benzyne mechanisms - Reactivity, effect of substrate, leaving group and attacking nucleophile-typical reaction as oxygen and sulphur as nucleophile - Bucherer and Rosenmund reaction- Smiles rearrangement.

Catalytic hydrogenation - Birch reduction - Dieckmann condensation - Mannich reaction - Wittig reaction - Sharpless asymmetric epoxidation - addition of hydrogen halides to carbon - carbon double bond - addition of boranes, Michael addition (1,2 and 1,4)

Addition of dialkyl groups to triple bonds. Addition of hydrides – LiAlH_4 and NaBH_4 .

Unit-III : Reactive intermediates and rearrangements

Carbenes: Generation, stability, structure, and reactivity of carbenes-Wolff rearrangement of acyl carbenes and its synthetic applications.

Nitrenes: Generation, stability, reaction of nitrenes- Mechanism of rearrangements through Nitrene intermediate: Schmidt, Hoffmann, Beckmann rearrangements.

Carbanion: Generation, Structure, Stability and reaction of carbanion- Mechanism of rearrangements involving carbanion as intermediate: Steven, Sommelet- Hauser and Favorski rearrangements.

Aryne: Generation, Structure, Stability, reactions and trapping of aryne- cine substitution.

Unit – IV: ALKALOIDS AND ANTIBIOTICS

Alkaloids: Degradation studies – HEM , Emde and Von – Braun – Structural elucidation and synthesis of Quinine, Morphine, Cocaine, Lysergic acid and Atropine. Synthesis of Reserpine and PaPaverine – Biosynthesis of tyrosine, tryptophan.

Antibiotics: Structure and synthesis of penicillin, cephalosporin – C, chloramphenicol and Streptomycin.

Unit – V: VITAMINS AND TERPENOIDS

Vitamins: Structural elucidation, synthesis of vitamins – A₁, B₁ and C - synthesis of vitamins B₂, B₆,D and E.

Terpenoids: Structural elucidation, synthesis of α -Pinene, Camphor, α -Cadinene, Zingiberene and squalene - synthesis of α -Santonin and Gibberelic acid. Bio synthesis of mono and di terpenoids.

REFERENCES

1. J. March, 'Advanced organic chemistry,' Fourth Edition, John Wiley and sons, New York, 2006.
2. R.T. Morrison and R.N. Boyd, 'Organic Chemistry', sixth Edition, Prentice Hall, 1994.
3. I.L. Finar, 'Organic Chemistry', volume 2, sixth Edition, Pearson Education Inc., Singapore, 2006.
4. Y.R. Sharma, 'Fundamentals of Organic spectroscopy'.
5. P.S. Kalsi, 'Spectroscopy of organic spectroscopy', second Edition, New Age International Publishers Limited, 1995.
6. Jag Mohan, 'Organic Analytical Chemistry Theory and Practice, 'Narosa Publishing House, 2003.
7. W.Kemp, 'Organic spectroscopy', Third Edition, Macmillan, 1994.
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23. E.L. Eliel, stereochemistry of carbon compounds – Mc Craw Hill, 1999.
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25. F.A. Carey, Organic chemistry – Tata Mc Graw Hill, Delhi, 5th edition 2005.

INORGANIC CHEMISTRY – II

Unit – I: BONDING IN COORDINATION COMPOUNDS

CFT and LFT: Basic features of CFT and LFT. Splitting of the metal d - orbitals in T_d , O_h and square planar symmetries - Jahn-Teller distortion in O_h and T_d complexes - Static and dynamic J.T distortions. Application of CFT: Magnetic Properties - Spectral properties - Spectrochemical series - Kinetic properties. **CFSE:** Calculation of CFSE in O_h and T_d complexes - Contribution of CFSE to M-L bond energy, M-L step-wise stability constants, Hydration energies of M^{n+} - Lattice energy - Preferred stereochemistry - Site selection of the cations in spinel and inverse spinel and OSSE.

MOT: π -bonding and π -bonding in O_h complexes - Effect of π -bonding on the value of Δ ($10 Dq$). MOT for square planar ($16 e^-$) and T_d ($18 e^-$) complexes. Application of MOT to explain spectrochemical series.

Unit – II: STABILITY AND REACTIONS OF COORDINATION COMPOUNDS

Stability of complexes - Thermodynamic and kinetic stabilities - stepwise and overall stability constants of the metal complexes - factors affecting stability - chelate and template effects - Determination of stability constants and composition of the complexes: Bjerrum's method, potentiometric determination, spectrophotometric method, ion-exchange method, polarographic method, continuous variation (Job's) method.

Reactions of complexes: Lability – inertness - Ligand substitution reactions of square planar complexes - Trans effect and trans influence - Theories of trans effect - use of trans effect in synthesis of complexes - Substitution reactions in octahedral complexes - acid hydrolysis, base hydrolysis and anation reactions - Electron transfer reactions - Inner sphere and outer sphere processes - complementary and non-complementary reactions.

Unit – III: ELECTRONIC AND INFRARED SPECTROSCOPY

Electronic spectroscopy: Selection rules for electronic transitions - Line width and shape - Hole formalism - LS Coupling and jj coupling schemes and determination of term symbols – Splitting of terms – Orgel and Tanabe Sugano diagrams – Electronic spectra of 1st row transition metal complexes - Evaluation of $10 Dq$, β and B' for octahedral d^2 and d^8 systems. Charge transfer spectra - types - Effect of tetragonal distortion and spin - orbit coupling on spectra. Electronic spectra of lanthanide and actinide complexes.

Infrared spectroscopy: Selection rules - calculation of force constants of IR vibrations. Changes in the IR spectra accompanying changes in symmetry upon coordination,

differentiation of coordinated water and lattice water. Application in the study of isomerism - linkage and geometrical isomerism.

Unit – IV: MAGNETIC PROPERTIES OF METAL COMPLEXES

Magnetic properties: Types of magnetism – magnetically diluted and concentrated substances - temperature dependence of magnetic susceptibility of different types of magnetic materials. Paramagnetism and thermal energy – quenching of orbital contribution to magnetic moment by CF – orbital contribution from the excited state through spin – orbit coupling. Mixing of the excited terms with the ground state term through second order Zeeman effect. Magnetic properties of 1st row Transition Metal complexes: comparison of the magnetic properties of O_h , T_d and square planar Fe(II), Co(II), Ni(II) and Cu(II) complexes. Magnetic properties of complexes with A, E and T ground states – magnetic properties of II and III Transition Metal complexes. Application of magnetic moment – oxidation state, structure determination.

Unit V: INORGANIC POLYMERS AND METAL CLUSTERS

Inorganic polymers: General characteristics, degree of polymerization, catenation and heterocatenation - silicates - classification and structure - property correlation - Polyacids - structures of isopoly and heteropoly anions - Polymeric sulphur nitride - Borazines - Phosphazenes - Phosphazene polymers - Boranes and carboranes - Structure and bonding in boranes - Molecular frame work of hydrides of boron skeletal electron pair counting and Wade's rule.

Structure and Bonding of Metal clusters: Dinuclear Clusters: Cu(II) carboxylate, Chromium(II) acetate, and $[M_2Cl_8]^{4-}$ (M = Mo and Re) - Trinuclear Clusters: $[M_3(CO)_{12}]$ (M = Fe, Ru, Os) - Tetranuclear Clusters: $[M_4(CO)_{12}]$ (M = Co, Rh, Ir) - Hexanuclear Clusters: $[Nb_6Cl_{12}]^{2+}$, $[Os_6(CO)_{18}]^{2-}$ and $[Mo_6Cl_8]Cl_4$ – Capping rule – poly atomic Zintl ions.

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2. F. Albert Cotton, Geoffrey Wilkinson, Carlos A. Murillo and Manfred Bochman, *Advanced Inorganic Chemistry*, Wiley Interscience Publication, 6th Ed., 1999.
3. N.N. Greenwood and Earnshaw, *Chemistry of the Elements*, Pergamon Press, 2nd Edition, 1997.

4. D. Bannerjee, *Coordination Chemistry*, Tata McGraw Hill, 1993.
5. K.F. Purcell and J.C. Kotz, *Advanced Inorganic Chemistry*, Saunders Golden Publishers.
6. B.E. Douglas, D.H. McDaniel and J.J. Alexander, *Concepts and Models of Inorganic Chemistry*, John Wiley and Sons Ltd., 2nd Ed., 1983.
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14. David W. H. Rankin, Norbert W. Mitzel, Carole A. Morrison, *Structural Methods in Molecular Inorganic Chemistry*, John Wiley & Sons Ltd., 2013.
15. Kazuo Nakamoto, *Infrared and Raman Spectra of Inorganic and Coordination Compounds, Part B: Applications in Coordination, Organometallic, and Bioinorganic Chemistry*, John Wiley and Sons, Inc, 6th Ed., 2009.
16. C.N.R.Rao, *Chemical Applications of Infrared Spectroscopy*, Academic Press, New York, 1963.
17. Kenneth J. Klabunde, *Nanoscale materials in chemistry*, John Wiley and sons, Inc. Publication, 2001.
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22. C. Brechignac, P. Houdy, M. Lahmani, *Nanomaterials and Nano chemistry*, Springer 2006.

PHYSICAL CHEMISTRY-II

UNIT-I Quantum Mechanics I

Setting up and solving Schrodinger wave equation and arriving solution for Particle in 1D box, Particle in a ring, 3D Rectangular box, 3D cubical box, the harmonic oscillator, the rigid rotator, and the hydrogen atom. Degeneracy and degenerate wave functions, Quantum mechanical tunnelling. Shapes and nodal properties of orbitals – Space quantisation.

UNIT-II Quantum Mechanics II

Electron spin, Anti symmetry and Pauli's exclusion principle – Slater determinantal wave functions. Approximation methods-The Variation theorem; Linear Variation Principle, Perturbation theory. Applications of Variation Method and Perturbation Theory to the Helium atom. Born-Oppenheimer approximation, VB and MO theory, for H_2^+ molecular ion and H_2 molecule problems, Hartree Fock Self consistent field method for Helium atom. Hückel Molecular Orbital Theory and its application to ethylene, butadiene and benzene.

UNIT - III Electrochemistry - I

Arrhenius theory, Derivation and Validity of Debye-Huckel Theory, Debye-Huckel-Onsager conductance equation, Deviations from Onsager equation. Debye-Falkenhagen effect and Wien effect. Activity of electrolytes, Determination of activity and activity coefficient using Debye-Huckel theory. Debye-Huckel Limiting law, Debye-Huckel-Bronsted equation. Definition and Determination of Transference number. Abnormal transference number. Electrified interfaces-Lipmann equation derivation. Electrical Double Layer, Structure of electrical double layer Helmholtz-Perrin, Guoy-Chapmann and Stern models of electrical double layer- Applications and limitations. Kinetics of electrode reaction-Butler-Volmer equation, Tafel equation.

UNIT - IV Electrochemistry - II

The Poisson-Boltzmann equation and its solutions. Electrocapillary phenomena-Zeta potential and its applications. Electrophoresis and related phenomena- The electroviscous effect, sedimentation Potential, Electrophoresis. Effect of electrical double layer- Electrocapillarity, Double layer capacitance Corrosion and passivation of metals – Pourbaix diagram – Evans diagram – fuel cells – primary and secondary fuel cells – electrodeposition – principle and applications.

Principles and applications of Polarography-Instrumentation, Interpretation of current voltage curves, tests for reversibility, determination of 'n' values (usefulness of Ilkovic equation), polarographic maxima, current time curves, Modern developments, Oscillographic polarography, AC polarography – Cyclic Voltammetry, advantages over

polarographic techniques – Test of reversibility of electron transfer reactions – Chronopotentiometry – apparatus used, advantages over polarography – controlled potential coulometry.

UNIT-V Photochemistry and Radiation Chemistry:

Photochemistry: Introduction. Laws of photochemistry, Quantum yield and its determination. Physical properties of electronically excited molecules: excited state dipole moment, acidity constant and redox Potentials. Photophysical processes in electronically excited molecules: Jablonski diagram – Intersystem system crossing internal conversion, fluorescence, phosphorescence and other deactivation processes. Photosensitisation chemiluminescence and bioluminescence - Stern-Volmer equation and its applications – mechanisms of quenching – electron transfer – energy transfer– experimental techniques in photochemistry –chemical actinometers.

Radiation Chemistry

Differences between radiation chemistry and photochemistry – sources of high energy radiation and interaction with matter – radiolysis of water, solvated electrons – Definition of G-value- Dosimetry and dosimeters in radiation chemistry- application of radiation chemistry.

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2. S. N. Datta: Lecture on Chemical bonding and quantum chemistry, 1998.
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4. P. W Atkins: Molecular Quantum Mechanics, Clarendon Press, Oxford, 1983.
5. R. K. Prasad: Quantum Chemistry through Problems and Solutions, New Age International, 1997.
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13. L. Antropov , "Theoretical Electro Chemistry", Mir Publications , Moscow , 1977.

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21. R.P.Wayne, Photochemistry, Butterworths, London, 1970.
22. G.Hughes, Radiation Chemistry, Oxford University Press, 1973.
23. J.W.T Spinks and R.J. Woods, Introduction to Radiation Chemistry, 2nd edn., John Wiley & Sons, 1976.

ADVANCED TOPICS IN CHEMISTRY - II

UNIT I: Forensic and computer applications in Chemistry

Forensic science: Finger printing, forensic serology, hair and fiber analysis, explosive residue, glass comparisons, drug analysis, bullet and cartridge analysis.

Introduction of computer: molecular modelling simulation and animation. World Wide Web and Chemical Databases on internet, Techniques of information search, Chems sketch and Chemdraw.

UNIT -II: Applications of nanomaterials

Applications of nanomaterials: Applications in catalysis - Organic transformations and fuel cells - Environmental application - Water purification, air purification - Nano particles as sensors - **Nanocomposites** - Polymer-based Nanocomposites - Polyamide/clay Nano composites - Synthesis, characterization and properties of Nylon 6 - clay hybrid - Polystyrene/clay Nanocomposites - syndiotactic polystyrene/clay Nano composites, properties. Poly(butylenes terephthalate) (PBT) based nano composites. Bio-Nanocomposites- properties and applications.

UNIT III : Industrial polymer

Important industrial polymers – synthesis and applications of poly tetra fluoro ethylene (TEFLON), ion exchange resins. Synthetic route, structure and applications of engineering plastics - Acrylonitrile butadiene styrene (ABS), Poly amides (PA), Poly ethylene terephthalate (PET), Polyphenylene Oxide (PPO), Poly sulphone (PSU), Poly ether ether ketone (PEEK), Poly amides, Poly phenylene sulphide(PPS).

UNIT IV : Medicinal chemistry

Drug Discovery, Design and development: Identification of diseases and corresponding targets, Bio assays and leads. Stereochemistry and solubility issues in drug design.

Structure Activity Relationship (SARS): Changing size and shape- introduction of new substituents. Quantitative structure activity relationships (QSARS), Lipophilicity – electronic and steric effects- Hansch Analysis – Top liss decision tree. Chemical and process development of drugs.

Preclinical trials: Pharmacology, Toxicology, metabolism and stability studies- formulation.

Clinical trials: Phase I- IV Studies- ethical issues. Patent protection.Regulation.

UNIT V: Bio-organic chemistry:

Characteristics of enzymes- mechanism of enzyme action- chymotrypsin- antibodies of enzymes- biological energy- ATP, NADH, NADPH, FADH₂ as electron carriers- Co – enzyme A as universal carriers of acyl groups- glycolysis- citric acid cycle- urea cycle – Link between glycolysis and citric acid cycle- lipid metabolism- biological oxidation- biometric chemistry cyclodextrins- Calixarenes as enzyme model.

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<http://www.acsnanotation.org/>, Home page of Prof.Ned Seeman-
<http://seemanlab4.chem.nyu.edu>,
15. F.W.Bill Meyer, Text book of polymer science, III Edition, John Willey and sons, New York.
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26. The Organic chemistry of Drug Design and Drug Action by Richard B. Silverman, Academic press, 2nd edition, 2004.
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ORGANIC CHEMISTRY PRACTICAL – II

A. Estimation

- (i) Estimation of phenol
- (ii) Estimation of aniline
- (iii) Estimation of ascorbic acid

B. List of single stage preparations:

- (i) Preparation of 1,2,3,4 -Tetrahydro carbazole from cyclohexanone.
- (ii) Preparation of Resacetophenone from Resorcinol.
- (iii) Preparation of p-benzoquinone from hydroquinone.
- (iv) Preparation of Bis-2-Naphthol.
- (v) Preparation of Di Benzylidene acetone.
- (vi) Preparation of anthraquinone from anthracene
- (vii) Preparation of benzophenone oxime from benzophenone
- (viii) Preparation of Nerolin from β -Naphthol
- (ix) Preparation of anthranilic acid from Phthalimide
- (x) Preparation of Benzilic acid from Benzil

Note : Each student is expected to submit both Crude and recrystallized samples of the preparation during their regular practical for evaluation at the time of practical examinations.

C. For Class Work Only :

1. Download the following spectra from **internet** and give interpretation.

I. Differentiate the following pair by UV- spectra

- (a) Trans stilbene and its cis isomer.
- (b) Vinyl methyl ketone and acetone.
- (c) Vinyl methyl ketone in two solvents such as n-Hexane and alcohol.

II. Differentiate the following pair by IR spectra

- (a) para and ortho hydroxy benzoic acid.
- (b) p-nitro and p-amino acetophenone.
- (c) Maleic acid and fumaric acid.

(2) Separation of Caffeine from Tea / Coffee.

REFERENCES

1. F.C.Mann and B.C.Saunders, Practical organic chemistry, Fourth edition, ELBS, 1970.
2. A.I. Vogel, A Text book of Practical organic chemistry.
3. A.I. Vogel, A Text book of Quantitative Organic Analysis, 1989.
4. Raj K. Bansal, Laboratory Manual of Organic Chemistry, Second Edition, Wiley Eastern Ltd., 1990
5. Moore, Dalrympk and Rodig, Experimental methods in organic chemistry, 3rd edition, Saunders College publishing, The Oxford Press, 1982.
6. Bassett et.al., A Text Book of Quantitative Inorganic Analysis, ELBS, 1986.
7. Roberts, Gilbert, Reidwald-Wingrove An Introduction to Experimental Organic Chemistry, 1969.

INORGANIC CHEMISTRY PRACTICAL - II

A. Analysis of Mixture of Cations by Complexometric titrations

1. Estimation of Cu(II) by EDTA titration in the presence of either Pb(II) or Ba(II) (Separation of Pb(II) or Ba(II) by precipitation).
2. Estimation of Zn(II) by EDTA titration in the presence of either Pb(II) or Ba(II) (Separation of Pb(II) or Ba(II) by precipitation).
3. Estimation of Ca(II) and Pb(II) in a mixture by EDTA titration (Selective titration by control of pH).
4. Estimation of Cr(III) and Fe(III) in a mixture by EDTA titration (Kinetic masking).
5. Estimation of Mg(II) and Mn(II) in a mixture by EDTA titration (Demasking by F⁻)
6. Estimation of Pb and Sn in Solder alloy by EDTA titration (Demasking by F⁻).
7. Estimation of Ca(II) ion in an antacid or diet supplement pill by EDTA titration (Substitution titration).

B. Photocolorimetric Analysis of Cations (Course work only)

Estimation of Fe, Ni, Cr, Mn, Cu and NH₄⁺. (Any four experiments)

REFERENCES:

1. G.H. Jeffery, J. Bassett, J. Mendham, R.C. Denney, *Vogel's Textbook of quantitative chemical analysis*, Longman Scientific and Technical, 5th Ed., England, 1989.
2. Douglas A. Skoog, Donald M. West, F. James Holler, Stanley R. Crouch, *Fundamentals of Analytical Chemistry*, 8th Ed., Brooks/Cole-Thomson Learning, USA, 2004.
3. I.M. Kolthoff, V.A. Stenger, *Volumetric Analysis*, 2nd Ed., Interscience Publishers, New York, 1947.

PHYSICAL CHEMISTRY PRACTICAL-II

I Conductometric experiments

- (i) Estimation of K_2SO_4 using $BaCl_2$
- (ii) Estimation of CH_3COOH and CH_3COONa in a Buffer solution.
- (iii) Determination of Dissociation constant of a weak acid

II Distribution law

- (i) Distribution of Iodine between two immiscible solvents & Study of the equilibrium constant of the reaction $KI + I_2 \rightarrow KI_3$
- (ii) Distribution of benzoic acid between two immiscible solvents

III Thermometry

Determination of Solution enthalpy of

- (i) Benzoic acid-water
- (ii) Naphthalene-Toluene

IV Kinetics – Study of Kinetics of $KI - K_2S_2O_8$ system.

**Table - 5 : Common Course Structure for PG Degree Programme in Science -
M.Sc. (Computer Science)
(with effect from the academic year 2017-2018 onwards)**

Sem.	Sub. No.	Subject Status	Subject Title	Contact Hrs./ Week	Credits
(1)	(2)	(3)	(4)	(5)	(6)
I	1	Core - 1	Design and Analysis of Algorithms	5	4
	2	Core - 2	Advanced Java Programming	5	4
	3	Core - 3	Mathematical Foundation for Computer Science	4	4
	4	Core - 4	Object Oriented Systems Development	4	4
	5	Core - 5	Distributed Computing	4	4
	6	Core - 6 Practical - 1	Algorithm Lab Using C++	4	2
	7	Core - 7 Practical - 2	Advanced Java Lab	4	2
			Subtotal	30	24
II	8	Core - 8	Web Application Development	5	4
	9	Core - 9	Open Source Technology	5	4
	10	Core - 10	Advanced Data Base Management System	4	4
	11	Core - 11	Security in Computing	4	4
	12	Elective - 1	Data Mining, Multimedia Systems, Cloud Computing	4	3
	13	Core - 12 Practical - 3	Web Application Lab	4	2
	14	Core - 13 Practical - 4	Open Source Lab	4	2
			Subtotal	30	23

Sem.	Sub. No.	Subject Status	Subject Title	Contact Hrs./ Week	Credits
(1)	(2)	(3)	(4)	(5)	(6)
III	15	Core - 14	Digital Image Processing	4	4
	16	Core - 15	Soft Computing	4	4
	17	Core - 16	Software Testing	4	4
	18	Core - 17	Advanced Computer Networks	4	4
	19	Core - 18	Research Methodology	4	4
	20	Elective - 2	Principles of Compiler Design, Big Data Analytics, Mobile Computing	4	3
	21	Core - 19 Practical - 5	Image Processing Using MATLAB	4	2
	22	Core - 20	Mini Project	2+2*	2
	Subtotal				30
IV	23	Core - 21	Major Project	30+2*	16
	Subtotal				30
Total				120	90

* Extra hours for Project

For the Project, flexible credits are b/w 5 - 8 & Hours per week are b/w 10 - 16.

Total number of credits \geq 90 : 90

Total number of Core Courses : 21 (14 T + 5 P + 2 Prj.)

Total number of Elective Courses : 2

Total hours : 120

I SEMESTER

Core – 1
DESIGN AND ANALYSIS OF ALGORITHMS

Unit - I

Introduction : Algorithm-Specification-Performance Analysis. Elementary Data Structure : Stacks And Queues- Trees-Dictionaries-Priority Queues.

Unit - II

Divide And Conquer : General Method-Binary Search- Finding the Maximum And Minimum-Quicksort-Strassen's Matrix Multiplication.

Unit - III

The Greedy Method : General Method-Knapsack Problem-Job Sequencing with Deadlines-Minimum Cost Spanning Tree-Single Source Shortest Path.

Dynamic Programming : General Method-Multistage Graph-All Pairs Shortest Path-Binary Search Tree-0/1 Knapsack Travelling Salesperson Problem.

Unit - IV

Basic Traversal And Search Techniques : Techniques for Binary Trees-Graphs-Connected Components and Spanning Trees-Biconnected Components.

Backtracking : General Method-8-Queen. Graph Coloring : Hamiltonian Cycle.

Unit - V

Branch and Bound : Method-0/1 Knapsack Problem.

NP-Hard And NP-Complete Problem-Basic Concepts-Cook's Theorem- Clique Decision Problem-Job Shop Scheduling.

Text Book

1. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithms", 2nd Edition, Universities Press(India) Private Ltd., 2008

Reference Books

1. Aho, Hopcroft and Ullman, "The Design and Analysis of Computer Algorithm", Pearson Education, Delhi, 2001.

2. Basu S.K., "Design Methods and Analysis of Algorithms", PHI, 2006.

3. M.A.Weiss, "Data Structures and algorithm Analysis in C++", Pearson Education, Asia, 2013.

Core – 2
ADVANCED JAVA PROGRAMMING

Unit - I

Classes and Objects : Introduction-General form-Object creation-Constructor-Finalize()-Static member-Inner and Anonymous Inner classes; Inheritance and Polymorphism:- Introduction-Inheriting the variables in a class-Inheriting the methods in a class-Inheritance and Constructors-Abstract classes-Final classes-Interfaces and package-Exception Handling.

Unit - II

J2EE Multi-Tier Architecture : Distributive system-The Tier-J2EE Multi Tier Architecture-client-Tier Implementation-web tier Implementation-Enterprise Java Bean tier implementation-Enterprise information system tier implementation; J2EE Best practices:- Enterprise Application strategy-The Enterprise Application-Client Session management-Web Tier and Java Server Pages-Enterprise JavaBean Tier.

Unit - III

JDBC Objects : The concept of JDBC-JDBC drivers-JDBC packages-A brief overview of the JDBC process-database connection-Associating JDBC/ODBC bridge with the database statement objects-Result set-Transaction processing-Metadata; JDBC and Embedded SQL:- Tables-Indexing-Inserting into tables- Selecting data from tables-Joining tables-Calculating data-Grouping and ordering data-subqueries.

Unit - IV

Java Servlets : Java Servlets and Common Gateway Interface Programming-A Simple java Servlet-Anatomy of Java Servlet-Reading Data from a Client-Reading Http Request Headers-Sending Data to Client and Writing the Http Response Headers- Working with Cookies-Tracking Sessions; Java Server Pages:-JSP-JSP Tags Tomcat-Request String-User Sessions Cookies-Session objects.

Unit - V

Enterprise Java Bean:-Enterprise Java Beans-Deployment Descriptors-Session Java Bean-Entity Java Bean- Message Driven Bean-The JAR File; Java Interface Definition Language and CORBA:-The Concept of object RequestBrokerage- Java IDL and CORBA- The IDL Interface-The Client Side the Server Side-Running the Code.

Text Book

1. C.Muthu,"Programming with Java",SecondEdition,VNI, 2008.
2. Jim Keogh,"TheComplete Reference J2EE",TMH, 2004 (Reprint)

References

1. Herbert Schildt, "The Complete Reference Java", Seventh Edition, TMH, 2007.
2. Joseph O'Neil, "JavaBeans Programming", TMH, 1998.

Core -3

MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE

Unit - I

Mathematical Logic: Introduction-Statements and Notation-Connectives-Normal Forms-The Theory of Inference for the Statement calculus-The Predicate Calculus-Inference theory of the Predicate Calculus

Unit - II

Set Theory: Introduction- Basic concepts of Set theory-Relations-Functions.

Unit - III

Matrices: Rank of Matrix, Solving System of Equations, Eigen values and Eigen Vectors-Inverse of matrix- Cayley Hamilton Theorem.

Unit - IV

Graph Theory: Introduction-Graphs-Application of Graphs-Finite and Infinite Graphs-Incidence and Degree-Isolated Vertex, Pendant Vertex and Null Graph

Paths and Circuits: Isomorphism- Subgraphs - Walks, Paths and Circuits-Connected and Disconnected graphs-Components-Euler Graphs-Operation on Graphs-Hamiltonian paths and circuits-Travelling Salesman Problem

Unit - V

Trees and Fundamental Circuits: Properties of Trees-Pendant vertices in trees-Distance and centers in a Tree-Rooted and Binary Tree-Spanning Tree-Fundamental circuits—Spanning Tree in the Weighted Graph.

Matrix Representation of Graphs: Incidence Matrix-Submatrices-Circuit Matrix-Path matrix-Adjacency Matrix

References

1. J.P. Trembley and R.Manokar, “Discrete Mathematical Structures with Applications to Computer Science”,Tata McGraw Hill Publications, 2009.
2. Narasingh Deo, “Graph Theory With Applications To Engineering And Computer Science”, Prentice-Hall of India Private Limited, 2007.
3. Kenneth H.Rosen, “Discrete Mathematics and its Applications”, Tata McGraw Hill, 4th edition, 2002.

Core – 4
OBJECT ORIENTED SYSTEMS DEVELOPMENT

Unit - I

Overview of Object Oriented Systems Development : Introduction – Two orthogonal views- Development methodology- Object orientation.

Object basics: Introduction-Object Oriented Philosophy- Object – Attributes – Object respond to messages – Encapsulation – Inheritance – Polymorphism – Object relationship and associations. OOSD life cycle : Introduction – Software development process – OOSD Use case Driven Approach – Reusability.

Unit - II

Object Oriented Methodology – Rumbaugh etal’s methodology- Booch methodology – Jacobson methodology – Pattern. Unified Modeling Language - Introduction – static dynamic model – UML diagrams – UML class diagrams – Use case- UML dynamic modeling – packages and model organization.

Unit - III

Object Oriented Analysis : Introduction – Business Object Analysis, Use case driven object oriented analysis – Effective documentation. Classification : Introduction – Classification theory – Naming classes. Identifying object relationships, attributes, methods : Association – Super sub class relationship – Aggregation.

Unit - IV

OOD process and design axioms : Introduction – OOD process- Design axioms – Corollaries – Design pattern. Designing classes : Introduction – Designing classes process – Class visibility – Refining attributes – Designing methods and protocols – Packages and managing classes. Access layer: Introduction - Object Store and persistence – DBMS – Logical and physical Database Management System – Distributed Databases and Client Server Computing – Next generation of client Server Computing – Multidata base System – Design Access layer classes

Unit - V

Software Quality Assurance : Introduction – Quality Assurance Tests – Object Orientation on Testing – Testing strategies – Test Cases- Test Plan.

System Usability and Measuring User satisfaction : Introduction – Usability Testing.

Text Book

1. Ali Bahrami, “Object Oriented Systems Development using UML”, Tata McGraw-Hill Education Private Limited, 2008

References

1. Brahma Dathan, Sarnath Ramnath, “Object Oriented Analysis, Design and Implementation”, Universities Press, 2010.

2. Mahesh P.Matha, “Object-Oriented Analysis and Design Using UML”, PHI Learning Private Limited, 2012.

Core - 5
DISTRIBUTED COMPUTING

Unit - I

Fundamentals: What is Distributed Operating System – Evolution of Distributed Computing System – Distributed Computing System Models – Why are Distributed Computing Systems gaining popularity – What is a Distributed Computing System – Issues in Designing Distributed Computing System – Introduction to Distributed Computing Environment.

Introduction to Computer Networks – Network types – LAN – WAN – Communication protocols – Internetworking – ATM Technology

Unit - II

Message Passing: Introduction Desirable features – Issues in PC Message Passing – Synchronization – Buffering – Multidatagram Messages – Encoding and Decoding – Process Addressing – Failure Handling – Group Communication

Unit - III

Remote Procedure Calls : RPC models – Transparency of RPC–Stub generation–RPC messages–Marshaling arguments and results–Exception Handling–Light weight RPC; Distributed Shared Memory: Introduction – General Architecture of DSM system – Design and Implementation Issues of DSM – Granularity – Structure of Shared Memory – Consistency Models – Replacement Strategy – Thrashing.

Unit - IV

Synchronization: Introduction – Clock Synchronization – Event Ordering – Mutual Exclusion – Deadlock – Election Algorithm–Process Management: Introduction–Process Migration–Threads.

Unit - V

Distributed File System: Introduction – Desirable features – File Models – File Accessing Models – File Sharing Semantics – File Caching Schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles.

Text Book

1. Pradeep K Sinha, “Distributed Operating Systems – Concepts and Design”, PHI, 2003

References

1. Andrew S Tanenbaum , “Distributed Operating Systems”, First Edition, PHI, 2002
2. Abraham Silberchalz Peter B. Galvin, G.Gagne, “Operating Systems Concepts”, Seventh edition, Addison Wesley Publishing Co., 2010.
3. Pabitra Pal Choudhury, “Operating Systems : Principles and Design”, PHI, 2009.

Core – 6
ALGORITHM LAB USING C++

Programs should include but not limited to:

1. Write a program that implements Stack
2. Write a program to implement Queue
3. Write a program that implements Priority Queue
4. Write a program that implements Binary Search
5. Write a program that implements Quick Sort
6. Write a program that implements Strassen's matrix multiplication
7. Write a program that implements Prim's Algorithm
8. Write a program that implements Kruskal's Algorithm
9. Write a program that implements All pair shortest path problem
10. Write a program that implements N-Queen Problem
11. Write a program that implements BFS
12. Write a program that implements DFS
13. Write a program that implements Travelling Salesperson Problem
14. Write a program that implements knapsack using greedy

Core – 7
ADVANCED JAVA LAB

Programs should include but not limited to:

1. Write a java code to demonstrate class with constructors
2. Write a java code to demonstrate Inheritance
3. Write a java code to demonstrate Interface
4. Write a java code to demonstrate packages
5. Write a java code to demonstrate Custom Exception
6. Write a java code to create a connection to access database from hard disk using domain server name and display a message SUCCESSFULLY CONNECTED, if the connection is created.
7. Write a java code to fetch the table information using JDBC.
8. Write a java code to update a particular record using JDBC.
9. Create a servlet and display a message using hyperlink .
10. Write a servlet code to change the Explorer background color
11. Write a HTML code to capture the user Input name and E-mail ID and display the information in the next form using JSP
12. Write a simple JSP code to create a form and validate a password
13. Write a java servlet to get information in the first form and display in second form

Core – 8

WEB APPLICATION DEVELOPMENT

Unit - I

ASP.NET Introduction : .NET Programming Framework, , The Common language runtime and .NET Class Library, Features of ASP.NET and Visual studio .NET.

.NET language : Data types - declaring variables - Scope and accessibility - Variable Operators & Operations - Type conversions - Object based manipulations - Conditional and Loop structures - Functions and subroutines.

Types, Objects and Namespaces : Class – object - constructor - Value types and Reference types. Advanced class programming : Inheritance – polymorphism – Interfaces - Exception handling - Multithreading. Understanding namespaces.

Unit - II

ASP.NET Applications – File types, Simple Application from start to finish. Code behind compilation - Global .aspx application files, ASP.Net configuration.

Web Form fundamentals : Simple page applet- server controls - Deeper look in HTML controls - page classes

Web control classes : Auto postback and web control event- Generating Automatic greeting card.

Unit - III

Validation and Rich Controls : Calendar and Ad Rotator control - Validation Controls – Simple validation example – Regular expression concepts- Customer form validation.

State management : view state - custom cookies - Session state - Session state configuration - Application state.

Unit - IV

ASP.NET Intrinsic Objects : HTTP Request Object, HTTP Response Object, HTTP ServerUtility Object, ObjectContext Object

Data Access with ADO.NET : Overview of ADO.NET Objects - Characteristics of ADO.NET - ADO.NET object model.

ADO.NET data access : SQL basics – select, update, insert, delete statements. Accessing data - Creating a connection – Defining select statement - Using command with data reader - Updating data. Accessing disconnected data.

Unit - V

Comparing the template control : The Data list - The Data grid - The Repeater - Selecting Items - Editing Items - Paging with Data Grid - Sorting with Data grid.

Web Server and IIS manager, Web services Architecture : The Open Standards Plumbing - WSDL- SOAP- UDDI. Communicating with web service.

Text Book

1 Mathew Mac Donald, “ASP.NET Complete Reference”, TMH 2005.

References

1. Crouch Matt J, “ASP.NET and VB.NET Web Programming”, Addison Wesley 2002.
2. J.Liberty, D.Hurwitz, “Programming ASP.NET”, Third Edition, O’REILLY, 2006.

Core – 9

OPEN SOURCE TECHNOLOGY

Unit - I

Getting started – Introduction to UNIX, Linux GNU – Programming Linux.

Shell Programming – Basics – Pipes and Redirection – The Shell as a Programming Language – Shell syntax.

Working with files – Linux File Structure –Low level File Access – The Standard I/O Library.

Unit - II

Working with files – Formatted Input and Output – File and Directory Maintenance – Scanning Directories – Errors.

The Linux Environment – Program Arguments – Environment Variables – Time and Date – Temporary Files – User Information – Host Information.

Terminals- Reading from and writing to the terminal.

Unit - III

Why PHP & MySQL – What is PHP? – What is MySQL?

Server-side Web Scripting – Static HTML – Client-side Technologies – Server-Side Scripting

Syntax and Variables – Comments – Variables – Simple types – outputs.

Control and Functions – Boolean expressions – Branching – Looping – Terminating execution – Using functions – Defining your own function – Functions and variable scope.

Unit - IV

Passing information between Pages – GET Arguments – POST Arguments – Formatting Form Variables – PHP super global arrays.

String – Strings in PHP – String Functions.

Arrays and Array Functions – Creating Arrays – Retrieving Values – Multidimensional Arrays – Deleting from Arrays

Numbers – Numerical Types – Mathematical Operators – Simple Mathematical Functions.

Unit - V

PHP/MySQL Functions – Connecting to MySQL – Making MySQL Queries – Fetching Data Sets – Multiple Connections – Error Checking – Creating MySQL Databases with PHP – MySQL Functions.

Displaying Queries in Tables - HTML Tables and Database Tables – Creating the Sample Tables.

Building Forms from Queries – HTML Forms - Basic Form Submission to a Database – Self Submission – Editing Data with an HTML Form.

Textbooks

- 1) Neil Matthew and Richard Stones “Beginning Linux Programming”, 4/e; New Delhi: Wiley-India, 2009.
- 2) Tim Converse and Joyce Park with Clark Morgon, “PHP 5 and MySQL Bible”; New Delhi: Wiley-India, 2008.

References

1. M.N.Rao, “Fundamentals of Open Source Software”, PHI, 2015.
2. Kailash Vadera and Bhavyesh Gandhi, “Open Source Technology”, Laxmi Publications, First Edition 2009.
3. Narain Gehani, “The Database Application Book Using the MYSQL Database System”, University Press, 2012.

Core – 10

ADVANCED DATA BASE MANAGEMENT SYSTEM

Unit - I

Introduction to Relational Model : Structure of Relational Databases- Database Schema – Keys – Schema Diagrams – Relational Query Language – Relational Operations.

Formal Relational Query Languages : The Relational Algebra – The Tuple relational Calculus – The Domain Relational Calculus.

Unit - II

Database Design and the E-R Model : Overview – The Entity-Relationship model – Constraints – Removing Redundant Attributes in Entity Sets – Entity Relationship Diagrams- Reduction to relational schemas – Entity Relationship Design Issues – Extended E-R Features.

Relational Database Design : Features of good relational Design – Atomic Domains and First Normal Forms – Decomposition Using Functional Dependencies.

Unit - III

Indexing and Hashing : Basic Concepts – Ordered Indices – B⁺ Tree Index Files – B⁺ Tree Extensions – Multiple Key Access – Static Hashing – Dynamic Hashing – Comparison of Ordered Indexing and Hashing – Bitmap Indices .

Transactions : Transaction Concept – A simple Transaction model – Storage Structure – Transaction Atomicity and Durability – Transaction Isolation – Serializability.

Unit - IV

Concurrency Control : Lock based Protocols – Deadlock Handling – Multiple Granularity – Timestamp Based Protocols – Validation Based Protocols – Multiversion Schemes – Snapshot Isolation – Insert Operations, Delete Operations and Predicate Reads.

Recovery Systems : Failure Classification – Storage – Recovery and Atomicity – Recovery Algorithm – Buffer Management.

Unit - V

Database System Architecture : Centralized and Client Server Architectures – Server System Architectures – Parallel Systems – Distributed Systems.

Parallel Databases : Introduction – I/O parallelism – Interquery parallelism – Intraquery parallelism – Intraoperation parallelism – Interoperation parallelism – Query Optimization.

Distributed Databases : Homogeneous and Heterogeneous Databases – Distributed Data Storage – Distributed Transactions.

Textbook

1. Abraham Silberschatz, Henry F. Korth and S.Sudarshan, “Database System Concepts”, Sixth Edition, McGrawHill International Edition, 2011.

References

1. Ramez Elmashree, Shamkant B.Navathe, “Fundamentals of Database Systems”, Pearson Education, 2011.

2. C.J.Date, “Introduction to Database Systems”, 8th Edition, Pearson Education, 2003.

3. Rajesh Narang, “Database Management Systems”, 2nd Edition, PHI, 2012.

Core – 11

SECURITY IN COMPUTING

Unit – I

Cryptography : Terminology and Background – Substitution ciphers - The Caesar cipher, The Vernam cipher, Book cipher; Transposition ciphers.

DES – AES - Public key encryption - RSA encryption - Possible attacks on RSA-Uses of Encryption

Unit – II

Program Security : Secure programs – Fixing faults, Unexpected behavior, Types of flaws; Nonmalicious Program errors

Virus and other malicious code – Kinds of malicious code, How Viruses attach, Document viruses, How viruses gain control, Homes for viruses, Virus Signatures, The source of Viruses, Prevention of Virus Infection.

Targeted malicious code – Trojans, Trapdoors, Salami Attack.

Unit – III

Security in Databases : Security Requirements - Integrity of the database, Element Integrity, Audibility, Access control, User authentication, Availability, SQL injection; Reliability and Integrity – Protection features from the operating system, Two-phase update, Redundancy/Internal consistency, Recovery, Concurrency/Consistency, Monitors; Sensitive data - Access decisions, Types of disclosures, Security versus Precision; Inference – Direct Attack , Indirect Attack; Multilevel databases – Granularity , Security Issues.

Unit – IV

Security in Networks : Threats in Networks – What makes a network vulnerable? Categories of attack, Who attacks Networks?

Network Security Controls – Security Threat analysis, Effect of security in architecture of network, Encryption, Content integrity, Strong authentication, Access controls, Wireless security, Alarms and alerts, Honey pots, Traffic flow security.

Firewalls – Design of firewalls, Types of Firewalls, Personal Firewalls, Comparison of Firewall Types.

Unit – V

Legal and Ethical Issues in Computer Security : Protecting Programs and data – Information and the law - Redress for software failures – Selling correct software, Reporting software flaws.

Computer Crime : Why a separate category for computer crime is needed, Why computer crime is hard to define, Why computer crime is hard to prosecute, Indian Cyber law offences, Cyber Pornography, Accessing Protected System, Tampering with Computer Source code.

Ethical Issues in Computer Security : Differences between the Law and the Ethics, Studying Ethics, Ethical Reasoning.

Text Book

1. Charles P. Pfleeger, Shari Lawrence Pfleeger, “Security in Computing”, Fourth Edition, Pearson Education, 2007.

References

1. Michael Whitman, Herbert J. Mattord, “Management of Information Security”, Third Edition, Course Technology, 2010.

2. William Stallings, “Cryptography and Network Security:Principles and Practices”, Fifth Edition. PHI, 2010.

3. V.K.Pachghare, “Cryptography and Information Security”, PHI, 2013.

Elective - I
1. DATA MINING

Unit - I

Introduction : Basic Data Mining Tasks - Data Mining Versus Knowledge Discovery in Databases - Data Mining Issues - Data Mining Metrics - Social Implication of Data Mining - Data Mining from a Database Perspective

Data Mining Techniques : A Statistical Perspective on Data Mining - Similarity Measures - Decision Trees - Neural Networks - Genetic Algorithms

Unit - II

Classification : Introduction – Statistical - Based Algorithms - Distance-Based Algorithms - Decision Tree-Based Algorithms - Neural Network - Based Algorithms - Rule-Based Algorithms - Combining Techniques.

Unit - III

Clustering : Introduction - Similarity and Distance Measures - Outliers - Hierarchical Algorithms - Partitional Algorithms - Clustering Large Databases - Clustering with Categorical Attributes.

Unit - IV

Association Rules : Introduction - Large Itemsets - Basic Algorithms - Parallel and Distributed Algorithms - Comparing Approaches - Incremental rules - Advanced Association Rule Techniques - Measuring the Quality of Rules

Unit - V

Web Mining : Introduction - Web content Mining - Web Structure Mining - Web Usage Mining. Spatial Mining : Introduction - Spatial Data Overview - Spatial Data Mining Primitives -Generalization and Specialization - Spatial rules - Spatial Classification Algorithms - Spatial Clustering Algorithms

Text Book

1.Marget H.Dunham, “Data Mining Introductory and Advanced Concepts”,Pearson Education 2003.

References

1. G.K.Gupta, “Introduction to Data Mining with Case Studies”, 3rd Edition, PHI,2015.
2. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, “Introduction to Data Mining”, Pearson Education, 2007.
3. Jiawei Han and Micheline Kambar, “Data Mining Concepts and Techniques”, Second Edition, Elsevier, Reprinted 2008.

Elective - I

2. MULTIMEDIA SYSTEMS

Unit - I

Uses of Multimedia Information : Defining the scope of multimedia, Hypertext and Collaborative research, Multimedia and personalized computing, Multimedia on the map, Emerging applications, The challenges.

The convergence of computers, Communications, and entertainment products: The technology trends, Multimedia appliances, Hybrid Devices, Designers perspective, industry perspective of the future, Key challenges ahead, Technical, regulatory, Social.

Architectures and issues for Distributed Multimedia systems: Distributed Multimedia systems, Synchronization, and QOS Architecture, The role of Standards, A frame work for Multimedia systems

Unit - II

Digital Audio Representation and processing : Uses of Audio in Computer Applications, Psychoacoustics, Digital representation of sound, transmission of digital sound, Digital Audio signal processing, Digital music making, Speech recognition and generation, digital audio and the computers.

Video Technology : Raster Scanning Principles, Sensors for TV Cameras, Colour Fundamentals, Colour Video, Video performance Measurements, Analog video Artifacts, video equipments, Worldwide television standards.

Digital Video and Image Compression : Video compression techniques, standardization of Algorithm, The JPEG Image Compression Standard, ITU-T Recommendations, The EPEG Motion Video Compression Standard, DVI Technology

Unit - III

Operating System Support for Continuous Media Applications : Limitation of Work station Operating system, New OS support, Experiments Using Real Time Mach.

Middleware System Services Architecture : Goals of Multimedia System services, Multimedia system services Architecture, Media stream protocol.

Multimedia Devices, Presentation Services, and the User Interface : Client control of continuous multimedia, Device control, Temporal coordination and composition, toolkits, hyper applications.

Multimedia File systems and Information Models : The case for multimedia information systems, The file system support for continuous Media, Data models for multimedia and Hypermedia information, Content- based Retrieval of Unstructured Data.

Multimedia presentation and Authoring : Design paradigms and User interface, barriers to wide spread use, research trends.

Unit - IV

Multimedia Services over the Public Networks: Requirements, Architecture, and protocols, Net work services, applications.

Multimedia Interchange : Quick time Movie File Format, QMFI, MHEG (Multimedia and Hypermedia Information Encoding Expert Group), Format Function and representation, Track model and Object model, Real Time Interchange.

Multimedia conferencing : Teleconferencing Systems, Requirements of Multimedia Communications, Shared Application Architecture and embedded Distributed objects, Multimedia Conferencing Architecture.

Unit - V

High Definition Television and desktop computing : Video versus Computing-Viewing Conditions-Quality-HDTV,ATV,EDTV,IDTV-HDTV Standards – Standardization Issues HDTV standards.

Knowledge based Multimedia systems - Anatomy of an Intelligent Multimedia system

Text Book

John F.Koegel Buford, “Multimedia Systems”, Pearson Education, 2012

References

- 1.Tay Vaughan, “Multimedia – Making it work”, Fifth Edition, TMH 2003
- 2.Ralf Steinmetz and Klara Nahrstedt, “Multimedia:Computing , Communication and Application”, Pearson Education, 2009

Elective - I

3. CLOUD COMPUTING

Unit – I

Cloud computing – An Overview : Introduction – History of cloud computing – Characteristics of cloud – Cloud computing model – Advantages and disadvantages of cloud computing – Security, Privacy and trust – Virtualization – Next generation of cloud computing.

Cloud computing Architecture : Introduction - Cloud Architecture – Cloud computing models – Deployment models – Identity as a service.

Unit – II

Virtualization in Cloud : Virtualization – Implementation of Virtualization - Virtualization support at the OS level – Advantages of Virtualization – Application Virtualization - Virtualization implementation techniques – Hardware virtualization – Types of Virtualization – Logical cloud computing model – Virtualization for Data-centre.

Security Issues and challenges in Cloud computing : Introduction - Security challenges in Cloud computing – Information Security in Cloud computing – Security, Privacy and Trust.

Security Management : Introduction – Security in reference architecture – Security Issues in cloud computing – Classification of security issues – Types of attackers – Security risk in

cloud computing – Security Threats against cloud computing – Emerging trends in security and privacy.

Unit - III

Virtualization System specific Attacks : Attacks in cloud computing environment – Attacks in Hypervisor – Security challenges – Desktop virtualization Security – Planning and deployment for secure virtualization.

Web Services : Amazon web services – Microsoft Azure – Google App Engine

Unit – IV

Service Oriented Architecture : SOA components – Design principles of SOA – SOA requirements – Benefits of SOA – Significance of SOA in cloud computing – Enterprise Service Bus – Web Services – Recurring Architectural Capabilities.

Migrating Applications to the Cloud computing : Motivations for migration – Issues in migrating the applications to the cloud – Types of migration – Planning for migrating the application to the cloud – Migration Roadmap. Cloud Computing Applications : Business applications – Finance and banking applications – Cloud computing in education.

Unit – V

Standards in Cloud Computing : Standardization activities – Challenges – Fields of standardization - Standardization organizations in Cloud Computing. Mobile Cloud Computing : Needs of mobile Cloud Computing – Mobile Cloud Computing Architecture – Technologies for MCC – MCC Applications – Challenges in building applications – Platforms.

Microservices : Need of microservices – Microservice architecture – Benefits of Microservices – Drawbacks of microservices – Communication mechanisms – Decentralized data management - Essential check - lists for migration from monolithic to microservices.

Text book

1. V.K.Pachghare, “Cloud Computing”, PHI, 2016.

References

1. Michael Miller, “Cloud Computing”, Pearson Education, New Delhi, 2009
2. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter, “Cloud Computing”, TMH, 2010
3. Kumar Saurbh , “Cloud Computing – Insights into New-Era Infrastructure”, Wiley India, 2011.
4. John W. Rittinghouse and James F. Ransome, “Cloud Computing : Implementation, Management and Security”, CRC press, 2010.

Core – 12
WEB APPLICATION LAB

Programs should include but not limited to:

1. Change the background color using RGB()
2. Implement Currency Converter
3. Demonstrate Event Tracker
4. Write a program using file uploading control
5. Write a program to create a registration page using validation controls
6. Write a program using Session State and Application State variables
7. Write a program to demonstrate the use of Session.Timeout
8. Write a program using QueryString.
- 9 Write a program to create Cookies
10. Write a program using DataGrid and DataList controls
11. Write a program to search and store student data in MSAccess
12. Write a program to save customer information and generate electricity bill using MS Access

Core – 13
OPEN SOURCE LAB

Programs should include but not limited to:

1. Create a Relational Database in MySQL , insert values and execute queries using basic and advanced select commands.
2. Perform join operation on relational tables
3. Create Queries using aggregate functions
4. Create views of the database
5. Implement a PHP program to display a Welcome page based on client browser.
6. Implement a PHP program to process HTML forms.
7. Implement a PHP program to demonstrate Object Oriented Programming in PHP
8. Implement a PHP program to demonstrate database handing.
9. Write a PHP program to create a directory, and to read contents from the directory.
10. Execute the Linux commands:
 - a) ls, cat, chmod, find, sort, bc, cal, wc
 - b) pipe and filter
11. Write a C program to generate Fibonacci series and execute in Linux OS
12. Write a shell program to check whether the given number is Armstrong or not.
13. Write a shell program to generate pay slip of an employee.

Table – 6: Course Structure for **M.Sc. (Maths) Degree Programme**

(with effect from the academic year 2017-2018 onwards)

Sem.	Sub. No.	Subject Status	Subject Title	Contact Hrs./ Week	Credits
(1)	(2)	(3)	(4)	(5)	(6)
I	1	Core - 1	Algebra - I	6	4
	2	Core - 2	Analysis – I	6	4
	3	Core - 3	Analytic Number Theory	6	4
	4	Core - 4	Ordinary Differential Equations	6	4
	5	Core - 5	Numerical Analysis	6	4
	Subtotal				30
II	6	Core - 6	Algebra II	5	4
	7	Core - 7	Analysis II	5	4
	8	Core - 8	Classical Mechanics	5	4
	9	Core - 9	Differential Geometry	5	4
	10	Core - 10	Graph Theory	5	4
	11	Elective - 1	1) Programming With C++ 2) Discrete Mathematics 3) Partial Differential Equations	5	3
	Subtotal				30

III	12	Core - 11		5	4	
	13	Core - 12		5	4	
	14	Core - 13		5	4	
	15	Core - 14		5	4	
	16	Core - 15	Research Methodology	5	4	
	17	Elective - 2		5	3	
				Subtotal	30	23
IV	18	Core - 16		6	4	
	19	Core - 17		6	4	
	20	Core - 18		5	4	
	21	Core - 19		5	4	
	22	Core - 20	Project	8	8	
				Subtotal	30	24
				Total	120	90

For the Project, flexible credits are b/w 5 – 8 & Hours per week are b/w 10 - 16.

Total number of credits \geq 90	:	90
Total number of Core Courses	:	20 (19 T + 1 Prj.)
Total number of Elective Courses	:	2
Total hours	:	120

SEMESTER I

1.1 Paper 1: ALGEBRA - I

Text Book: Topics in Algebra , I.N. Herstein, 2nd Edition, Wiley India Edition.

Unit I: A Counting Principle – Normal Subgroups and quotient groups – Homomorphisms.

Sections: 2.5, 2.6, 2.7.

Unit II: Automorphisms – Cayley’s theorem – Solvable groups.

Sections: 2.8, 2.9.

Supplementary Problems : 10 -17.

Unit III: Permutation groups – Another counting principle.

Sections: 2.10, 2.11.

Unit IV: Sylow’s theorems.

Sections: 2.12.

Unit V: Direct products – Finite abelian groups.

Sections: 2.13, 2.14.

1.2 Paper 2: ANALYSIS – I

Text Book: Principles of Mathematical Analysis, Walter Rudin, Third Edition, McGraw Hill International Book Company .

Unit I: Metric spaces – Compact sets – Perfect sets – Cantor sets – Connected sets .

Chapter II : Sections 2.15 to 2.47.

Exercise Problems: Chapter II : 5 -14, 20.

Unit II: Convergence sequences – Sub sequences – Cauchy sequence - Lower and Upper limits – Some special sequences – Series – Series of non negative terms – The number e.

Chapter III : Sections 3.1 to 3.32.

Exercise Problems: Chapter III : 1 - 8.

Unit III: Root test and Ratio test – Power series – Summation by parts – Absolute convergence – Addition and multiplication of series.

Chapter III : Sections 3.33 to 3.51.

Exercise Problems : Chapter III : 9, 11 - 13.

Unit IV: Continuity – Limit of functions – Continuous functions – Continuity and compactness – Continuity and connectedness – Discontinuous – Monotonic functions.

Chapter IV : Sections 4.1 to 4.31.

Exercise Problems : Chapter IV: 1 – 5, 14,15.

Unit V: Differentiation – Derivative of a real function – Mean value theorems – The continuity of derivatives – L'Hospital Rule – Derivatives of higher order – Taylor's theorem.

Chapter V : Sections 5.1 to 5.15.

Exercise Problems : Chapter V : 1 - 5 and 12.

1.3 Paper 3: ANALYTIC NUMBER THEORY

Text Book: Introduction to Analytic Number Theory – Tom M. Apostol – Springer
International Student Edition.

Unit I: The fundamental Theorem of Arithmetic.

Chapter 1 and Exercise Problems: 1-11.

Unit II: Arithmetic functions.

Chapter 2: Sections 2.1 -2.8.

Exercise problems: Chapter 2: (1-6).

Unit III: Multiplicative functions and Dirichlet Multiplication.

Sections 2.9 – 2.14.

Exercise problems: Chapter 2: (21-23, 25,26).

Unit IV: Averages of Arithmetical functions.

Chapter 3: (1-9).

Exercise problems: Chapter 3: (1-4).

Unit V: Partial sums of Dirichlet product, Chebyshev's functions – equivalent forms of prime number theorem.

Chapter 3: Sections: 3.10, 3.11 and **Chapter 4:** 4.1 – 4.5.

Exercise problems: Chapter 4: (3,4,5,8,9,10).

1.4 Paper 4: ORDINARY DIFFERENTIAL EQUATIONS

Text Book: Differential Equations with application and historical notes, G.F. Simmons, Second Edition, Tata McGraw Hill.

Unit I: **Second Order linear equations :** General solution of the Homogeneous equations – The use of a known solution to find another – The method of variation of parameters.

Sections: 14 – 16.

Unit II: **Power series solutions:** A review of power series solutions – Series solution of first order equations – Second order equations – Ordinary points.

Sections: 26 – 28.

Unit III: Regular singular points – Legendre polynomials- Properties of Legendre polynomials

Sections: 29, 30, 44, 45.

Unit IV: Bessel functions – The Gamma functions – Properties of Bessel functions.

Sections: 46, 47.

Unit V: **Linear systems :** Homogeneous linear systems with constant coefficients

Sections: 55, 56.

1.5 Paper 5: NUMERICAL ANALYSIS

Text Book: Numerical Methods, S. Arumugam and others, Scikech(2001).

Unit I: Interpolation : Newton's Interpolation Formula – Central difference Interpolation
Lagrange's Interpolation formula – Divided differences - Newton's Divided
differences formula – Inverse Interpolation – Hermit's Interpolating Polynomial.

Chapter 7: Sections 7.1 to 7.7.

Unit II: Numerical differentiation – Derivatives using Newton's forward, backward,
central difference formulae

Chapter 8: Sections 8.1 to 8.3.

Unit III: Numerical Integration –Gaussian Quadrature formula –Numerical evaluation of
double integrals.

Chapter 8: Sections 8.5 to 8.7.

Unit IV: Numerical solutions of ordinary differential equations – Taylor's series Method –
Picard's Method – Euler's Method – Runge Kutta Method.

Chapter 10: Sections 10.1 to 10.4.

Unit V: Predictor corrector Method – Milnes Method – Adams-Bashforth Method.

Chapter 10: Sections 10.5 to 10.7.

SEMESTER II

2.1 Paper 6: ALGEBRA II

Text book 1: Topics in Algebra, I.N. Herstein, 2nd edition, Wiley Student edition.

Text book 2: A First Course in Rings and Ideals, David M. Burton, Addison – Wesley Publishing Company.

Unit I: Ring Homomorphisms – Ideals and Quotient rings – More ideals and Quotient rings – The field of Quotients of an integral domain.

Text book 1: **Sections:** 3.3 – 3.6.

Unit II: Euclidean rings - A particular Euclidean ring.

Text book 1: **Sections:** 3.7 and 3.8.

Unit III: Polynomial rings – Polynomials over rational field – Polynomial rings over commutative rings.

Text book 1: **Sections:** 3.9 – 3.11.

Unit IV: Certain radicals of a ring – Jacobson radical of a ring – Semi simple ring – nil radical – Primary ring.

Text book 2: **Chapter 8:** Definition 8.1 – Theorem 8.15.

Unit V: Quasi regular – J-semi simple – Direct sum of rings.

Text book 2: **Chapter 8:** Theorem 8.16 – Theorem 8.18 and **Chapter 10.**

2.2 Paper 7: ANALYSIS II

Text Book: **Principles of Mathematical Analysis**, Third Edition, Walter Rudin – McGraw Hill International Book Company.

Unit I: Definition and Properties of Integral – Integration and Differentiation.

Chapter 6: Section: 6.1 – 6.22.

Exercise Problems: Chapter 6: 1, 2, 4, 5, 10, 11.

Unit II: Integration of vector valued functions – Rectifiable arcs, Sequence and Series of functions: Discussion of main problem – Uniform Convergence – Uniform Convergence and Continuity.

Chapter 6: Section: 6.23 – 6.27 & **Chapter 7 :** Section: 7.1 – 7.15.

Exercise Problems: Chapter 7 : 1, 4, 6 and 7.

Unit III: Uniform Convergence and Integration – Uniform Convergence and Differentiation – Equicontinuous families of functions.

Chapter 7: Section: 7.16 – 7.25.

Unit IV: The Stone Weierstrass Theorem - Power Series.

Chapter 7: Section: 7.26– 7.33 and **Chapter 8:** Section: 8.1 – 8.5.

Exercise Problems: Chapter 8: 1 – 5.

Unit V: The algebraic completeness of the complex field – Fourier Series – The Gamma function.

Chapter 8: Section: 8.8 – 8.22

Exercise Problems: Chapter 8: 13, 14, 15.

2.3 Paper 8: CLASSICAL MECHANICS

Text Book: Classical Mechanics, H. Goldstein, second edition, Addison Wesley India edition.

Unit I: Mechanics of particle – Mechanics of a system of particles constraints.

Chapter 1: Section 1-3, Problems: 2, 4 and 5.

Unit II: D'Alembert's Principle and Lagrange's equation – Velocity dependent potentials and dissipation functions – Simple applications of Lagrangian formulation.

Chapter 1: Section 4, 5 and 6, Problems: 11, 13 and 17.

Unit III: Hamilton's Principle – Some techniques of Calculus of Variation – Derivation of Lagrange's equations from Hamilton's principle – Extension of Hamilton principle to non-holonomic systems.

Chapter 2: Section 1 - 4, Problems: 1 - 3.

Unit IV: Reduction to the equivalent one-body problem – The equations of motion and first Integrals – The equivalent one dimensional problem and classification of orbits - The virial theorem.

Chapter 3: Section 1 - 4, Problems: 2 - 4.

Unit V: The differential equation for the orbit and integrable power law potentials – The Kepler problem: Inverse square law of force – The motion in time in the Kepler problem – The Laplace – Runge – Lenz vector.

Chapter 3: Section 5, 7 - 9.

2.4 Paper 9: DIFFERENTIAL GEOMETRY

Text book: An Introduction to Differential Geometry, T.J. Willmore, Oxford University Press, (17th Impression), New Delhi, 2002, (Indian Print).

Unit I: The theory of space curves – Definitions , Arc length – Tangent – Normal and Binormal – Curvature and Torsion.

Chapter 1: Section: 1.1 – 1.5.

Problems: Chapter 1: Miscellaneous Exercise I: 1 – 3.

Unit II: Contact between curves and surfaces – Tangent Surface – Involutives and evolutes – Helices

Chapter 1: Section: 1.6, 1.7 and 1.9

Problems: Chapter 1: Miscellaneous Exercise I: 8 – 12.

Unit III: Definition of a surface – Curves on a surface – Helicoids – Metric – Direction Coefficients.

Chapter 2: Section: 2.1, 2.2, 2.4, 2.5, 2.6

Problems: Chapter 2: Miscellaneous Exercise II : 1 – 4.

Unit IV: Families of curves – Geodesics , Canonical geodesic equation, Normal Property of geodesics (Christoffel symbols not included).

Chapter 2: Section: 2.7, 2.10 – 2.12

Problems: Chapter 2: Miscellaneous Exercise II: 6, 7, 8.

Unit V: Geodesic curvature , The Second Fundamental form – Principal Curvature – Lines of Curvature (Dupin's indicatrix not included).

Chapter 2: Section: 2.15, **Chapter 3:** Section: 3.1 – 3.3.

Problems: Miscellaneous Exercise III: 1 – 5.

2.5 Paper 10: GRAPH THEORY

Text Book: Graph Theory with applications, H.J.A. Bondy and Murthy, The MacMillan Press Limited.

Unit I: Trees - Connectivity – Blocks.

Chapter 2: Section: 2.1 – 2.4. and Chapter 3: Section 3.1 – 3.3

Unit II: Euler tour – Hamilton cycle – Applications.

Chapter 4: Section: 4.1 – 4.3

Unit III: Matching – Perfect Matching – Edge colouring.

Chapter 5: Section: 5.1 – 5.3 & **Chapter 6 :** Sec : 6.1 & 6.2.

Unit IV: Independent sets – Cliques.

Chapter 7: Section: 7.1 – 7.3.

Unit V: Vertex Colouring.

Chapter 8: Section: 8.1 – 8.5.

2.6 Elective(Any One)

2.6.1 PROGRAMMING WITH C++

Text Book: Object oriented Programming with C++ (Fourth Edition), E.Balagurusamy, TMH Publications.

Unit I: Tokens, Expressions and Control Structures.

Chapter: 3

Programming Exercises: 3.1, 3.3, 3.5, 3.7, 3.9, 3.10

Unit II: Functions in C++, Classes & Objects.

Chapter: 4 & 5

Programming Exercises: 4.1, 4.2, 4.5, 4.7, 5.2, 5.5

Unit III: Constructors and destructors, Operator overloading & Type conversions.

Chapter: 6 & 7

Programming Exercises: 6.2, 7.2, 7.3, 7.4

Unit IV: Inheritance – Extending classes, Pointers, Virtual Functions & Polymorphism.

Chapter: 8 & 9

Programming Exercises: 9.1, 9.2

Unit V: Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators, Working with Files.

Chapter: 10.4, 10.5, 10.6, 11

Programming Exercises: 10.1, 10.3, 11.1, 11.2

2.6.2 DISCRETE MATHEMATICS

Text Book: Discrete Mathematics and its Applications (Sixth Edition) – Kenneth H. Rosen.
WCB/ McGraw Hill Publications

Unit I: Propositional Logic – Propositional equivalence - Predicates and quantifiers.

Sections: 1.1 - 1.3.

Problems: Section 1.1(1 - 38), Section 1.2(1 - 35) and
Section 1.3(1 – 34)

Unit II: The Basics of counting – The Pigeonhole principle – Generalized permutation and combination.

Sections: 5.1, 5.2 and 5.5

Problems: Section 5.1(1 - 40), Section 5.2(1 - 22) and
Section 5.5(1 – 9)

Unit III: Relation and their properties – n-ary relations and their applications – representing relation – closures of relations.

Sections: 7.1 – 7.4 except Warshall's algorithm

Problems: Section 7.1(All exercise problems), Section 7.2(1 - 27),
Section 7.3(1 – 22) and Section 7.4(1 - 22)

Unit IV: Boolean functions – Representing Boolean functions.

Sections: 10.1 and 10.2

Problems: All exercise problems.

Unit V: Logic Gates –Minimization.

Sections: 10.3 and 10.4

Problems: All exercise problems.

2.6.3 PARTIAL DIFFERENTIAL EQUATIONS

Text Book: Elements Of Partial Differential Equations, IAN N. SNEDDON, McGraw Hill, New Delhi, 1983.

Unit I: Methods of Solution of $\frac{dx}{P} + \frac{dy}{Q} + \frac{dz}{R}$ - Pfaffian Differential Forms and Equations
- Solution of Pfaffian Differential Equations in three variables .

Chapter 1: Section: 3, 5 and 6 (all problems)

Unit II : Partial Differential equations - Origins of first order Partial Differential equations - Linear equations of the first order - Integral surfaces passing through a given curve .

Chapter 2: Section: 1,2,4 and 5 (all problems)

Unit III: Cauchy's Method of Characteristics - Compatible systems of First order Equations - Charpit's Method.

Chapter 2: Section: 8 - 10 (all problems)

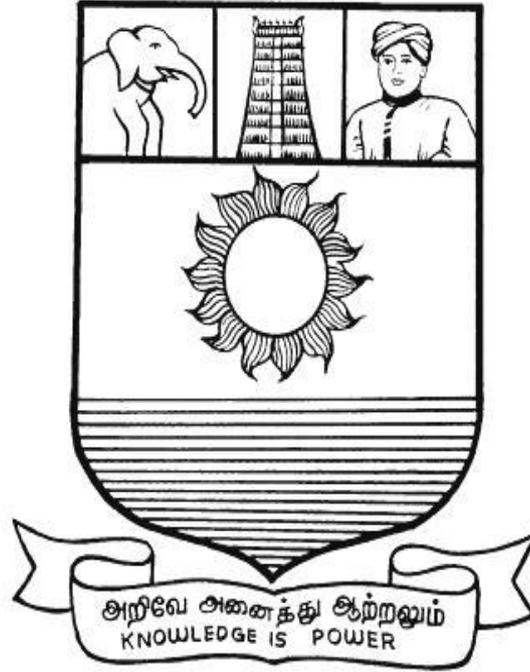
Unit IV: Second order equations in Physics - Linear Partial Differential equations with Constant Coefficients.

Chapter 3: Section: 2 and 4 (all problems)

Unit V: Characteristics of Equations in three variables - Separation of variables.

Chapter 3: Section: 7 and 9 (all problems)

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI – 12.**



BOARD OF STUDIES PG (IT)

(With effect from the academic year 2017-2018 onwards)

Manonmaniam Sundaranar University,

Tirunelveli – 12.

M.SC. NETWORK & INFORMATION TECHNOLOGY

(CBCS - For Colleges)

(2 years – 4 Semesters)

REGULATIONS

(Effective from the academic year 2017-2018 onwards)

1. Eligibility for Admission:

Candidates for admission to the first year of two year M.Sc. Networking and Information Technology shall be required to have passed any degree from a recognized University accepted by the Syndicate of this University.

2. Duration of the Course:

The course shall be extended for a period of two academic years consisting of four semesters with two semesters per year.

3. Passing Requirement:

The candidate will be declared to have passed in any subject (including practical and project viva voce) of study if he/she secures not less than 50 marks in the University end semesters examinations of their subjects.

4. Classification of successful candidates:

A candidate who qualifies for the degree with 60% or more shall be declared to have passed the examination in FIRST CLASS.

A candidate who qualifies for the degree with the 75% or more shall be declared to have passed the examination in FIRST CLASS with DISTINCTION.

All other successful candidates shall be declared to have passed in SECOND CLASS

5. Procedure in the Event of Failure :

If a candidate fails in a particular subject (other than project work) he/she may reappear for the University examination in that subject in subsequent semesters and obtain pass mark.

In the event of failure in project work, a candidate shall reregister for project work and redo the project work in the subsequent and resubmit the dissertation a fresh for evaluation.

6. General Conditions :

- (a) A candidate will be deemed to have completed the course of any semester only if he/she has secured not less 75% of attendance in the total number of working days of the concerned semester as a whole shall be followed. The usual procedures of condonation and repeat semester in vogue shall be followed for others.

Notes:

1. Each paper carries an internal component.
2. There is a pass minimum of 50% for external and overall components.
3. Theory Paper
Assessment Components (External:Internal =75:25)
4. Practical Paper
Assessment Components (External:Internal =50:50)
5. Internal Assessment
For theory course

Average of the best two test marks from three compulsory Test : 15 Marks.

Assignment	: 5 marks
Seminar	: 5 marks
Total	: 25 marks

For practical course

Experimental Work	: 20 marks
Record	: 15 Marks
Model Test	: 15 Marks
Total	: 50 Marks

Question Pattern – External Exam(Theory) :

- Part-A : 10 Multiple choice Questions (One mark each) - $10 \times 1 = 10$ Marks
(Note: Two Questions per unit)
- Part-B : 5 Questions (either – or type) – (5 marks each) - $5 \times 5 = 25$ Marks
(Note: One Questions per unit)
- Part-C : 5 Questions (either – or type) – (8 marks each) - $5 \times 8 = 40$ Marks

(Note: One Questions per unit)

- (b) Choice Based Credit System is followed for all the Courses. When a student completes the required credits prescribed for the course, Overall Percentage of Marks (OPM) will be calculated as follows. The marks obtained by the candidate (sum of external and internal marks) in a paper is multiplied by the credits assigned to the paper. Such weighted marks for all the papers are added and divided by the total credit.

Semester	Title of the Subject	Status	Contact Hrs./ Week	Credits	Maximum Marks			Passing Minimum	
					Internal	External	Total	External	Total
I	Data Communication and computer Networks	Core-1	5	4	25	75	100	38	50
	Object Oriented Programming using C++	Core-2	5	4	25	75	100	38	50
	Visual Programming	Core-3	4	4	25	75	100	38	50
	Software Engineering	Core-4	4	4	25	75	100	38	50
	E-Commerce	Core-5	4	4	25	75	100	38	50
	C++ Programming Lab	Core Practical-1	4	2	50	50	100	25	50
	Visual programming Lab	Core Practical-2	4	2	50	50	100	25	50
	Sub total	7 courses	30	24					

Semester	Title of the Subject	Status	Contact Hrs./ Week	Credits	Maximum Marks			Passing Minimum	
					Internal	External	Total	External	Total
II	Advanced Java Programming	Core-6	5	4	25	75	100	38	50
	RDBMS concepts and Oracle	Core-7	5	4	25	75	100	38	50
	Principles of Information Technology	Core-8	4	4	25	75	100	38	50
	Embedded Systems	Core-9	4	4	25	75	100	38	50
	Elective-1 (select any one from Elective –I group)	Elective-1	4	3	25	75	100	38	50
	Java programming Lab	Core Practical-3	4	2	50	50	100	25	50
	Oracle Lab	Core Practical-4	4	2	50	50	100	25	50
	Sub total	7 courses	30	23					

Semester	Title of the Subject	Status	Contact Hrs./ Week	Credits	Maximum Marks			Passing Minimum	
					Internal	External	Total	External	Total
III	Web Designing	Core-10	4	4	25	75	100	38	50
	Operating Systems	Core-11	4	4	25	75	100	38	50
	Network security and Cryptography	Core-12	4	4	25	75	100	38	50
	Software Testing	Core-13	4	4	25	75	100	38	50
	Research Methodology	Core-14	4	4	25	75	100	38	50
	Elective-2 (select any one from Elective – II group)	Elective -2	4	3	25	75	100	38	50
	Web Designing and Network Lab	Core Practical-5	4	2	50	50	100	25	50
	Mini Project	Core Project-1	2+2*	2	50	50	100	25	50
	Subtotal	8 courses	30	27					

Semester	Title of the Subject	Status	Contact Hrs./ Week	Credits	Maximum Marks			Passing Minimum	
					Internal	External	Total	External	Total
IV	Main Project Lab	Core Project-2	30+2*	16	50	50	100	25	50
	Subtotal	1 course	30	16					
Total		14T+5P+2Proj+2Elect.	120	90					

*Extra hours for Project

For the Project, flexible credits are b/w 5 – 8 & Hours per week are b/w 10 - 16.

Total number of credits ≥ 90 : 90

Total number of Core Courses : 21 (14 T + 5 P + 2 Prj.)

Total number of Elective Courses : 2

Total hours : 120

List of Electives offered:

Elective – I Group

(A) Management Information System

(B) Big Data analytics

Elective – II Group

(A) Data Warehousing and Mining

(B) Mobile Computing

SEM. I CORE PAPER-1 : DATA COMMUNICATION AND COMPUTER NETWORKS

Unit-I

Introduction : Data Communications – Networks – The Internet – Protocols and Standards.

Network Models : The OSI Model – Layers in the OSI Model. Physical Layer and Media :

Analog and Digital – Periodic Analog Signals – Digital Signals. Digital Transmission : Digital to

Digital Conversion – Analog to Digital Conversion . Transmission Media : Guided Media –

Unguided Media. Using Telephone and Cable Networks for Data Transmission : Telephone

Network – Digital Subscriber Line. (13L)

Unit-II

Data Link Layer : Error Detection and Correction : Introduction – Block Coding – Cyclic Codes

– Noisy Channels – HDLC. Multiple Access : Random Access. Wired LANs : Ethernet –

Standard Ethernet – Fast Ethernet – Gigabit Ethernet. (12L)

Unit-III

SONET/SDH : Architecture – Sonet Layers Virtual-Circuit Networks : Frame Relay and ATM – . Network Layer : IPv4 Address – IPv6 Address. **(13L)**

Unit-IV

Network Layer : Internet Protocol – Internetworking – IPv4 – IPv6. Network Layer :Address Mapping , Error Reporting and Multicasting – ICMP – IGMP. Network Layer : Delivery ,Forwarding, and Routing – Unicast Routing Protocols – Multicast Routing Protocols. **(10L)**

Unit-V

Process-to-Process Delivery: UDP, TCP – Process-to-Process Delivery – User Datagram Protocol(UDP) – TCP. Congestion Control and Quality of Service – Data Traffic – Congestion – Congestion Control – Quality of Service – Techniques to Improve. Application Layer : Name space – Domain Name System – Distribution of Name Space. **(12L)**

REFERENCE BOOKS :

1. Data Communication and Networking – Behrouz A Forouzan – McGraw Hill – 4th Edition - 2006
2. Data and Computer Communications – William Stallings – Pearson – 2013
3. Computer Networks – Bhushan Trivedi – Oxford University Press - 2011

SEM. I CORE PAPER-2 : OBJECT ORIENTED PROGRAMMING USING C++

Unit-I

Principles of Object Oriented Programming : Basic Concepts of Object Oriented Programming-Benefits of OOP –Applications of OOP – Tokens, Expressions and Control Structures : Tokens-Keywords- Identifiers and constants-Basic data types- User Defined Data Types – Derived Data types – Symbolic Constants –Type Compatibility – Declaration of Variables –Operators in C++ - Expressions and their types – Control Structures. **(12L)**

Unit- II

Classes and Objects Specifying a class –Defining Member functions – Memory allocation for objects – Static Member functions –Arrays of Objects –Objects as Function Arguments – Friendly functions –Returning Objects – Pointers to Members . Constructors and Destructors – Parameterized Constructors –Multiple Constructors – Constructors with Default Arguments – Copy Constructor – Destructors. **(12L)**

Unit-III

Operator Overloading and Type conversions : Defining Operator Overloading – Overloading Unary Operators –Overloading binary Operators – Overloading binary operators using friends –

Manipulation of Strings using operators – Rules for overloading operators – Type Conversions. Inheritance : Defining derived classes – single inheritance – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Virtual base classes – Abstract Classes –Constructors in Derived classes – Nesting of classes. **(10L)**

Unit- IV

Pointers, Virtual Functions and Polymorphism - Pointers – Pointers to Objects – this Pointer – Pointers to Derived Classes – Virtual functions – Pure virtual functions Managing Console I/O Operations : C++ streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations – Managing Output with Manipulators . **(13L)**

Unit-V

Working with Files – Opening and closing a File – Updating a file – Command-line arguments – Templates – Class templates – Class templates with Multiple Parameters – Function Templates - Function Templates with multiple parameters- Overloading of Template functions –Member function Template-Exception handling Mechanisms. **(13L)**

REFERENCE BOOKS :

- 1.Object Oriented Programming with C++ - E. Balagurusamy ,Tata Mcgraw Hill Publications – 2006
2. Object Oriented Programming with ANSI and Turbo C++ -Ashok N.Kamthane, Pearson Education Asia Publications.

SEM. I CORE PAPER-3 : VISUAL PROGRAMMING

UNIT-I

Customizing a Form - Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button - Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types - String - Numbers. **(10L)**

UNIT-II

Displaying Information - Determinate Loops - Indeterminate Loops - Conditionals - Built-in Functions - Functions and Procedures. **(12L)**

UNIT-III

Lists - Arrays - Sorting and Searching - Records - Control Arrays - Combo Boxes - Grid Control - Projects with Multiple forms - DoEvents and Sub Main - Error Trapping. **(12L)**

UNIT-IV

VB Objects - Dialog Boxes - Common Controls - Menus - MDI Forms - Testing, Debugging and Optimization - Working with Graphics (13L)

UNIT-V

Monitoring Mouse activity - File Handling - File System Controls - File System Objects - COM/OLE - automation - DLL Servers - OLE Drag and Drop – Accessing windows API – Visual basic and Databases – Visual basic and the Internet. (13L)

REFERENCE BOOKS :

1. Gary Cornell, 1999, Visual Basic 6 from the Ground up, Tata McGraw-Hill, New Delhi .
2. Noel Jerke, 1999, Visual Basic 6 (The Complete Reference), Tata McGraw-Hill, New Delhi.

SEM. I CORE PAPER-4 : SOFTWARE ENGINEERING

Unit-I

Introductions: Evolving role of software – Software characteristics, components and its applications – Generic view of software engineering – Software process models. (12L)

Unit-II

Systems Analysis: Requirements analysis – Analysis principles – Prototyping Software requirement specification – Data modeling, functional modeling and behavioral modeling. (12L)

Unit-III

Design concepts: Design and software quality, Design concepts : Abstraction, refinement, modularity, and software architecture control hierarchy structural partitioning and information hiding, Effective modular design: functional independence, cohesion and coupling – design documentation. (12L)

Unit-IV

Design Methods: Data design – Architectural design process: transform mapping and transaction mapping – interface design – procedural design. Design for Real – Time Systems : System considerations – real time systems – analysis and simulation of real time systems. (12L)

Unit-V

Software Testing Methods : Software testing fundamentals. White box testing: basis path testing and control structure testing – black box testing – testing for specialized environments. Software Testing Strategies: A strategic approach to software testing – unit testing – integration testing – validation testing – system testing. (12L)

REFERENCE BOOKS

1. R.S.Pressman "Software Engineering", (5th edition) Tata McGraw Hill, 1997.
2. Software Engineering Principles And Practices, Second Edition, Rohit Khurana ITL ESL
3. Software Engineering Principles And Practice, Waman S Jawadekar, Tata McGraw-Hill

SEM. I CORE PAPER-5 : E-COMMERCE

Unit-I

Overview of electronic commerce: introduction-definition of electronic commerce-potential benefits of electronic commerce-internet and www as enablers of electronic commerce-impact of electronic commerce on business models-electronic commerce security-organization of topics-implications for the accounting. Electronic commerce and the role of independent third parties: introduction-consulting practices and accountants-independence-cpa vision problem- new assurance services identified by the aicpa-impact of Electronic commerce on the traditional assurance function-third party Assurance of web based electronic commerce-implications for the accounting. Regulatory environment: introduction-cryptography issues-privacy issues-web linking-domain name disputes-internet sales tax-electronic agreement and digital signature – Internet service providers and international libel laws-implications for the accounting. (12L)

Unit-II

Edi electronic commerce and the internet: introduction-traditional Edi system-data transfer and standards-financial Edi-Edi systems and the internet-impact of Edi internet applications on the accounting profession. Risks of insecure system: introduction-overview of risks associated with internet transactions-internet associated risk- intranet associated risk-social engineering-risks associated with business transactions- risks associated with confidentially maintained archival-Master file and reference data- risks associated with virus and malicious-implications of the accounting. Risks management: introduction- control weakness vs control risks – Risk management paradigm – disaster recovery plans- Implications of the accounting. (13L)

Unit-III

Internet security standards:-introductions- standard setting issues and Committees - security committees and organization - security protocols and languages-messaging protocols –secure electronic payments and protocols-the role of accountants in internet related standard setting process. Cryptography and authentication: introduction-message security issues- Encryption techniques-key management-additional authentication methods-additional non repudiation techniques. (11L)

Unit-IV

Firewalls: introduction – firewall defined – TCP/IP-open system interconnect (OSI)-components of firewall-typical functionality of firewalls- network topology-securing the firewall-factors to consider in firewall design – in-house solutions Vs commercial fire wall software-limitations of security prevention provided by firewall. Introduction-the *set* protocol – magnetic strip cards-smart cards-electronic check-electronic cash. (12L)

Unit-V

Intelligent agent: introduction-definition of intelligent agent-capabilities of intelligent agent-level of agent sophistication-agent societies- intelligent agents and electronic commerce-online information Chain - limitations of agents- implications of the accounting. Web based marketing: introduction-the scope of marketing-business marketing and information technology-strategy congruence-the four P's applied to internet marketing – the fifth “P” personalization- internet marketing techniques-online advertisement mechanisms –web site design issues- Intelligent agent and their impacts on marketing techniques. (12L)

REFERENCE BOOKS

1. M. Greenstein, T. M. Feinman, 2000, Electronic Commerce, Tata McGraw Hill, New Delhi.
2. Kalakota & Whinston, 2000, Frontiers of Electronic Commerce, 5th Indian Reprint, Pearson Edn., Delhi.

I SEMESTER PRACTICAL LISTS

C++ Programming - Practical Lists

- 1) **Write programs for the demonstration of following in C++**
 1. Classes and Objects
 2. Function Overloading
 3. Constructors and Destructors
 4. Friend function
 5. Inline Function
 6. Operating Overloading
 7. Conversion function
 8. Inheritance
 9. Method Overriding
 10. Virtual Functions
 11. Virtual Base Class
 12. Working with Files
 13. Function Templates and Exception Handling
 14. Class Template
- 2) Write C++ program using classes to find the smallest number in an array of “N” elements using pointers.
- 3) Design classes such that they support the following statements:
 - a. Rupee to dollar conversion
 - b. Dollar to Rupee conversion
- 4) To overload stream operators for reading or displaying contents of vector class's objects as below

```
cin>>v1;cout<<v2;
```
- 5) Define a class to represent a bank account, Data members;

1. Name of the Depositor
2. Account Name
3. Type of Account
4. Balance amount in the account

Member Function

1. Assign initial values
2. To deposit an amount
3. To withdraw an account
4. To display name and balance

Write a main program to test the program.

Visual Programming Lab – Practical Lists

1. Create a Text box Demo using command button Clear Text InsertDate, Show Message
2. Write a program using if... then, if ... else...end if, for..next loop and select case.
3. Display Date and Time using Timer control with Text Box and command Button.
4. Show the Adding, removing Demo using Combo box.
5. Create a new Standard Exe project, Enter the code in the Form Load event procedure. During run time the caption, mouse pointer, window state, Height and width properties should be changed.
6. Display a Demo using Common Dialog Box.
7. Create a Database using Text Box, Combo Box, Check Box, Label Box, Label Box, Frame and Command Button.

Design your form as shown below.

- Whenever the Textbox “TEXT1” gets the focus it must be cleared.
- The Textbox “TEXT1” should accept only numbers.
- The user must not be allowed to go out of the Text box “TEXT1”when it is empty

- The Text box “TEXT2” must accept only alphabets (uppercase)
- The Text box “TEXT3” should accept only a maximum of 8 digits and only numbers
- “TEXT4” is to input a special allowance to the female candidates. So the user must be allowed to enter values in it only if the candidate is a female candidate
- If any of the allowances is applicable to the candidate it must be displayed in the respective label boxes

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- When the user clicks the “OK” button a confirmation message must be displayed in the respective label box “Label7”
 - When the user clicks the “Cancel “ button a cancellation message must be displayed in the above mentioned label control and all the textboxes must be cleared .
 - When the user clicks the “Exit “ button stop the execution of the program .
8. Develop a application using Frame ,Check box, Option box.
 9. Design your form with 19 commands & a Text box and perform a Calculator Project ,which can able to work as like a Windows Calculator.
 10. Write a function procedure to find simple interest
 11. Write an event procedure to find the sum of numbers from 1 to selected value. Use a horizontal scroll bar to set the maximum value.
 12. Create a Data base with the following given fields using Data Visual Manger Student Number, Name, Tamil, English, Maths, Physics, Chemistry marks.
 13. Create a Menu Control using File New, Open, Save, Save as, Close, Exit, Edit, Option, Help
 14. Create the pop- up menu items Bold, Italic, Underline, Blue, Green, Red, Black, Exit. Place a text box in the form. On selecting an item in the pop-up menu the corresponding effect should be displayed.

SEM. II CORE PAPER-1 : ADVANCED JAVA PROGRAMMING

Unit-I

Introducing Java-The Evolution of Java-The logical evolution of C to C++ and Java-Object oriented programming concepts and java programming with java. Getting started with Java Developer’s kit(JDK)- The Java developer’s environment. The Java browser and the world wide web –Navigating the world wide web –using URL’s- web surfing with Java enhanced browsers –Web-Hot spots for Java developers-Java tools-Java language. **(12L)**

Unit-II

Fundamentals of Java language-Token-Using data types-Expressions-Declarations-control flow-Building objects-An introduction to classes- working with objects-packages-Inheritance-Interfaces-threads-exceptions-streams. (10L)

Unit-III

Java API packages, The structure of API Packages. Using the Java API, API web reference Structure. The Java Applet class, Java language- packages and its classes. The AWT class library-Introduction to the AWT-Using the frame class to implement application windows-Implementing dialog boxes with dialog class –organizing the components using the panel and layout classes-using common GUI controls-using Fonts - image related classes-using scroll bars. The java I/O and utility class libraries. The Net and debug class libraries (13L)

Unit-IV

Defining the applet structure- building the applet- The Java extensions to HTML – Adding animation to web documents. The reducing animation flickers- Publishing a Java- presentation on the web. Applets reuse-adding functionality to existing applets –when to reuse –when to rewrite-extending an applet-Testing the extended applet.

JDBC: Java Database Connectivity, Types of JDBC drivers, Writing JDBC applications, Types of Statement objects, Types of resultset, Inserting an updating records, using transactions. (13L)

Unit-V:

Java Servlets: Java Servlets and CGI Programming –A Simple Java Servlet –Anatomy of a Java Servlet Reading Data from a Client –Sending Data to a Client – Working with Cookies Java Server Pages: JSP-JSP tags-Tomcat-Request String –User sessions-Cookies-Session Object. (12L)

REFERENCE BOOKS

1. Peter Norton And William Stanek –Peter Norton’s Guide to Java Programming- Techmedia-1997
2. Alan.R.Willamson and Ceri L.Moran-Java Database Programming –Prentice Hall 1997.
3. C.Muthu, Programming with Java, 2nd Edition ,VNI
4. Joseph O’Neil, Java Beans Programming, TMH

SEM. II CORE PAPER-2 : RDBMS CONCEPTS AND ORACLE

Unit-I

Introduction – Purpose of data base systems – Data Models – Data Languages- Transaction management- storage Management-DBA –Database Users – System Structures – E-R Models- Entity and Entity Relationships – Mapping constraints and E-R Diagrams. **(10L)**

Unit-II

Structure of Relational databases– Relational Algebra – Tuple Relational calculus – Domain Relational Calculus- Relational commercial languages (SQL, QBE, QUEL)- Integrity constraints –Normalization – Boyce –Codd – Third and Fourth normal forms – domain – Key normal form. **(13L)**

Unit-III

Basic SQL Operations – creating a table – Insert- Rollback-Commit – AutoCommit-Delete- Update- Select, From, where and Order by -Single value tests – Like – simple tests against a list of values – Combining logic – Combining tables -Dropping tables - Dropping a column- creating a table from a table – Date functions – Conversion functions- Translate-Decode-Creating a view – Advanced sub queries-Outer joins-Natural & Inner joins-Union, Intersect & Minus – synonyms- indexes- Tablespace -Clusters- Sequences. **(12L)**

Unit-IV

Basics of Object – Relational databases: Objects – Abstract Data types – Nested tables - Varying arrays – Large objects –References - Object Views – Naming conventions for objects- Structure of an Object.

Users, Roles and Privilege: Creating a user – password management - Three Standard roles – Format for Grant command – Revoking privileges – what users can Grant: Moving to another user- Create synonym – Create a role – Granting privileges to a role – Granting a role to another role – Adding password to a role – Removing a password from a role – Enabling & Disabling roles – Revoking privileges from a role – dropping roles. **(13L)**

Unit-V

An Introduction to PL/SQL: PL/SQL overview- Declarations section - Executable commands section – Exception handling section – Triggers: Syntax – Types of Triggers: Row Level – statement – level – before & after – instead of – Schema – Database – Level triggers – Enabling & Disabling triggers – Replacing & Dropping triggers – Procedures, functions & Packages: syntax – Compile – Replace – Drop procedure, Functions & Packages – Cursor Management. **(12L)**

REFERENCE BOOKS

1. Database System Concepts– Abraham Silberchatz, Henry k. Horth, McGraw Hill – 2001.
2. ORACLE 9i – The Complete Reference – Kevin Loney, George Koch & The Experts at Tusc, Tata McGraw Hill Publishing company Ltd., 2002.

SEM.II CORE PAPER-3 : PRINCIPLES OF INFORMATION TECHNOLOGY

Unit-I

INTRODUCTION TO COMPUTERS – Generations of modern computers – Classification of digital computer systems – Anatomy of a digital computer – computer software – Hardware/software interaction – Classification of software – Operating systems (functions & classification of Os) – Introduction to Database Management system (DBMS – benefits – functions – DB users). (12L)

Unit-II

Telecommunications - Introduction to Telecommunications: Analog and Digital Signals - Modulations - Types of modulations - Pulse modulation techniques – digital modulation – modems

Computer Networks: Overview of networks - Communication processors - Communication media - Telecommunication Software – Types of network – network topology.

Communication System : Radio- TV – Microwave systems – Communication satellites – Radar – Fiber optics – ISDN – ADSL – T1 & T3 line connection. (12L)

Unit-III

Introduction to Multimedia – Multimedia Applications:- Multimedia in education and training – Multimedia in entertainment – multimedia in marketing – **Introduction to Virtual reality:** History of VR – present uses of VR – Future of VR. (10L)

Unit-IV

New Technologies in Information Technologies- Introduction to Hypermedia – Artificial Intelligence & Business Intelligence – Knowledge Discovery in Databases (KDD) – Data mining and On_Line Analytical Processing (OLAP)- Geographical Information System(GIS) (13L)

Unit-V

Application of Information Technology -Computers in business and Industry – Computers at Home – Computers in education and training- Computers in Entertainment Science, Media & Engineering- Mobile computing. (13L)

REFERENCE BOOKS

1. Fundamental of Information Technology (second edition), Alexis Leon and Mathew Leon-Leon Vikas publication.
2. Information Technology – Dennis P.Curtin, Kim Foley, Kunalson, TATA McGRAW – Hill edition.

SEM.II CORE PAPER-4 : EMBEDDED SYSTEMS

Unit-I

Embedded systems Overview - Design Challenge – Optimizing Design Metrics, Processor Technology, IC Technology – Introduction- Full Custom (VLSI) IC Technology -Semi Custom (ASIC) IC Technology, Programmable Logic Device (PLD) IC Technology.-Design Technology, Trade – Offs- Custom Single – Purpose Processors: Hardware - Combinational Logic, Sequential Logic, Custom Single - Purpose Processors Design, Optimizing Custom Single - Purpose Processors. **(12L)**

Unit-II

General Purpose Processors: Software – Introduction- Basic Architecture-Operation-Programmer’s View - Development Environment - Application – Specific Instruction – Set Processors, Selecting a Microprocessor, General Purpose Processor Design - Standard Single - Purpose Processors: Peripherals – Introduction - Timers - Counters and watchdog Timers - UART - Pulse width modulators - LCD Controllers - Keypad Controllers. **(12L)**

Unit-III

Memory - Introduction, Memory write ability and storage permanence - Common Memory Types - Composing Memory, Memory Hierarchy and cache - Advanced RAM. Interfacing – Introduction Communication Basics - Microprocessor Interfacing: I/O Addressing - Microprocessor Interfacing: Interrupts - Microprocessor Interfacing: Direct Memory Access - Arbitration, Multilevel Bus Architectures - Advanced Communication Principles - serial Protocols - Parallel Protocols-wireless protocols. **(10L)**

Unit-IV

State Machine and Concurrent Process Models - Introduction, Model vs Languages, Text vs Graphics, An Introductory example- A Basic State Machine Model: Finite – state machines- Finite - state machine with data path Model: FSMD - Using state machines- HCFSM and the State charts Language- Program – state machine model- process model Concurrent processes - Communication among Processes - Synchronization among processes - Implementation, Data flow model- Real time systems. **(13L)**

Unit-V

Advanced Embedded Systems: ATmega Processors-Introduction-architecture-instruction set-SREG-general purpose registers-stack-interrupt vectors AT 8535 Processor-Serial Ports-Memory map-Addressing modes-Operational features and programming aspects-control block-choosing the prescaler-ATmega Analog to digital converters-Serial I/O-Programmable logic-

Introduction to Xmega family-Infrared communication-Data encryption and decryption-DMA.
(13L)

REFERENCE BOOKS

1. Frank Vahid/Tony Givargis – Embedded System Design, A unified Hardware /Software Introduction – John Wiley & Sons Inc.
2. B.Kanta Rao-Embedded Systems-PHI Learning Private Limited, 2011.

ELECTIVE-I Group (A) : MANAGEMENT INFORMATION SYSTEMS

Unit-I

Introduction to Management of Information Systems-Introduction - Role and Importance of Management-Process of Management –Organization structure and theory –Strategic Management of Business.
(12L)

Unit-II

Basics of Management Information Systems-Basics of Management Information Systems-Decision making –Information Systems-Systems analysis and design –development of MIS-Choice of information Technology.

Nature of it decision, Information Technology to implementation plan, choice of the information Technology and the Management Information System.
(12L)

Unit -III

Application of Management Information Systems- Application in Manufacturing Sector - Applications in Service Sector – Decision Support Systems – Enterprise Management Systems.
(10L)

Unit-IV

Technology in Management Information Systems – Technology of Implementation Systems-Database Management Systems – Object Oriented Technology : Conceptual presentation. Client- Server architecture – Networks.
(12L)

Unit -V

Business Reprocess Engineering, Data Warehouse: Architecture of Implementation, Electronic Business Technology, WEB: A tool for Business Management. Case study: A Comprehensive case study on MIS, Information Management. System Development Cycle, Enterprise Management System, MIS in Research environment, Role of MIS in Consumer Goods Industry, Role of MIS in Capital Goods Industry, Comparison of Internet and Intranet Applications, knowledge of Management.
(14L)

REFERENCES BOOKS

1. W.S. Jawadkar - Management Information Systems – Second Edition - Tata McGraw Hill -2002.
2. Robert Schulthesis & Mary Summer - Management Information Systems- TheManager's View – Tata McGraw Hill -1999.

ELECTIVE-I Group (B) BIG DATA ANALYTICS

Unit-I

A new paradigm for big data: Scaling with a traditional database – Desired properties of a Big Data System-The problems with fully incremental architectures-Lambda Architecture-Recent Trends in Technology.

Batch Layer: DATA model for Big DATA - The properties of data- the fact-based model for representing data- Graph schemas. **Data Model for Big Data:** Why serialization framework? - Apache thrift – Limitations of serialization frameworks. **(12L)**

Unit-II

Data Storage on the batch layer: Storage requirements for the master dataset – Choosing a storage solution for the batch layer – How distributed filesystems work – Storing a master dataset with distributed filesystem – Vertical partitioning – Low-level nature of distributed filesystems – Storing the SuperWebAnalytics.com master dataset on a distributed filesystem. **(10L)**

Unit-III

Data storage on the batch layer: Illustration: Using the Hadoop Distributed File System – Data storage in the batch layer with Pail – Storing the master dataset for SuperWebAnalytics.com.

Batch layer: Motivating examples – Computing on the batch layer – Recomputation algorithms vs. incremental algorithms –Scalability in the batch layer – MapReduce: a paradigm for Big Data computing – Low-level nature of MapReduce-Pipe diagrams: a higher-level way of thinking about batch computation

Batch layer: Illustration: An illustrative example- Common pitfalls of data-processing tools – An introduction to JCascalog – Composition.

An example batch layer: Architecture and algorithms: Design of the SuperWebAnalytics.com batch layer – Workflow overview – Ingesting new data – URL normalization – User-identifier normalization – Duplicate pageviews – Computing batch views. **(13L)**

Unit-IV

Serving layer: Performance metrics for the serving layer- The serving layer solution to the normalization/denormalization problem- Requirements for a serving layer database- Designing a serving layer for Super WebAnalytics.com – Contrasting with a fully incremental solution.

Serving layer: Illustration: Basics of ElephantDB – Building the serving layer for SuperWebAnalytics.com (12L)

Unit-V

Speed Layer: Realtime views: Computing realtime views – Storing realtime views – Challenges of incremental computation – Asynchronous versus Synchronous updates – Expiring realtime views.

Realtime views: Illustration: Cassandra’s data model – Using Cassandra.

Queuing and stream processing: Queuing – Stream processing – Higher-level, one-at-a-time stream processing – SuperWebAnalytics.com speed layer.

Queuing and stream processing: Illustration: Defining topologies with Apache Storm – Apache Storm clusters and deployment –Guaranteeing message processing – Implementing the SuperWebAnalytics.com unique-over-time speed layer.

Lambda Architecture in depth: Defining data systems – batch and serving layers – Speed layer – Query layer.

Case Studies: An example of Batch Layer implementation. (13L)

REFERENCE BOOKS:

1. “Big Data Principles and best practices of scalable real-time data systems”, Nathan Marz, James Warren, Manning publications co., Edition 2016, published in India by Dreamtech Press, 19-A, Ansari Road, Daryaganj, New Delhi.
2. Big Data: A Revolution That Will Transform How We Live, Work, and Think by Viktor Mayer-Schönberger, Kenneth Cukier Published March 5th 2013 by Houghton Mifflin Harcourt.

II SEMESTER PRACTICAL LISTS

JAVA PROGRAMMING LAB –Practical Lists

1. Programs using simple java classes
2. Preparation of employee payroll using arrays and control structures
3. Write a program to prepare mark sheet using inheritance
4. Prepare a salary slip of an employee with personal details using interface
5. Write a java program using string classes
6. Write a java program to design a calculator to perform arithmetic operation
7. Write a java program to create and implement an interface
8. Write a java program to create a thread
9. Program Using runnable interface
10. Write a program using java utilities
11. Database applications using JDBC connectivity
12. Simple Java AWT application
13. Simple Java Servlet application
14. Simple JSP internet application.

ORACLE LAB –Practical Lists

1. Table creation and Manipulations – Insert, Delete, Select and Update
2. Use of constraints – primary key, references, unique, not null, default etc. in Table creation.
3. Creation and use of sequence, index schema objects in table manipulations
4. PL/SQL program to generate Multiplication Table
5. PL/SQL program for cursor Management
6. PL/SQL program for Raising application error.
7. Create of function to check whether the given string is a palindrome or not.
8. PL/SQL program for demonstrating user defined Exception in oracle
9. PL/SQL program for demonstrating built-in Exception

10. PL/SQL program for demonstrating built-in Exception
11. Creation of procedure for electricity bill preparation using table
12. PL/SQL program for demonstrating trigger procedure.

SEM. III CORE PAPER-1: WEB DESIGNING

Unit-1 Web programming Basics and Installations

Web Publishing: A Quick look-HTML 4.0: the web Publishing Foundation- HTML basics- Putting your Server to work-Server side programming- XML Basics. **(12L)**

Unit-II Installation and Configuration

Getting up and running: Installation Quick Start Guide- Installing and configuring MySQL- Installing and configuring Apache-Installing and configuring PHP. **(10L)**

Unit-III PHP Language Structure

The Building blocks of PHP- Flow Control Functions in PHP- Working with Functions- Working with Arrays- Working with Objects- Working with Strings, Dates and Time- Working with Forms- Working with Cookies and User Sessions- Working with Files and Directories Working with Images **(14L)**

Unit-IV PHP and MySQL Integration

Understanding the Database Design- Process Learning Basic SQL Commands Using Transactions and Stored Procedures in MySQL- Interacting with MySQL Using PHP. **(12L)**

Unit-V Basic Projects

Managing a Simple Mailing List- Creating an Online Address Book- Creating a Simple Discussion Forum- Creating an Online Storefront and shopping Cart Mechanism- Creating a Simple Calendar- Restricting Access to Your Applications- Logging and Monitoring Web Server Activity- Application Localization- Working with XML- Connecting to Web Services Apache Performance Tuning and Virtual Hosting- Setting Up a Secure Web Server- Optimizing and Tuning MySQL. **(12L)**

REFERENCE BOOKS:

1. Sam Teach Yourself PHP, MySQL and Apache All in One, 5th Edition, Julie Meloni
2. Dynamic Web Publishing, Second Edition, Shelley Powers, Techmedia
3. Steve Suehring, Tim Converse and Joyce Park, "PHP 6 and MySQL 6 Bible", Wiley India

reprint, 2009.

4. Robert Sheldon, Geoff Moes, "Beginning MySQL", Wrox, 2005.

5. BEN FORTA, "MySQL Crash course "SAMS, 2006.

SEM. III CORE PAPER-2 : OPERATING SYSTEMS

Unit-I

Operating System Overview: Objectives and Functions - Processes: Process Description and Control – UNIX SVR4 Process Management – Threads and Multithreading – Symmetric Multiprocessing - Windows Thread Management - Solaris Thread and SMP Management - Linux Thread Management - Android Thread Management (13L)

Unit-II

Mutual Exclusion and Synchronization: Semaphores – Monitors - Message Passing – producer-consumer problem – readers writers problem - Principles of Deadlock – Deadlock prevention – Avoidance – Detection (12L)

Unit-III

Virtual Memory Management: Paging – segmentation - Operating System Software policies - Windows Memory Management - Android Memory Management - Uniprocessor Scheduling: Types of Scheduling - Scheduling Algorithms - Real-Time Scheduling (10L)

Unit-IV

I/O Management and Disk Scheduling: I/O Buffering - Disk Scheduling – RAID - File Management : File Organization and Access - Secondary Storage Management – File Allocation Methods – Free Space Management - Windows File System - Android File Management - Embedded Operating Systems: Characteristics – Ecos (13L)

Unit-V

Operating System Security: Basic concepts - Intruders and Malicious Software - viruses - Distributed Processing, Client/Server, and Clusters: Client/Server Computing - Distributed Message Passing - Remote Procedure Calls – Clusters - Windows Cluster Server – Sun Cluster (12L)

REFERENCE BOOKS:

1. Operating Systems-Internals and Design Principles, Williams Stallings, Pearson, 8th Edition, 2014.
2. Modern Operating Systems, Andrew S. Tanenbaum, Pearson,, 4th Edition, 2014.
3. Operating System Concepts, Abraham Silberschatz , Peter B. Galvin, Greg Gagne, John Wiley & Sons, 8th Edition, 2008.

SEM. III CORE PAPER-3 : NETWORK SECURITY AND CRYPTOGRAPHY

Unit-I

Introduction, Attacks, services and Mechanisms - security attacks - security services - A model for internetwork security - Internet standards and RFCs. Classical Encryption Techniques: symmetric cipher Model - Substitution Techniques -Transportation Techniques Rotor Mechanism – Steganography. **(12L)**

Unit-II

Block ciphers and the data encryption standard simplified DES - Block Cipher Principles -The Data encryption standard -The strength of DES - Differentials and Linear Cryptanalysis -Block Cipher design principles -Block Cipher modes of operations. Public Key Cryptography and RSA: Principles of Public - Key Cryptosystems The RSA Algorithm. **(13L)**

Unit-III

Key Management; Other Public-Key Cryptosystems: Key Managements- Diffie Hellman Key Exchange-Elliptic curve Arithmetic - Elliptic curve Cryptography Message Authentication & Hash functions: Authentication Requirements-Authentication functions-message Authentication Codes- Hash functions- Security of Hash functions & MACS. Digital Signatures -Authentication Protocols -Digital Signature Standard. **(13L)**

Unit-IV

Authentication applications: Kerberos X 509 Authentication service. Electronic Mail security: Pretty good Privacy - S/MIME 445 IP Security: IP Security overview - IP Security Architecture -Authentication Header - Encapsulation security Payload. **(10L)**

Unit-V

Web Security: Web Security Considerations - Secure Sockets Layer and Transport Layer Security - Secure Electronic Transactions System Security: Intruders - Intrusion detection - Password Management. Firewalls: Firewalls Design Principles - Trusted Systems **(12L)**

REFERENCE BOOKS:

1. William Stallings,"CRYPTOGRAPHY AND NETWORK SECURITY - PRINCIPLES AND PRACTICES", Pearson Education, Third Edition, 2003.
2. William Stallings,"NETWORK SECURITY ESSENTIAL - APPLICATIONS AND STANDARDS", Pearson Education, 2003.
3. Atul kahate,"CRYPTOGRAPHY AND NETWORK SECURITY", TMCH, 2003

4. Charlie Kanfman, Radio Pearlman, Mike Speciner, "NETWORK SECURITY", Second Edition, Pearson Education Asia.

SEM. III CORE PAPER-4 : Software Testing

Unit-I

Purpose of Software Testing – Some Dichotomies – A model for testing – Playing pool and consulting oracles – Is Complete testing possible – The Consequence of bugs – Taxonomy of Bugs. (10L)

Unit-II

Software testing fundamentals – Test Case design – Introduction of Black box testing and White box testing – Flow graphs and path testing – Path testing Basics – Predicates, Path Predicates and Achievable Paths – Path Sensitizing – Path Instrumentation – Implementation and Application of Path testing. (12L)

Unit-III

Transaction flow testing – Transaction Flows-Techniques – Implementation Comments- Data Flow Testing –Basics – Strategies – Applications, Tools and effectiveness- Syntax testing – Why, What, How – Grammar for formats – Implementation – Tips. (13L)

Unit-IV

Logic based testing – Motivational overview – Decision tables – Path expressions – KV charts – Specifications – States, state graphs and transition testing – State Graph – Good & bad states – State testing metrics and Complexity. (13L)

Unit-V

Testing GUIs – Testing Client – Server Architecture – Testing for real-time system – A strategic approach to software testing –Issues – Unit testing – Integration testing – Validation Testing – System testing – The art of Debugging. (12L)

REFERENCE BOOKS

1. Boris Beizer, Software testing techniques, Dreamtech Press, Second Edition – 2003.
2. Myers and Glenford.J., The Art of Software Testing, John-Wiley & Sons,1979
3. Roger.S.Pressman, Software Engineering – A Practitioner s Approach, Mc-Graw Hill, 5th edition, 2001
4. Marnie.L. Hutcheson, Software Testing Fundamentals, Wiley-India, 2007.

SEM. III CORE PAPER-5: RESEARCH METHODOLOGY

Unit-I

Research Methodology: An Introduction - Meaning of Research - Objectives of Research - Types of Research, Motivation in Research - Research Approaches, Significance of Research - Research Methods Verses Methodology - Research and Scientific Method - Research Process - Criteria of Good Research - Problems Encountered by Researchers in India. Defining the Research Problem: What is a Research Problem? - Selecting the Problem - Technique Involved in Defining a Problem - Research Design: Meaning - Need for research Design - Features of a

Good Design - Important Concept relating to Research Design - Different Research Designs - Basic Principles of Experimental Designs. (12L)

Unit-II

Sampling Design: Census and sample survey - Implications of a sample design - Steps in sample design - Criteria of selecting a sampling procedure - Characteristics of a good sample design - Different types of sample designs - How to select a random sample? - Random sample from an infinite Universe - Complex random sampling designs - Measurement and scaling Techniques: measurement in research - Measurement scales - Sources of error in measurement - Tests of sound measurements - Technique of developing measurement tools - Scaling, meaning of scaling - Scale classification bases - Important scaling techniques - Scale construction techniques. (12L)

Unit-III

Methods of Data Collection - Collection of Primary Data - Observation Method - Interview method - Collection of Data through Questionnaires - Collection of Data through Schedules - Some Other Methods of Data Collection - Collection of Secondary Data - Selection of Appropriate Method for Data Collection - Interpretation and Report writing - Meaning of Interpretation, Why Interpretation? - Technique of Interpretation, Precaution in Interpretation - Significance of Report Writing - Different Steps in Writing Report - Layout of the Research Report - Types of Reports - Mechanics of Writing a Research Report - Precautions for Writing Research Reports. (12L)

Unit-IV

Chi-Square Test for large samples – Definition of Chi-Square – Limitations of Chi-Square test - Chi-Square test as a test of goodness of fit and as a test of independence – Yate’s correction and its applications – Analysis of variance(ANOVA) : Concept – One way ANOVA – ANOVA in test in Latin Square Design (12L)

Unit - V

Algorithmic Research – Introduction - Algorithmic Research Problems - Types of Solution procedure/Algorithm - Steps of Development of Algorithm - Steps of algorithmic Research - Design of Experiments and Comparison of Algorithms - Meta Heuristics for Combinatorial Problems - The Computer: Its Role in research - The computer and Computer Technology - The Computer System - Important Characteristics - Computer Applications- Computers and Researchers. (12L)

REFERENCE BOOKS

1. C.R.Kothari, "Research Methodology Methods and Techniques", (Second Revised Edition), New Age International Publishers, New Delhi, 2010.
2. R.Panneerselvam, "Research Methodology", PHI Learning Private Limited, New Delhi, 2009.

ELECTIVE-II Group (A) : DATA WAREHOUSING AND MINING

Unit-I

Introduction: Data Mining tasks – Data Mining versus Knowledge Discovery in Data bases – Relational databases – Data warehouses – Transactional databases – Object oriented databases – Spatial databases – Temporal databases – Text and Multimedia databases – Heterogeneous databases - Mining Issues – Metrics – Social implications of Data mining **(12L)**

Unit-II

Data Preprocessing: Why Preprocess the data – Data cleaning – Data Integration – Data Transformation – Data Reduction – Data Discretization. **(11L)**

Unit-III

Data Mining Techniques: Association Rule Mining – The Apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint Based Association Mining **(11L)**

Unit-IV

Classification and Prediction: Issues regarding Classification and Prediction – Decision Tree induction – Bayesian Classification – Back Propagation – Classification Methods – Prediction – Classifiers accuracy **(13L)**

Unit-V

Clustering Techniques: cluster Analysis – Clustering Methods – Hierarchical Methods – Density Based Methods – Outlier Analysis – Introduction to Advanced Topics: Web Mining , Spatial Mining and Temporal Mining **(13L)**

REFERENCE BOOKS

1. J. Han and M. Kamber , 2001, Data Mining: Concepts and Techniques, Morgan Kaufmann, .New Delhi-27
2. M. H.Dunham, 2003, Data Mining : Introductory and Advanced Topics , Pearson Education, Delhi.
3. Paulraj Ponnaiah, 2001, Data Warehousing Fundamentals, Wiley Publishers.
4. S.N. Sivananda and S. Sumathi, 2006, Data Mining, Thomsan Learning, Chennai.

ELECTIVE-II Group (B) MOBILE COMPUTING

Unit-I

Introduction: Wireless transmission, Frequencies for radio transmission, Signals, Antennas, Signal Propagation, Multiplexing, Modulations, Spread spectrum, MAC, SDMA, FDMA, TDMA, CDMA, Cellular Wireless Network. **(12L)**

Unit-II

Telecommunication systems: GSM, GPRS, DECT, UMTS, IMT-2000, Satellite Networks, Basics, Parameters and Configurations, Capacity Allocation, FAMA and DAMA, Broadcast Systems, DAB, DVB. **(12L)**

Unit-III

Wireless LAN: IEEE 802.11, Architecture, Services, MAC, Physical layer, IEEE802.11a-802.11b standards, HIPERLAN, BlueTooth. **(12L)**

Unit-IV

Mobile IP, Dynamic Host Configuration Protocol, Routing, DSDV, DSR, Alternative Metrics **(12L)**

Unit-V

Traditional TCP, Classical TCP improvements, WAP, WAP 2.0, WML Basics, WML Cards. **(12L)**

REFERENCE BOOKS

1. Jochen Schiller, "Mobile Communications", 2/e, PHI/Pearson Education, 2003.
2. William Stallings, "Wireless Communication and Networks", PHI/Pearson Education, 2002
3. Kaveh Pahlaven, Prasanth Krishnamoorthy, "Principles of Wireless Networks", PHI/Pearson Education, 2003.
4. Hazysztof Wesolowshi, "Mobile Communication Systems", John Wiley and Sons Ltd, 2002.

III SEMESTER PRACTICAL LIST

WEB DESIGNING AND NETWORK LAB

Web Designing – Practical Lists

1. Write a HTML code to display information about your college use
 - 1)Bold Tag
 - 2)Centre Tag
 - 3)Heading & Font tags. Add background colour and picture
2. Create a HTML document to display a list of four flowers and link each one to another document displaying brief description of the flower. Add pictures wherever possible.
3. Create a table to display the marks obtained in the exam.
4. Write an HTML code to display a list of 5 cars in a frame .Link each one to a brief description in second frame The left frame should display the list and the right frame should display the paragraph about the frame.
5. Page hit counter
6. Input/output operations
7. Reading/writing files and Directories
8. Calendar application using PHP
9. MySQL Connectivity and Database manipulations
10. Session maintenance in PHP.

Network- Practical Lists

1. Write a socket program for Echo commands
2. Write a socket program for Ping commands
3. Write a socket program for Talk commands
4. Create a socket (TCP) between two computers and enable file transfer between them.
5. Write a socket for HTTP for Web page upload & download
6. Create a Socket (UDP)
7. Write a program for TCP Module implementation
8. Perform a case study for the shortest path routing algorithms to select the network and to select the network path.

Table - 3 : Common Course Structure for **P.G. Degree Programme in Science – M.Sc. (General)** #

(with effect from the academic year 2017-2018 onwards)

M.SC. PHYSICS

Sem. (1)	Sub. No. (2)	Subject Status (3)	Subject Title (4)	Contact Hrs./ Week (5)	Credits (6)
I	1	Core - 1	Classical Mechanics	6	4
	2	Core - 2	Mathematical Physics I	6	4
	3	Core - 3	Integrated Electronics	5	4
	4	Core - 4	Non Linear Dynamics	5	4
	5	Core - 5 Practical - 1	General Physics Experiments I	4	2
	6	Core - 6 Practical – 2	Electronics Experiments I	4	2
	Subtotal				30
II	7	Core - 7	Mathematical Physics II	5	4
	8	Core - 8	Condensed Matter Physics	5	4
	9	Core - 9	Microprocessor & Microcontroller	4	4
	10	Core - 10	Numerical Methods & C++ Programming	4	4
	11	Core - 11	Field Work	4+2	3
	12	Core - 12 Practical - 3	General Physics Experiments Ii	4	2
	13	Core - 13 Practical - 4	Electronics Experiments II	4	2
Subtotal				30	23

#

1.) Bio-Chemistry	2.) Biotechnology
3.) Botany	4.) Dietics and Food Management
5.) Electronics	6.) Electronics & Communication
7.) Geology	
8.) Hotel Management and Catering Science and Applied Nutrition	
9.) Nutrition and Dietics	10.) Physics
11.) Zoology	

Sem.	Sub. No.	Subject Status	Subject Title	Contact Hrs./ Week	Credits
(1)	(2)	(3)	(4)	(5)	(6)
III	14	Core - 14	Quantum Mechanics I	6	4
	15	Core - 15	Electromagnetic Theory	6	4
	16	Core - 16	Statistical Mechanics	5	4
	17	Core - 17	Research Methodology	5	4
	18	Core - 18 Practical - 5	Advanced Physics Experiments I	4	2
	19	Core - 19 Practical - 6	Microprocessor Experiments	4	2
	Subtotal				30
IV	20	Core - 20	Quantum Mechanics II	4	4
	21	Core - 21	Spectroscopy	4	4
	22	Core - 22	Nuclear and Particle Physics	4	4
	23	Core - 23 Practical - 7	Advanced Physics Experiments II	4	2
	24	Core - 24 Practical - 8	C++ Programming	4	2
	25	Elective - 1	Elective / Field Work / Study Tour	3+3	3
	26	Core - 25	Project	7+9	8
Subtotal				30	27
Total				120	90

+ Extra hours for the Field Work/Study Tour/Project

For the Project, flexible credits are b/w 5 – 8 & Hours per week are b/w 10 - 16.

Total number of credits \geq 90	:	90
Total number of Core Courses	:	25 (15 T + 8 P + 1 Prj. + 1 FW.)
Total number of Elective Courses / F.W. / S.T.:	:	1
Total hours	:	120

Core - 1 Classical Mechanics

Unit I Fundamental Principles and Lagrangian Formulation

Mechanics of a particle and a system of particles - Conservation laws - Constraints - Generalised Co-ordinates - Principle of Virtual work - D'Alembert's principle and Lagrange's equations - Applications of Lagrange's equations - Hamilton's principle - Lagrange's equation from D'Alembert's principle.

Unit II : Motion Under a Central force : Two body problem

Equivalent one body problem - General features of Central force motion - Equivalent one dimensional problem - General features of the orbits - Motion under inverse square law - Kepler problem - Virial theorem - Unbound motion Rutherford scattering.

Unit III : Rigid Body Dynamics

Mechanics of a rigid body - Displacement of a rigid body - Orthogonal transformation - Eulerian angles - Infinitesimal rotation - Coriolis effect - Kinematics of a rigid body moments and products of inertia - K.E. of a rigid body - Euler's equation of motion - Torque free motion.

Unit IV : Hamilton's Formulation

Hamilton's equation from variational principle - Principle of least action – Applications - Legendre transformation - Canonical transformations - Lagrange and Poisson brackets - Equation of motion and conservation theorems in Poisson's brackets - Hamilton Jacobi method - Application to Harmonic oscillator - Hamilton's characteristic function - Separation of variable - Action angle variables - Kepler problem in action angle variables.

Unit V : Mechanics of Small Oscillations

Stable and unstable equilibrium - Formulation of the problem - Lagrange's equation of motion for small oscillations - Properties of T, V and w - Normal Co-ordinates and normal frequencies of vibration - Double pendulum - Free vibrations of linear triatomic molecule.

Books for Study :

1. Helbert Goldstein, Charles P. Poole John Safco, Classical Mechanics, Pearson, Chennai.
2. Gupta Kumar, Sharma, Classical Mechanics, Prakati Prakasham, Meerut.

Core 2 Mathematical Physics I

Unit I Vector Analysis

Gauss divergence theorem - Deductions from Gauss divergence theorem - Green's theorem - Green's theorem in a plane - Classification of vector fields.

Unit II Matrices

Eigen values; Eigen Vectors - Characteristic equation of matrix - Cayley Hamilton theorem - Some important theorems of eigen values and eigen vectors - diagonalisation of matrices - Differentiation and integration of matrices - Power of matrices - Exponential of a matrix - Matrices in Physics.

Unit III : Special Functions :

Bessel differential equation and Bessels' function of I Kind - Generating function - Recurrence relations - Laguarre's differential equation and Laguerie polynomial - Generating function - Recurrence relations.

Unit IV : Fourier's Integral Transforms

Introduction - Fourier's transform (FT) - Properties of FT - FT of a derivative - Fourier sin and cosine transforms of derivatives - FT of functions of two or three variables - Finite FT - Simple applications of FT.

Unit V : Laplace Integral Transforms

Laplace Transform (LT) - Properties of LT - LT of derivation of a function - LT of periodic functions - Properties of inverse LT - Convolution theorem - Evaluation of inverse LT by convolution theorem - Application of LT.

Book for Study :

1. Sathya Prakash, Mathematical Physics, Sultan chand & sons, New Delhi.

Books for Reference :

1. Applied mathematics for Engineer and Physics,. Louis A.Pipes Lawrence R.Harvill, Mc Graw Hill Ltd., 1970.

2. Eugene Buthov, Mathematical Physics, Addison Wesley 1968.

Core 3 Integrated Electronics

Unit I Devices, Applications and Integrated Circuits

FET-Types of FET-Characteristics and applications of FET, MOSFET- SCR, DIAC, TRIAC-High frequency device-Integrated Circuits-IC Fabrication Technology - Steps in Fabrication - Integrated Resistors and Capacitors-VLSI Technology.

Unit II Digital Electronics

Logic Families - DTL, RTL, TTL, ECL, I^2L , CMOS, NMOS and PMOS - DTL type AND, OR, NAND and NOR gates - RTL and TTL type NAND - CMOS NOR and CMOS NAND - Flip Flops: RS-RST-D- JK- JK Master/Slave- Asynchronous Counters and Synchronous Counters - Registers.

Unit III OP AMP and Applications

Characteristics and Parameters -DC Analysis of IC OP AMP- Applications of OP AMP - Instrumentation amplifier -Sample and Hold System- Analog Multiplexer -Integrator - Differentiator- Design of Analog circuits for the solution of Simultaneous and Differential Equations- Filters: First and Second order LOW, HIGH and BAND pass filters.

Unit IV Timer, VCO, PLL, and Applications

Timer-555 Timer IC-Internal Architecture and Working-Modes of Operation: Monostable and Astable operation- Applications-Voltage Control Oscillator - IC 566-PLL Concept-PLL IC 565 - Application- Frequency multiplexer - FSK Modulation and Demodulation.

Unit V Electronic Measurement and Control

Sensors and Transducers - Measurement and Control - Signal Conditioning and Recovery -Impedance Matching - Amplification (OP Amp based Feedback Amp, Instrumentation Amp) - Noise and Noise Sources -Filtering and Noise Reduction -Shielding and Grounding - Fourier Transform - Lock- in Detector/Amplifier - Box-Car Integrator or Averager - Modulation Techniques.

Books for Study:

1. Integrated Electronics Analog and Digital Circuits and Systems, Second Edition, Jacob Millman, Christos C Halkias, Chetan Parikh, Tata McGraw Hill Education Private Limited, NewDelhi.
3. Analog and Digital Electronics, U.A. Bakshi, A.P.Godse, Technical Publications, Pune.

Books for Reference :

1. Introduction to Semiconductor Devices M.S.Tyagi, John Wiley and Sons.
2. Electronic instrumentation, P.P.L. Regtien, VSSD Publications, 2005

Core 4 Nonlinear Dynamics

UNIT I Nonlinearity, linear and nonlinear oscillators

Dynamical systems-linear and nonlinear forces-Mathematical implications of nonlinearity- Working definition of nonlinearity-Effects of nonlinearity-Linear oscillators and predictability- Damped and driven nonlinear oscillators.

UNIT II Equilibrium points, bifurcations and chaos

Equilibrium points-General criteria for stability-Classification-Some simple bifurcations - Saddle node, pitch fork, transcritical and Hopf bifurcations-Discrete dynamical systems-Logistic map-Equilibrium points and their stability-period doubling phenomenon-chaos.

UNIT III Chaos in nonlinear electronic circuits

Linear and nonlinear circuit elements-nonlinear circuits-Chua's diode-Autonomous case-Bifurcations and chaos-Chaotic dynamics of MLC circuit-Analogue circuit simulation-Some other useful nonlinear circuit - Colpitt's oscillator.

UNIT IV Fractals

Self similarity-Properties and examples of fractals-Fractal dimension-Construction and properties of some fractals-Middle one third cantor set-Koch curve-Sierpinski triangle-Julia set-Mandelbrot set-Applications of fractals.

UNIT V Solitons

Linear waves-Linear non dispersive wave propagation-Linear dispersive wave propagation-Nonlinear dispersive systems-Korteweg de vries equation- solitary and cnoidal waves-Numerical experiments of Zabusky and Kruskal-birth of solitons—Properties of solitons-applications of solitons.

Book For Study:

1. Nonlinear dynamics, Integrability, Chaos, Patterns, M. Lakshmanan and S.Rajasekar, Springer, Berlin, 2003.

Books for Reference:

1. Chaos in nonlinear oscillator, controlling and synchronization, M.Lakshmanan and K.Murali.(World Scientific, Singapor,1997.)
2. Deterministic chaos, H.G.Schuster,(Verlag,Weinheim,1998.)

Core 5 Practical 1
General Physics Experiments I

Any 5 Experiments

1. *Susceptibility*

- a. Determination of susceptibility of the given paramagnetic solution by Quinke's Method for various normalities,
- b. Determination of Magnetic Moment and Bohr Magnetron from graph and by calculation for various normalities.

2. *Cauchy's Constant*

- a. Determination of Cauchy's Constant by spectrometer.
- b. Verification of the experimental result with graphically obtained value.

3. *Michelson's Interferometer*

Determination of wavelength of a source and thickness of a thin transparent medium by forming interference pattern,

4. *Anderson's Bridge*

Determination of self inductance of the given coil - (different turns/coil).

5. *Force Constants*

Calculation of force constants of a molecule from the vibrational spectral data
- At least 3 spectrum

6. *Solar Absorption Spectrum*

Importance of Solar Absorption spectrum and Fraunhofer lines Determination of wavelength of various absorptions.

7. *Thickness of a thin material/ diameter of a thread.*

Determination of thickness of a very thin material or diameter of a thread using LASER diffraction and also by Airwedge method. Comparison of the results. Variation in thickness/diameter with Load.

Core 6 Practical 2

Electronics Experiments - I

Any 5 Experiments

1. Series Voltage Regulator

Construction of a series voltage regulator using transistor (as an error amplifier) - study the regulation factors (line regulation, load regulation) - to find out the percentage of regulation.

2. Schmitt Trigger

Designing of a Schmitt trigger circuit using transistors - Trace the input and output waveforms - Draw Hysteresis curve and calculate hysteresis voltage both theoretically and experimentally.

3. Wave Form Generators

Construction of a triangular and a ramp wave generator using OP Amp and construction of 5555 timer based square wave generator. Theoretical calculation of the frequency of the output wave for various

R and C values with experimental verification.

4. Counters and Decoders

Construction and study of Modulus counters (2 to 9) using IC 7490 or any equivalent IC. Use a 7 segment decoder and a 7 segment display to show output.

5. Analog to Digital Conversion

Construction of ADC converter using Comparator and an Encoder ICs - Measurement of the digital outputs for various input voltages - Resolution measurement.

6. Construction of Constant Current Source

Construction of a constant current source using OP Amp and transistor/ FET (floating and grounded load). IR characteristics.

7. FET Characteristics and Amplifier

Drain and Transfer characteristics of FET - FET parameters from the characteristics. Designing of a voltage amplifier using FET - Frequency response and bandwidth of the amplifier.

Core 7 Mathematical Physics II

Unit I Complex analysis

Functions of complex variable - Analytic functions - Cauchy -Riemann differential equation - Harmonic functions - Cauchy's integral theorem - Cauchy's integral formula - Derivatives of analytic functions - Residues and their evaluations - Cauchy's residue theorem.

Unit II Group theory

Concept of a group - Abelian group - Cyclic group - Subgroup - Coset - Classes - Conjugate subgroups - Isomorphism and homomorphism - Reducible and irreducible representations - Some important theorems on representations - Orthogonality theorem.

Unit III Special functions II

Introduction - Legendre differential equation and Legendre polynomial - Generating functions - Recurrence relations - Hermite differential equation and Hermite polynomial - Generating function - Recurrence relations.

Unit IV Partial Differential Equations

Solution of heat flow equation (Method of separation of variables) – Linear flow in semi infinite solid : Temperature on one face given as sinusoidal function of time – Variable linear flow in an infinite bar – two dimensional heat flow - three dimensional heat flow – Heat flow in circular plate (use of cylindrical co ordinates) – Equation of motion for the vibrating string – Vibrations of a rectangular membrane - Vibrations of a circular membrane

Unit V Tensor analysis

Introduction - Scalar, contravariant and covariant vectors - Tensor of higher ranks - Algebraic operations of tensors - Symmetric and anti symmetric tensor - Fundamental tensor - Tensors in dynamic of a particle - Tensors in elasticity - Moment of inertia tensor.

Book for Study:

1. Mathematical Physics, Sathyapakash, Sultan Chand & Sons, New Delhi.

Books for Reference:

1. Applied Mathematics for Engineers and Physicsts, Louis A.Pipes, Lawrence R, Harvill, McGraw-Hill Ltd, 1970
2. Matrices and Tensors in¹ Physics- A.W.Joshi, 3rd edition, New Age International Publishers, New Delhi, 1995.

Core 8 Condensed Matter Physics

Unit I Crystallography and crystal binding

Classification of crystals - Two dimensional Brava's - Brava's lattices in 3 dimensional - crystals of inert gases-ionic crystals-covalent crystals-metals-hydrogen bonds-atomic radii-analysis of elastic strains-elastic compliance and stiffness constants-elastic wave in cubic crystals.

Unit II Lattice vibrations

Lattice waves - properties of Lattice waves - vibrational modes of a finite one - dimensional lattice of identical atoms - diatomic linear lattice - quantization of lattice vibrations - phonons momentum - Inelastic scattering by phonons, by long wave length phonons- X rays by phonons- neutrons by phonons

Unit III Free electron theory, Energy bands and Semiconductor crystals

Energy levels in one dimension-free electron gas in three dimensions-heat capacity of the electron gas-Electrical conductivity and Ohm's law-Hall effect-thermal conductivity of metals-Bloch functions-Kronig-Forder-magnons - antiferro magnetic order - Ferromagnetic domains - Origin of domains.

Unit IV Dia, Para, Ferro and Anti ferro magnetism

Langevin diamagnetism equation - quantum theory of diamagnetism -quantum theory of paramagnetism - Hund rules - Paramagnetic susceptibility of conduction electrons-ferromagnetic order-magnons - antiferro magnetic order - ferromagnetic domains - origin of domains.

Unit V Dielectrics, Ferroelectrics and Super conductivity

Macroscopic electric field - Local field at an atom - Dielectric constant and polarizability - Structural phase transitions - Ferroelectric crystals -Ferroelectric domains - Piezoelectricity - occurrence of superconductivity -Meissner effect - thermodynamics of superconducting transition - London equation - coherence length - BCS theory of superconductivity - single particle tunneling - DC Josephson and AC Josephson effects.

Book for study :

1. Introduction to Solid State Physics, Charles Kittel, Seventh Edition Wiley-India sixth reprint 2007.

Books for reference

1. Solid State Physics -R J Singh, Pearson First impression 2012
2. Solid State Physics-S O Pillai New age international Publishers

Core 9 Microprocessor 8085 and Microcontroller 8051

Unit I Introduction to 8085 Microprocessor

Pin diagram and description - Bus System, Control Signals, Status Signals- Clock System - Latching of Address Bus - Interrupt System - Direct Memory Access- Internal architecture - ALU- Registers organization - Special purpose Registers and Counters - Flags - Program Status Word.

Unit II Programming 8085

Assembly Language Programming - Assembler - Instruction Format of 8085-Instruction Set - Addressing Modes - Instruction Cycle, Machine Cycle and T-Slates - Timing Diagram of Read, Write machine Cycles and some basic Instructions - 8 bit and 16 bit addition and subtraction- Loops and Branching - Multiplication and Division in 8085-Searching and Sorting - Finding smallest/biggest number in an array - Time delay calculation- Stack and Subroutines - Software Interrupts and ISR- Data Transfer Schemes.

Unit III Interfacing and peripheral devices

Address Space of 8085- Address space partition- Memory Interfacing - Memory map and Address decoding- Interfacing of RAM (2K x 8 & 4K x 8) and ROM (2R x 8 & 4K x 8) - I/O mapped I/O and Memory Mapped I/O interfacing Schemes - Ports- Interfacing chips: Nonprogrammable Port 8212 - Programmable Peripheral Interface (PPI) 8255 architecture, Control Signals and operating Modes - Programmable Interval Timer (PIT) 8253 .

Unit IV Micro Controller 8051

Introduction - Comparison of Microcontroller & Microprocessor - Pin Diagram and description - Block Diagram of 8051 and Internal Architecture - Clocks - Registers- Flags- Internal Memory, SFR and I/O Ports - External Memory and decoding- Instruction Set and Addressing Modes of 8051- Features available in 8051: Timer and Counters, Timer Modes - Serial Port and Serial Data Transfer.

Unit V Micro Processor based system design and a Applications

Design considerations - Sensors and Transducers - Sample and Hold Circuits- - Interfacing Keyboard and multiplexed seven segment displays - DAC and ADC interfacing - Square, Rectangular and Ramp Wave Generation - Temperature measurement and control - Digital Clock - Stepper Motor Control.

Books for Study:

1. Fundamentals of Microprocessor and Microcontrollers by B. Ram- Dhanpat Rai Publications, 5th Edition
2. Microprocessor and microcontroller system (First Edition) by Godse and Godse , Technical Publication Pune
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, 2nd Ed. Muhammad Ali Mazidi, Janice G. Mazidi, Rolin D. McKinlay, Pearson India.

Books for Reference:

1. Microprocessor Architecture, Programming and Applications with the 8085, Ramesh S. Gaonkar-4th Ed. Penram International.
2. The 8051 Microcontroller Architecture, Programming and Applications - Kenneth J. Ayala - Penram International Publishing.

Core 10 Numerical Methods and Programming in C++

Unit I Roots of equations and eigen-value problems

Newton-Raphson method. Secant Method. Muller's Method - Lin -Bairstow's Method. Linear Algebraic Equations: Gauss elimination - Gauss-Jordan - Gauss-Jacobi - Inverse of a matrix by Gauss Jordan elimination method.

Unit II Curve Fitting / Interpolation

Curve fitting: Linear Least square fitting - Nonlinear Fit- Fitting a Polynomial Function, Exponential function - Cubic spline fitting – Interpolation: Fundamental theorem of finite difference, Finite difference interpolation with equally spaced: Newton's forward and backward difference formulae - Unequally spaced: Lagrangian interpolation formula.

Unit III Numerical differentiation and integration

Numerical Differentiation : Methods based on interpolation: non uniform & uniform nodal points - Methods based on finite differences: forward & backward difference formulae. Numerical Integration: Trapezoidal Rule, Simpson Rule - Monte-Carlo evaluation of integration. Methods based on undetermined coefficients: Gauss-Legendre, Gauss - Lagurre, Gauss - Hermite integration methods.

Unit IV Solution to ordinary and partial differential equations

Ordinary Differential Equations- Taylor's Series Method- Euler's Method-Euler's modified method - Runge -Kutta 2nd and 4th Order Methods-Predictor- Corrector Methods-Solution to partial differential equations

Unit: V C++ Programming applications

Programme structure: header files, local, global and static variables, input and output statements; Euler's Method: Charging and discharging of a condenser; Runge-Kutta methods: Radioactive Decay; Newton-Raphson method: Solution van der Waals equation; Gauss elimination method: Currents in Wheatstone's bridge; Linear fitting. - least square method : Cauchy's constant; Simpson's and Monte-Carlo methods : Evaluation of (integral) area under the curve; Eigenvalues and eigenvectors of symmetry matrices; Numerical differentiation: Newton's Law of cooling.

Books for Study:

1. M.K.Jain, S.R.K. Iyengar, R.K. Jain, Numerical Methods for Scientific and Engineering computation, 3^r edition, New age international (P) Ltd, Chennai (1998).
2. E.Balgurusamy, Object Oriented Programming with C++, Tata McGraw Hill, New Delhi (2000).

Books for Reference :

1. M.K. Venketraman, Numerical Methods in Science and Engineering 2nd Ed., National Publishing Co., Chennai(2010).
2. E. Balagurusamy, Computer Oriented Statistical and Numerical Methods, Macmillan India Ltd, New Delhi (2000).

Core 11 Field work

Core 12 Practical 3

General Physics Experiments II

Any 5 Experiments

1. Hyperbolic fringes

Determination of Young's modulus, Bulk modulus, Rigidity modulus, poisson's ratio and compressibility of the given material by forming Hyperbolic fringes.

2. Ultrasonic Interferometer

Determination of velocity of ultrasonic sound in the given liquid and compressibility of the liquid.

3. Young's Double Slit

Determination of wave length of the light source or width of the double slit using Laser source for a) standard kit b) lab/custom made double slit

4. Mutual Inductance

Determination of mutual inductance between a pair of coils. Study of variation of mutual inductance for various distances and angles between the coils and determination of coefficient of coupling in each case. Graphical determination of break in coupling for distance and angle.

5. XRD - Crystallographic Parameters

- a) Bragg's Law of Diffraction - derivation,
- b) Definition of Crystallographic Parameters - d-spacing and lattice parameters.
- c) Crystal systems and d-spacing in different crystal systems.
- d) Content of ICDD file (formerly known as JCPDS)
- e) Determination of unit cell dimensions
- f) Crystal parameter for the given XRD spectrums,

6. Optical Fibre Characteristics

Determination of

- a. Numerical aperture and acceptance angle
- b. Attenuation in the fibre and
- c. Loss due to air gaps and coupling.

Core 13 Practical 4
Electronics Experiments - II

Any 5 Experiments

1. Filters

Design and construction of II order Active Filters (Low pass, High Pass and band pass) using IC 741 for a particular frequency - Draw frequency response curve for each case.

2. UJT Characteristics and Relaxation Oscillator

Characteristics study of UJT - construction of a relaxation Oscillator. using UJT to produce the saw tooth wave. Frequency response of the output for various R and C values.

3. Phase Shift and Phase Shift Circuit

Design a Phase shifter circuit using Op-Amp - Measurement of the Phase shift of the input wave for various R and C combinations - Comparison of the experimental output with theoretical values.

4. Digital to Analog Conversion

Construction of Weighted Resistor and R-2R Ladder Network D/A converters using IC 741- Graphing input and output voltages - Resolution Measurement.

5. SCR Characteristics and power control

Characteristics study of SCR - Construction of a power controller device using SCR.

6. Code Converters

Construction of Code converters using ICs - Tabulate input and output for various decimal numbers

- | | |
|--------------------|---------------------|
| a. BCD to Excess-3 | b. BCD to Gray |
| c. Excess-3 to BCD | d. Gray to Excess-3 |

7. Analog Computation.

Solve the given 2 variable simultaneous equations by constructing the Analog computers using Op-Amps.

Sample Eqns. a) $X+2Y = 4$; $2X+Y = 5$ b) $3P + 2Q = 18$; $P + Q = 7$.

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.A. (History)

(Choice Based Credit System)

(With effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem.	Sub 'Pr. No.	Subject status	Subject Title	Hrs/ week	Cre- dits	Marks				
						Maximum			Passing Minimum	
						Int.	Ext.	Tot.	Ex t.	Tot
III	11	Core - 9	History of Later Medieval India 1526 A.D. to 1757	6	5	25	75	100	38	50
	12	Core - 10	Twentieth Century World	6	5	25	75	100	38	50
	13	Core - 11	Constitutional History of England from 1603A.D to 1958	6	5	25	75	100	38	50
	14	Core -12	History of U.S.A. 1865 A.D – 1945	6	5	25	75	100	38	50
	15	Elective - III	Historiography: Theory and Methods	6	3	25	75	100	38	50
IV	16	Core - 13	Modern India with Reference to Freedom Struggle(1757 to1947 A D)	6	5	25	75	100	38	50
	17	Core - 14	Contemporary India Since 1947 A.D	6	5	25	75	100	38	50
	18	Core - 15	Constitutional History of India 1773 to 1950 A.D.	6	5	25	75	100	38	50
	19	Elective - IV	Evolution of Political Thought	6	3	25	75	100	38	50
	20	Project	Individual Project	6	5	50	50	100	38	50

**History of Later Medieval India
A.D. 1526– 1757**

Unit-I

Sources of Mughal History – Literary Sources - Persian, Sanskrit and Regional Languages - Archaeological – Foreign accounts – India on the eve of Babur’s Invasion – Babur – Humayun – Shersha.

Unit – II

Mughal Expansion: Akbar – His conquests – Rajput policy – Religious policy. Jahangir, NurJahan, Shahjahan, War of succession – Aurangzeb – Conquests – Deccan policy – Religious policy –Later Mughals - Decline and disintegration of Mughal Empire.

Unit – III

Rise and fall of the Marathas: Shivaji and his successors – Maratha Mughal relations – Maratha Expansion under Peshwas – Rise of the Peshwas - Balaji Vishwanath - Baji Rao I – Balaji Baji Rao. Defeat of the Marathas. Invasion of Nadir Shah and Ahmad Shah Abdali. Third battle of Panipat.

Unit – IV

Shersha’s Administration – Mughal Administration - Raja Todar Mals Reforms -Mansabdari System – Trade and Commerce - Deccan Policy – Religious policy – Mughal Art, Architecture, Sculpture, Painting. Music, Literature, Foreigners in Mughal court , Court Historians. Society - Economic condition - Agriculture, Industries – Education – Maratha Administration.

Unit – V

Advent of the Europeans: The Portuguese, the Dutch, Danish the English and the French - Trade centers and Ports – Transport and Communication. Competition and Rivalry - Establishment of British Rule in India – Conspiracy of the English, Battle of Plassy.

Books for reference:

1. Arasaratham, S., - Maritime India in the Seventeenth Century.
2. Banerji, A.K., - Aspects of Indo-British Economic relations.
3. Bayly C.A., - Indian Society and the making of the British Empire
4. Barbara D. Metcalf & Thomas R. Metcalf - A Concise History of Modern India
5. Brown Percy, - Indian Architecture Islamic Period.
6. Chaudhuri, K.N., - The trading world of Asia and the East India Company.
7. Dutt, R.C., - Economic History of India in Early British Rule.
8. Irfan Hala, - Agrarian System of Mughal India
9. Irwin, W., - The Army of the Indian Mughal
10. Ranade, M.G., - Rise of the Maratha Power.
11. Sarkar, J.N., - History of Aurangzeb Vol I-V
12. Satish Chandra, - Parties and politics at the Mughal Court 1707-40
13. Sharma H.C.(Ed) - History of Medieval India.
14. Sharma S.R., - Mughal Empire in India
15. Sen, S.N., - Military System of the Marathas.
16. Tripathi, R., - Rise and fall of the Mughal Empire.

Twentieth Century World

Unit – I

Legacy of the 19th Century: First World War – Its Nature - Peace Settlement and Consequences – Russian Revolution – Disarmament – Washington Naval Conference – Locarno Pact – Kellogg Briand Pact – Lenin

Unit – II

League of Nations – Great Depression-Rise of Totalitarian Power–Stalinism–Nazism and Fascism. Japan–Second World War - Surrender of Japan and Germany. New Political Order – Communist Revolution in China.

Unit – III

UNO and World Peace: Cold War Era–Pacts and Treaties–Regional issues: Cuba, Korea, Palestine, Berlin Wall demolition–Arab–Israel conflict, Vietnam Crisis, Kashmir issue, Iraq, Afghanistan .

Unit – IV

Reunification of Germany - Cultural Revolution in China–Mao–Tse – Tung–Reemergence of Japan – Foreign policy of America-NAM, Common Wealth of Nations.

Unit – V

Civil Rights movement in U.S.A. Ending the Era of Apartheid–Nelson Mandela–Disintegration of Socialist Bloc–Change in the Political Order – Bi -polar to Uni- polar. BRICS, G8, G20, WTO.

Books for reference:

1. Carr E.H - The World Between Two World Wars
2. John H. Herz Gwendolen M. Carter - Government politics in Twentieth Century
3. Khemchand Keswani - International Relation in Modern World (1980-1988)
4. Khurana K.L - The Twentieth Century World
5. Malkota Rama.S - International Relation
6. Michael Howard, Roger Louis - Oxford History of Twentieth Century
7. Sri Vastava.L.N - International Relation (from 1914 to present day)
8. Subramanian. N - International Relation.
9. Vidyadher Mahajan - International Relations Since 1914
10. William R. Keyler - The Twentieth Century World

**Constitutional History of England From
A.D. 1603 – 1958 A.D**

Unit – I

The Stuart period-James I and his four Parliaments-Charles I and his first three Parliaments-Petition of Rights-Eleven years Tyranny-Civil war-Long Parliament-Execution of Charles I-The constitutional experiments of Cromwell-The end of Common Wealth.

Unit- II

Restoration - Charles II - Convention Parliament-Cavalier Parliament - Clarendon Code - James II Glorious Revolution of 1688 - Bill of Rights, 1689 – Act of Settlement, 1701.

Unit- III

Parliamentary growth under George I and George II- Origin and Growth of Cabinet system-Emergence of the office of Prime Minister-George III and his Personal rule-Causes for the failure.

Unit – IV

The age of Reforms-Act of 1832, 1867, 1882, 1884, 1885 Parliamentary Act of 1911, Act of 1918, Act of 1928.

Unit – V

Constitutional Changes during Second World War-War Cabinet - Statue of West Minster-Abdication of Edward VIII - Reorganization of Judiciary during 19th and 20th Centuries - Party System-House of Commons-House of Lords - Decline of House of Lords - Commonwealth of Nations.

Books for reference

1. Adams, George Burton – Constitutional History of England, Jonathan Cape, London, 1971
2. Keir D.L. – Constitutional History of Modern Britain
3. Krishnamurthy. V.M. – Constitutional History of England, 1603-1960 A.D. Vol. II, Vijayalakshmi Publications, Neyyoor, 1973.
4. Mahajan, V.D. – England since 1485, Sultan Chand and Sons, New Delhi, 1974
5. Maitland, F.W – Constitutional History of England, Cambridge University Press, Cambridge, 1961.
6. Sachdeva and Gupta – British Constitutional History, Ajanta Prakashan Publishers, Delhi, 1983.
7. Sinha, J.P – Constitutional History of England, Kendar Nath Ramnath Publishers, Meerut, 1978.
8. Theodore F.T. Plucknett – English Constitutional History, Sweet and Maxwell Ltd., London, `1960.
9. Venkatraman, T.K. – Constitutional History of British Vol. II, Jeyam and Company, Madras, 1958

History of USA
A.D. 1865 – 1945 A.D.

Unit- I

Civil War – Causes, Course, Results, Significance – Abraham Lincoln – Post Civil War Reconstruction - Agricultural Expansion – Rise of Big Business – Labour Movements.

Unit – II

Growth of Imperialism – Sherman Anti – Trust Act of 1890 - Spanish American War – Annexation of Hawai - Philippines and Caribbean – Pacific problems.

Unit – III

Rise of progressivism – Theodore Roosevelt - Square Deal – domestic policy – Big Stick diplomacy – Taft administration and Dollar Diplomacy.

Unit – IV

Woodrow Wilson and Liberalism–New Freedom – New Diplomacy and Foreign policy – Role of America in the First World War - The Fourteen points of Wilson – Great Depression and its effects – Hoover administration.

Unit – V

Franklin D. Roosevelt – New Deal – America and the Second World War – War time Conferences – Establishment of UNO – Resurgence of USA as World Power.

Books for reference:

1. Hill.C.P. – A history of United states, Arnold Honimann publishers, New Delhi, 1976.
2. John.A. Krout – United States Since 1865, Barners and Noble publishers, New York 1966
3. Krishnamurti V.M – History of U.S.A
4. Marshal Smelser – American History at a Glance, Barners and Noble, New York, 1966.
5. Sharma Mahmood – The History of United States, Pearson publications, Delhi,2012
6. Subramanian.N – A History of United States, Madurai Publishing house, Madurai, 1981.

Historiography: Theory and Methods

Unit I

Meaning of History: Definition- Scope and Purpose- Art or Science - Kinds of History- Relation with other disciplines-Uses ,lessons and abuses of History.

Unit II

Theories and Concepts : Causation and Change –Cyclical theory –Great man theory , Theory of Repetition , Theory of Progress-Historical Materialism-Historical Determinism - Positivism , Historicism.

Unit III

Writing on History: Greek ,Herodotus and Thucydides –Roman, Livy and Tacitus-Church ,Eusebius of Augustine - History in Renaissance Age, Machiavelli - History in Enlightenment Era, Gibbon- Scientific History, Ranke and Toynbee-History writing in Ancient India , Kalkana, Medieval India, Alberuni and Barani, Modern India Sarkar and Sastri.

Unit IV

Historians and classical works: Orientalist :Sir William Jones , Imperialist: James Mill, Nationlist: Bhandarkar, Marxist: D.D.Kosambi, Romila Thapar, BipanChandra, IrfanHabib, Sabaltem studies: Ranajit Guha, Annals school, Marc Block, Postmodernist, Derrida.

Unit V

Methods and Tools: Forms and Types of Research- Requirements of a research scholar- Choosing the subject of research – Hypothesis- Collection of Date- Analysis of Data - Criticisms – Synthesizing - Presentation of Thesis, Foot-notes –Documentation –Bibliography, Appendix ,Glossary and Index.

Books for reference

1. Carr E.H - What is History.
2. Collingwood R.G. - The Idea of History.
3. Khurana K.L. - Concept and methods of Historiography.
4. Manickam S. - Historiography and Research Methodology.
5. Rajayyan K. - The History in Theory and Method.
6. Rowse A.L. - The Uses of History.
7. SubramanionN. - Historiography.
8. Sydney Hook - The Hero in History.
9. Sridharan - A Text Book of Historiography.

**Modern India with Reference to Freedom Struggle
(A.D 1757. to A.D 1947)**

Unit – 1

Stages of Colonialism, Imperialism, Capitalism – Nationalism – Resistance of Indian rulers and chieftains – Various peasant and Tribal uprisings and Military Revolts.

Unit – II

Introduction of Western Education – Socio – Religious Reforms Movements – Role of the Press and Indian Awakening – Pre – Congress Associations – Formation of the Indian National Congress, 1885.

Unit – III

Constitutional Methods of Agitation: Moderation and Extremism – Drain of wealth – Appeals, Resolutions and Petitions – Role of Congress Leaders – Popular Methods of Agitation – Partition of Bengal 1905 - Swadeshi and Boycott movements – Split in the Congress – Rise of Militant Nationalism.

Unit – IV

Rise and Growth of Home Rule Movement – Revolutionary Movement : Maharashtra, Bengal and Madras – Press and Literature in Bengal – Role of Shyamji Krishna Verma, V.D. Savarkar, Madam Cama, M.N Roy, M.P.T Acharya – Alipur Conspiracy – Maniyatchi Incident – The Gaddar Party – Udham Singh and Bhagat Singh.

Unit – V

Gandhian Era: Gandhi's Entry into Politics – Non-Co-operation Movement - Chauri – Chaura Incident – Swarajist Party – Motilal Nehru – Simon Commission, Nehru Report – Jinnah's 14 points (1929) – Civil Disobedience Movement (1930-34) – Gandhi – Irwin Pact (1931) – Communal Award – Poona Pact – Cripps Proposals – Quit India Movement (1942) – Muslim League and Demand for Pakistan – CR Formula – Subash Chandra Bose & Indian National Army – Towards Freedom.

Books for reference:

1. Agarwal, R.C., - National Movement and Constitutional Development in India.
2. Ahluvalia, H.M., - Freedom Struggle in India 1857-1909
3. Bipin Chandra, - Communalism in India
4. Bipin Chandra, - India's Struggle for Independence 1857-1947
5. Ghose, K.K., - The Indian National Army
6. Gopal.S., - The British Policy in India 1858-1905
7. Gupta, D.C., - Indian National movement
8. Majumdar, R.C. - History of Freedom Movement in Bengal, Vols. I & II
9. Pattabhi Sitaramayya, - History of Indian National Congress, Vols. I&II
10. Rajayyan.K. - South Indian Rebellion 1800 - 1801
11. –do- - Freedom Struggle in India

**Contemporary India
Since 1947**

Unit – I

Partition of British India: Demand for Pakistan – Post Independent India – Resettlement and Repatriation Problem – Integration of Princely States : Kashmir, Hyderabad and Junagadh – Role of Vallabhai Patel – Republic of India – General Elections - Party System.

Unit – II

India's Foreign Policy: Its Basic Concepts – Panchasheela and Non Alignment – India and its Neighbours: Indo- Pak Relations – Indo- Sri Lankan Relations – Indo – Bangladesh Relations and Indo – China Relations : India and the UNO, Commonwealth, SAARC, NAM – Indo - US and Indo – Russian Relations – India and Disarmament.

Unit – III

Economic Development : Planning in India – Five year Plans and Annual Plan – NITI Aayog – Welfare Programs of the Government – IRDP, Jawahar Rozgar Yojna, etc – Growth of Education: Radhakrishnan Commission – Al Mudaliar Commission – Kothari Commission – Acharya Ramamurthi Commission – etc., National Literacy Mission – New Educational Policy (1986) – Navodaya Schools and Kendriya Vidyalayas.

Unit – IV

Development of Science and Technology : Atomic Energy Commission (AEC) and its Programs – Indian Space Research Organization (ISRO) and its Programs – Defence Research and development Organisation (DRDO) and its Programs – Missile Technology and its development – Bio Technology – Green, White and Blue Revolutions. Development of Communications – Railways, Roadways, Airways.

Unit – V

Makers of Contemporary India : Nehru, Patel, Indira Gandhi, CV Raman, Radhakrishnan, Visveswarayya, H.J. Bhaba, Vikram Sarabhai, H.N. Sethna, Shanthi Swarup Bhatnagar, B.C. Roy, M.S. Swaminathan, Vargheese Kurian and A.P.J. Abdul Kalam.

BOOKS FOR REFERENCE:

- | | | |
|-------------------|---|--|
| 1. Basu D.D. | – | Introduction to Indian Constitution |
| 2. Bipan Chandra | – | India after Independence 1947-2000 |
| 3. John Gilbert.G | – | Contemporary History of India |
| 4. Pylee.M.V., | – | Indian Constitution. |
| 5. Pail R. Brass | – | The Politics of India Since Independence |
| 6. Rajani Kothari | – | Politics in India |
| 7. Sumot Sarkar | – | Modern India |
| 8. Sobitha Bai | – | Contemporary History of India 1947-2009 |

Constitutional History of India

A.D. 1773 to A.D 1950

Unit – I

Formation of English East India Company - British Parliament's intervention in Company's Affairs - Regulating Act of 1773 - Pitt's India Act of 1784.

Unit - II

Charter Acts of 1793, 1813, 1833, 1853 - Crown's take over of the Indian Government – Transfer of Power Act of A.D. 1858 –Defects. Proclamation of Queen Victoria – Importance. The Indian Councils Act of 1861 and 1892.

Unit – III

Minto - Morley Reforms Act of 1909: Circumstances leading to the Act of A.D. 1909, Provisions – Assessment of the Reforms - Communal Electorate - Defects - Montague - Chelmsford Reforms Act of 1919: Circumstances leading to the act – Provisions - Governor General and his Executive - Central Legislature – Changes in the Provincial set up–Dyarchy - Working of Dyarchy - Failure of Dyarchy.

Unit – IV

Government of India Act of 1935: Salient Features – All India Federation - Home Government, Federal government - Provincial government : Provincial Autonomy- Defects of the Act - Estimate. The functioning of the Congress ministries formed after the Government of India Act, 1935 – Constitutional development of India from AD. 1939 - 47.

Unit - V

Impact of the Second World War on Constitutional Development - Cabinet Mission - Constituent Assembly - Mount Batten Plan - Attlee Declaration - Indian Independence Act – Making of the Constitution – Foundations of Indian Constitution. The Union and the States. .

Books for reference :

1. Agarwal A.C. - Constitutional History of India.
2. Appadurai - Dyarchy in Practice.
3. Keith A.B. - Constitutional History of India.
4. Khurana K.L. - History of India from 1526 to 1967 A.D.
5. Mahajan V.D. - History of Freedom Struggle and Constitutional Development.
6. Sharma L.P. - Indian National Movement and Constitutional Development.

Evolution of Political Thought

Unit-I

Nature of Political Thought : Origin of State – Concept-Functions- Sovereignty in the State – Code of conduct of the state – The Theory of Divine Origin of State, and the Theory of Force and the Evolutionary Theory.

Unit-II

Greek and Roman Political Thought: Socrates – His teachings – Plato – His political ideas – Importance – Aristotle – Father of political Science . Roman Political Thought: Contribution of Romans to European Political Thought – Growth of Roman Legal system – Roman Political Thinkers : Polybius – Cicero – Seneca – Marcus Aurelius.

Unit-III

Medieval Political Thought : Influence of Christianity on the growth of Political Thought- Political Ideas of St. Augustine , St . Ambrose – His Political Philosophy, St. Thomas Aquinas – His Political Ideas – View on Law , Justice and Contribution to Political Thought . Medieval Secularism.

Unit-IV

Modern Political Thought : Machiavelli – Writings – Political views about state – Father of Modern Political Thought . Thomas Hobbes – Views about Sovereignty – Secularism , Natural Rights – Liberty and law – Hobbes Political Philosophy – Importance. John Locke – Theory of Separation of powers – Natural Rights and Natural laws. Montesquieu – Views on laws , Forms of Government, Social Institutions and Slavery . Rousseau – Writings – Philosophy – Utilitarian. J.Bentham – Moral Philosopher – Political Philosopher – Reformer .

Unit-V

Indian Political Thought : Gandhi - His Contribution - Ram Mohan Roy – Social Liberalism – Vivekananda – His Political Thought – Sri Aurobindo – Political Philosophy – M.N.Roy – Communist thought – Ram Manohar Lohia – Socialist thought.

Books for reference :

1. Archibald William Bunning - Political Thought
2. Bandyopadhyay - Ma-Tse- Tung and Gandhi
3. Bandari B.R - History of European Political Philosophy .
4. David M.Lieuman - Marxism After Marx .
5. Ebenstin - Great Political Thinkers .
6. Emile Burns - What Is Marxism .
7. Herbert A Deane - The Political Ideas of Laski .
8. John H.Hallowe - Main currents of Modern Political Thought .
9. Lancaster - Masters of Political Thought .
10. Mukhi.H.R - History of Western Political Thought
11. Selvaraj. C - Historiography .
12. Varma.V.P. - Modern Indian Political Thought.

MSU / 2016-17 / PG –Colleges / M.A.(History) / Semester -IV / Ppr.no.20 / Project

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.A. (Economics)

(Choice Based Credit System)

(With effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem	Sub Pr. No.	Subject status	Subject Title	Hrs/ week	Cre- dits	Marks				
						Maximum			Passing Minimum	
						Int.	Ext	Tot.	Ext.	Tot
III	11	Core - 9	Economics of Growth and Development	6	5	25	75	100	38	50
	12	Core - 10	Public Economics	6	5	25	75	100	38	50
	13	Core -11	Research Methodology	6	4	25	75	100	38	50
	14	Core -12	Financial Economics	6	4	25	75	100	38	50
	15	Elective -III	Human Resource Management/ (or) Econometrics	6	4	25	75	100	38	50
IV	16	Core - 13	Environmental Economics	6	5	25	75	100	38	50
	17	Core - 14	Health Economics	6	5	25	75	100	38	50
	18	Core - 15	Economics of Micro Finance	6	4	25	75	100	38	50
	19	Elective - IV	Demography/ Economics of Infrastructure	6	4	25	75	100	38	50
	20	Project	Project	6	5	50	50	100	25	50

Economics of Growth and Development

Unit I: Development and its Components: -

Defining Economic Development – Importance of the study of Economic Development– Obstacles to Economic Development – Determinants of Economic Development - Measurement of Economic Development: GNP, GNP per capita, Welfare and Social Indicators – Human Development Index: Meaning and its components – PQLI – Effects of Population Growth on Economic Development. Measuring Poverty: Head count and Poverty gap– Characteristic of Poverty groups: Rural Poverty and Women and Poverty– Functional Impact of Poverty.

Unit II: Theories of Growth: -

The Harrod-Domar Model – Steady Growth Model of Meade - Solow Model of Long Run Growth - Pasinetti Model of Profit and Growth – Joan Robinson’s Model of Capital Accumulation — Fel’dam Model - Kaldor’s Model of Growth – The Models of Technical Change – Growth Accounting: Solow’ s, Denison’s and Jorgenson-Griliches’ sources of growth.

Unit III: Theories of Development: -

Keynesian Theory – The Marxian Theory - Lewis Theory of Unlimited supplies of labour – Fei and Ranis Theory of Utilization of Surplus Manpower - Leibenstein’s Critical Minimum Effort Thesis – Big-Push Theory – The Doctrine of Balanced Growth – The concept of Unbalanced Growth -

Unit IV: Sectoral Aspects of Development: -

Role of State in Economic Development - Agriculture and Economic Development– New Technology and sustainable Agricultural Growth – Industrialization and Economic Development – Complementarities between Agricultural and Industry - Monetary Policy for Economic Development - Role of Fiscal Policy in a developing country – Role of Public Enterprises in the Economic Development - Pricing Policy and Economic Development – Effects of International Trade on Economic Development - NIEO: Objectives and various programs.

Unit V: Resource Allocation, Planning and Development: -

Need for Investment criteria in developing countries – Factors determining mobilization of financial resources Economic Planning: Principles and Problems) – Allocating Investment Resources: Traditional Approach and Specific Investment Criteria for LDCs - Manpower Planning: Meaning and objectives – Methodology of Manpower Planning – Manpower Problems and Manpower Planning in LDCs.

Books for References: -

Jhingan M L., Economics of Development and Planning,
Taneja and Myer, Economics of Development and Planning
Michael P.Todaro Economic Development in the third world, Longman Publishers

Public Economics

Unit I: The Theory of Public and Private Goods:–

Efficiency of Public Goods – Private preference for Public goods –Voluntary Exchange Theory –Samuelson Theory-Externalities –Negative Externalities –Positive Externalities and inefficiency.

II: Allocation of Resources:–

Opportunity cost and Allocation - Efficient Allocation of Resources –Optimum Budget.

Unit III: Taxation and Public Expenditure: –

Sources of Revenue –Kinds –Direct and Indirect Tax –Merits and Demerits –Income Tax –Progressive –Regressive –Degressive Tax –Double Taxation - **Public Expenditure:** Canons of Public Expenditure – Reasons for the growth of Public Expenditure -Wagner’s views on Public Expenditure –Peacock – Wiseman Hypothesis –Samuelson and Musgrave Approach –Colinclark Hypothesis.

Unit IV: Public Debt: –

Meaning –Causes –Classification - Sources -Burden – Kinds of burden - Measurement of Debt Burden –Redemption of Public debt - Budget in India –Process –Procedure –Purpose of Budget –Types –Revenue and capital Budget –Performance Budgeting –Principles of Budget - Deficit Financing –Meaning –Methods – Effects –Limitation –Deficit Financing in India.

Unit V:Federal Finance: -

Allocation of Revenue -Resources between Centre and States –Division of Functions – Division of Resources – Central Resources – State List –Finance Commission –Functions – Major Recommendations of 12th and 13th Finance Commission - Local Finance –Meaning and Importance –Sources for Finance for Local Governments –Role of Panchayat Raj –Gramsabha – Municipalities and Municipal Corporations.

Books for references:

1. Lectures on Public Economics, Atkinson, A.B and J.E.Siglitz (1980), Tata McGraw Hill, New York
2. Public Finance and Public Choice, John Cullis and Philip Jones, Oxford University Press Ist Edition, 1998
3. Public Finance in Theory and Practice, R.A.Musgrave and P.B.Musgrave, R.A.Musgrave and P.B.Musgrave, McGraw Hill Publications,5thEdition ,1989
4. Public Finance, B.P.Tyagi Revised by Dr.H.P.Singh, Jai PrakashNath& Co
5. Public Finance, Harvey Rosen, McGraw Hill Publications, 7thEdition, 2005
6. Public finance, Its theory and working in India, Bhargava (2004), Chaitanya Publishing House
7. Public Economics, Myles, G New York, NY: Cambridge University Press, 1995. ISBN: 0521497698.

Research Methodology

Unit I Foundation of Research -The Scientific Approach – Aims of Social Sciences – Scientific Revolution – Role of Methodology – Research Process – Conceptual Foundation of Research – Economic Theory and Method – Axiomatic, Mathematical and Historical Methods – Theory, Models and Empirical Research – Basic Elements in Research – Identification of a Research Problem –Objectives of research-motivation in research-types of research-criteria of a good research-defining a research problem-selecting a problem-review of literature

Unit II Research design-need for research design-different types of designs-experimental design-Sampling design-census and sample survey –steps in sampling design-criteria for selecting a sampling procedure-characteristics of a good sampling design- how select a random sample-Hypothesis formulation and testing – Research Process

Unit III Measurement and scaling techniques-Measurement in research-sources of error in measurement tests-scaling –important scaling techniques

Unit IV Data Collection Methods

Principles and Process in Data Collection – Primary Data – Case Study Method – Survey Research — Preparation of Structure Interview Schedule – Construction of Questionnaire – Pilot Study – Classification and Tabulation – Diagrammatic Representation – Secondary Data – Sourcing of data - Processing and analysis of data and interpretation

Unit V Report writing-significance of report writing-different steps in writing report-layout of research report-mechanics of writing a research report- referencing systems-research, Policy Making and Advocacy and Activism- influencing policy making-through debates, newsletters, networking with policy makers, - Advocacy and Activism- Skills needed for Advocacy and Activism- Presentation of Research findings-presentation skills –use of published research for policy making and advocacy.

Book for Reference

- 1.C.R. Kothari, Research Methodology, Wiley Eastern Limited
- 2.C.T. Kurien, A Guide to Research, Sage Publishers.
3. Chavanachimias and David Nachimias, Research Methods in the Social Services.
4. Herbert Wesberg and brew D. Bower, An Introduction to Survey Research and Data Analysis, W.H. Freeman and Company

Financial Economics

UNIT I Nature and Role of Financial system

Money and finance – money and near money – financial intermediation and financial intermediaries – the structure of the financial system – functions of the financial sector – indicators of financial development – equilibrium in financial markets – financial system and economic development - criteria to evaluate assets : risk and financial assets – types of risk – return on assets, risk – Return Trade off – Valuation of securities

UNIT II Structure of interest rates

Theories of interest rate determination – level of interest rates – long period and short period rates – term structure of interest rates – spread between lending and deposit rates – administered interest rates – appropriate interest rate policy

UNIT III Non-bank financial Intermediaries

Definition and types of non-bank financial institutions : Their growth and impact on India's economic development, measures taken to control their operations

UNIT IV Financial markets

Role and structure of money market and capital market – call money market. Treasury bill market, commercial bill market including commercial paper and certificate of deposits, discount market – government securities market – markets for derivatives : futures and options, and other derivatives : types, uses and pricing of derivatives – primary and secondary market for securities ; SEBI : its impact on the working of capital market in India ; IRDA and its role in financial markets

UNIT V International Financial Markets

Nature, organization and participants – exchange rates – devaluation and depreciation – working of floating exchange rates since 1973 – risk hedging and futures in exchange rates – international financial flows, forms and volume – rise and fall of Brettonwood institutions – international liquidity – Reforms in international monetary system for developing countries – lending operation of World Bank and its affiliates – working of IDA and IFC. Growth of regional financial institutions. Asian Development Bank and its lending activities; Asian Development Bank and India. Euro-dollar and Euro currency markets : their developmental role and regulation at the international level

REFERENCE BOOKS:

1. M.A. Shakila Banu, Finance and Securities Market in India, Abhijeet Publications, Delhi, 2011.
2. L.M.Bhole & Jitendra Mahakud, Financial Institutions and market, Tata McGraw Hill, New Delhi, 2011.
3. D.M.Mithani, The Economics of Global trade and Finance, Himalaya Publishing House, Mumbai, 2007.
4. V.A.Avathani, International Finance, Himalaya Publishing House, Mumbai, 2011.
5. Robert Bruner, Case Studies in Finance, Tata McGraw Hill, New Delhi, 2006.
6. Giancardo Gandolf, International Finance in Open Economy, Micro Economy, Springer Publishing House, New York, 2006.

Human Resource Management

Unit I

Evolution of human resource management – The importance of the human factor – Objectives of human resource management – Role of human resource manager – Human resource policies.

Unit II The concept of best fit employee

Importance of Human Resource Planning – Forecasting human resource requirement – Internal and External sources. Selection process screening – Tests - Validation – Interview – Medical examination – Recruitment introduction – Importance – Socialization benefits.

Unit III Training and executive development

Types of training methods purpose benefits resistance. Executive development programmes – Common practices - Benefits – Self-development – Knowledge management.

Unit IV Sustaining employee interest

Compensation plan – Reward – Motivation – Theories of motivation.

Unit V Performance evaluation

Method of performance evaluation – Feedback – Industry practices. Promotion, Demotion, Transfer and Separation – Implication of job change.

Books for reference

1. Decenzo and Robbins, Human Resource Management, Wiley, 8th Edition, 2007.
2. Dessler Human Resource Management, Pearson Education Limited, 2007
3. Mamoria C.B. and Mamoria S. Personnel Management, Himalaya Publishing Company, 2007
4. Bernadin , Human Resource Management ,Tata Mcgraw Hill ,6th edition 2006.
5. Eugence Mckenna and Nic Beach, Human Resource Management, Pearson Education Limited,2007.
6. Wayne Cascio,Managing Human Resource, McGraw Hill,2007
- Ivancevich,Human Resource Management, McGraw Hill

Econometrics

UNIT – I CONCEPTS & METHODOLOGY

Definition and Scope : Introduction – Origin, Definition, Objectives, characteristics and scope of econometrics, some basic concepts of econometrics, limitations of econometrics – specification bias - Tools of the study – Methodology of econometric Research –Economic models – Economic and econometric models – Time series model and cross section model.

UNIT II BASICS OF ESTIMATION

Estimator – Estimation – Properties of estimators – small sample properties of estimators – large sample properties of estimators – OLS and maximum likelihood method – statistical properties of least squares estimators - Assumptions of OLS.

UNIT III SIMPLE REGRESSION ANALYSIS The simple regression model – Estimation of Linear and non- linear regression lines - importance of the BLU properties. The Gauss-Markov theorem – hypothesis testing – Goodness of fit (R^2) – ‘t’ Test - ‘F’ Test - Reporting the results of regression analysis – applications (Numerical Problems)

Unit IV: Multiple Linear Regression Model:

Multiple Linear Regression Model – Matrix formulation – Least squares Method of Estimation – Testing of coefficient of determination.

Unit V: Qualitative Independent and Dependent Variable

Regression on dummy independent variables – Regression on dummy dependent variables – Linear Probability Model – Logit Model – Probit Model and Tobit Model.

REFERENCE BOOKS :

1. Econometrics : Theoretical foundation and empirical perspectives, Dilip Nachane, Oxford University Press, 2006.
2. Koutsoyiannis, Theory of Econometrics, S.Chand & Co, New Delhi, 1978.
3. Johnston- Econometric Methods (3rd Ed.) McGraw Hill 1985.
4. R.C.Pindyock and D.L.Rubinfeld – Econometric Models and Economic Forecasts, 1988.
5. S.P.Singh, H.P.Singh & Anil K Parashar, Econometrics, S.Chnad & company, New Delhi, 1991.
6. Apte.P. G. - Text Book of Econometrics (1999) Tata McGraw Hill.
7. D.Gujarati – Basic Econometrics, Tata McGraw Hill, New Delhi, 2010.
8. Rakesh Jalal, Structures of Econometrics, Cyber Tech Publications, New Delhi, 2012.
9. Introductory Econometrics, Barreto , Cambridge University Press, (ISBN-9780521132589)

Environmental Economics

Unit I: Environmental Economics

Introduction to resources and Environment in Economic Theory-Classification of resources - Emergence of Resource and Environment Economic Theory - Material Balance Principle

Unit II: Efficiency and Market Failure

Environmental resources - Scarcity and choice - Economic efficiency; Efficient allocation; Efficiency in consumption production and product run efficiency; Social Welfare Function and Optimality; Inter – temporal efficiency; Optimal allocation and a market Economy - Market Failure and Public Policy - Externality and Public Goods - Externality and Economic Efficiency

Unit III: Harvesting renewable and non-renewable resources: -

Simple optimum resource depletion model - Resource extraction in perfect competition and monopolistic market - Dynamics of resource harvesting - Socially optimal resource harvesting -Economics of Forestry – Conservation of resources.

Unit IV: Pollution and depletion of quality and quantity of environmental resources: -

Classification of forms of pollution - Nature of emissions-Damage relationship-Zone of influence –Degree of atmosphere mining-Mobility of emission sources-Efficient level of pollution -Pollution abatement - Issues in economics of pollution – Technological progress, Minimum Standard of Conservation

Unit V: Environment and Economic Policy: -

Coase theorem - Economically efficient and cost effective pollution abatement programs - Forms of direct regulation (tax, subsidies, and permits) Economic growth and natural environment Population Growth, Economic; International and Global Environmental Population Problems – Sustainable Economic Development.

Books for reference

1. Roger Pearman&Yuema - Natural Resource and Environmental Economics - 1995Longman
2. Nick Hanley, Jason F Shogren, Ben White, 1999; Environment Economics in Theory andPractice – Mac Millan
3. Partha Das Gupta and Karl – Goral Maler – 1997; The Environment and emerging Development Issues – Vol 1
4. Allan Randal-Property Rights. Efficiency and the distribution of Income – Resource EconomicsSecond Edition - John Wiley and Son
5. Climate change in Asia and Pacific, Venkatachalam Anbumozhi, Sage Publications
6. Prasad Modak and Asit. K. Biswas, 1999 - Environmental Impact Assessment for DevelopingCountries - Oxford University Press.
7. Environmental Valuation in South Asia,Haque,Cambridge University Press (ISBN-9781107007147)
8. World Development Reports.

Health Economics

Unit I: The National and International Health Scene: -

Health output and input indicators and their correlation with the level of economic development and with the public expenditure on health. Growth of Allopathy, Homeopathy and Indian Traditional Medicine –Educational Institutions in India –Hospitals in Rural and Urban India –Measures taken by Government. A review of the Indian National Health Policy

Unit II: Resource Allocation in the Health Sector: -

Resource allocation problems in private and Government Hospitals –The problem of multiple services of a hospital -Pricing of these services and the choice of the mix of services –The tradeoffs between quantity and quality -Production Function ,productive efficiency and equity considerations applied to the hospital sector, spatial distribution of health care facilities and services –The demand for health services and the role of physician –The pharmaceutical companies - health insurance.

Unit III: Evaluation of Benefits and Cost of Health Services:

Private benefits and private costs of providing health services –The failure of the market to provide essential health services –The provision of Health services by the Government – The application of benefit cost analysis to public Health and Family Planning projects-The role of Health in economic development –Value of output lost due to number of sick days –Benefits and costs (both private and social) of training to professional manpower such as physicians –dentists, pharmacists, nurses.

Unit IV: Financing of Health Services: -

A review of per capita and public expenditure on Health services over time and in different parts of the country –An Analysis of the sources (public) finance for health –The need for a general health insurance – the need for a special insurance for the poor ,disabled and the aged –A comparative analysis of alternative payment system, prepayment scheme – saving linked direct insurance system etc. Financing health service through specific (Health Cess) and general (direct and indirect taxes) - The role of financing institutions in financing health services

Unit V: Health Care in India: -

Role of NGOs – Health Policy in India.

Books for reference:

1. Banerjee, D. (1975), social and Cultural Foundations of Health Service Systems of India, Inquiry, Supplement to Vol. XII, June.
2. Banerjee, D. (1982), Poverty, class and Health Culture in India, Vol. I ParchiPrakashan, New Delhi.
3. Gandhian Institute for rural and Family Planning (1972), studies on Mortality in India, Monograph Series No. 5.
4. Government of India (1983), National Health Policy, New Delhi.

5. Indian Council of Social Science Research and Indian Council of Medical Research (1981), Health for All 2000 a. D. ICSSR, Delhi.
6. Madan, T. N. (1969), Who Chooses Modern Medicine and Why, Economic and Political Weekly, pp. 1475-84.
6. Madan, T. N. (1980), Doctors and Society –Three Asian Case Studies, Vikas Publishing House, Delhi.
7. Naik, J. P. (1977), An alternative System of Health Care services in India – Some Proposals, ICSSR, Delhi.
8. Feldstein, M. S. (1977), Economic analysis of Health Service Efficiency, North Holland, Amsterdam.
9. Jimenez E. (1987), Pricing Policy in the Social Sectors, The Johns Hopkins University Press, New York.

Economics of Micro Finance

Unit I: Fundamental Concepts

Microfinance – Meaning - The goals of Microfinance – Key Operating Principles of Microfinance – Evolution of Field of Microfinance - Financial Management in Households – Effective Savings and Credits – Microcredit Methodologies : Self-Assessment – Credit Products and Methodologies – Effective Methodologies – Comparison Methodologies – Tailoring Delivery – Why Adaptation is Important?

Unit II: Policy Environment

Effects of the Local Environment: Self-Assessment – Economic/Social Policy Environment – Regulation and Supervision

Unit III: Financial Statements

Reading Financial Statements: Balance Sheets – Income Statements – How They Relate? - Measuring Delinquency: The Portfolio and the Portfolio Report – Why Measure Portfolio Quality? – Measuring Portfolio Quality – Effect of Loan Loss Provisions and Write-Offs – Maintaining High Portfolio Quality - Key Financial Factors: Financial Projections: Khaled's Example – Factors Affecting Income – Factors Affecting Expenses – Factors Affecting Growth.

Unit IV Interest Rate Practices:

Charging Commercial Interest Rates – Types of Interest Rates – Estimating Annualized Effective Interest Rates – Pricing Structures - Measuring Financial Viability: Myth or Fact? – Adjustments – Ratios – Trends.

Unit V: Institutional Analysis: -

Gauging Institutional Viability – Components of Institutional Viability – Some Measures of Institutional Health - Donor/MFI Relations - An Institutional Perspective – An Effective Funding Relationship.

(Optional----A student will have to put in atleast 25 hours of internship in any one of the Microfinance institutions in the jurisdiction of the university during free time.)

Text Book:

1. Microfinance Perspectives and Operations 2nd editions, IIBF, Macmillan Publishers
(paper back)

Economics of Infrastructure

Unit I Pricing

Infrastructure and Economic Development — Infrastructure as a Public Good: Social and Physical Infrastructure - Characteristics of Public Utilities The case for Nationalization The peak load problem and the dual pricing controversy, marginal cost pricing in public utilities - Electric power system – Pricing of electric power.

Unit II Transport Economics

The structure of transport cost and the location of economic activity-cost functions in the transport sector Pricing Principles-Cost Benefit Analysis in the Transport Sector-Demand for Transport, Special problems of individual modes of transport; Inter-Modal coordination in the Indian Context - Ports - The rationale of Government Intervention in the Government Sector

Unit III Communication

Rate making in the Telephone Utilities – Decreasing Cost principle in the telephone Industry Characteristics of postal services – Private sector participation in communication.

Unit IV Energy and Economics

Energy and Economic Development-factors determining demand for energy-Effects for energy shortages - Conservation of Energy-renewable and non-conventional sources of energy - Energy modeling – Search for an optimal energy policy - Indian Context

Unit V Social Infrastructure

The concept of social infrastructure - Financing and Organisation of the social services – Private Vs Public Sector financing – Pricing of Social Services - Specific Social Infrastructure - Health Insurance – Education Approaches to Educational Planning – Rate of return and Manpower Balances Approach – The New Education Policy – General and Specific training of Human Resources

Books for reference

- 1.BK Mathur – Public Enterprise Ryan and Pearce 1989 - Price Theory and Applications- Macmillan India Ltd.
- 2.Robert Dorfman – 1979 - The Price System — Prentice Hall of India
- 3.Donald N McCloskey - The Applied Theory of Price - Macmillan, London
- AP Thirlwall – 1998 - Growth and Development Macmillan
- 4.. Nanjundappa - Economics of Transport India Infrastructure – Oxford University Press (Revised Edition)
5. Allan Randall-Resource Economics - II Edition – Wiley and Son
- India Infrastructure report-Revised Issues
- 6.Higher Education reform in India – 1993 - Suma Chitnis and Philip Altbach Sage - New Delhi

Demography

Unit I: Meaning And Scope Of Demography: -

Components of population growth and their inter-dependence. Measures of population change; structure, distribution and sources of population data; Theories of population – Malthus, Optimum theory of population; Theory of demographic transition – Views of Meadows, Enke and Simon; Population and development.

Unit II: Structure of Population: -

Population trends in the twentieth century; Population explosion – Threatened or real, distant or imminent : International aspects of population growth and distribution, Pattern of age and sex structure in more developed and less developed countries; Determinants of age and sex structure, Demographic effects of sex and age structure, economic and social implications; Age pyramids and projections – Individual aging and population aging.

Unit III: Fertility, Nuptiality and Mortality:-

Importance of study of fertility – Total fertility rate, Gross reproduction rate and net reproduction rate; Levels and trends of fertility in more and less developed countries; Factor affecting fertility

– Socio – economic factors, economic status, health, education, nutrition, caste, religion, race region, rural-urban and status of husband and wife; Nuptiality – Concept and analysis of marital status, single mean age at marriage; Synthetic cohort methods; Trends in age at marriage; Mortality – Death rates, crude and age-specific; Morality at birth and infant mortality rate; Levels and trends in more and less developed countries; Sex and age pattern of mortality; Factors for decline immortality in recent past; Life table –Construction and uses; Concepts of stable population; Methods of population projection.

Unit IV: Migration and Urbanization:-

Concept and Types – Temporary , internal and international; International migration – Its effect on population growth and pattern; Factors affecting migration; Theories of migration related to internal migration; Urbanization – Growth and distribution of rural – urban population in developed and developing countries.

Unit V: Demographic Data Base in India: -

Study of census in India – Methodology and characteristics of census; Nature of information collected in 1971, 1981, 1991, and 2001 census in India; National Family Health Survey 1 and 2 and Rapid Household Survey; Changing characteristics of population in India; Population growth rates, trends and regional variations in sex ratio; Age structure of population , foetal, infant and child mortality rates; Maternal mortality rates; Life expectancy; Pattern of Migration and Urbanization in India.

Books for reference

1. Agarwala S.N. (1972), India's Population Problem, Tata McGraw-Hill Co, Bombay .
2. Bogue, D.J. (1971), Principals of Demography, John Wiley, New Delhi.
3. Bose, A. (1996), India's Basic Demographic Statistics, B.R. Publishing Corporation, New Delhi.
4. Chenery H. and T.N. Srinivasan (Eds.), (1989), Hand Book of Development of Economics Vol. 1& 2 Elsevier, Amsterdam.
5. Choubey, P.K. (2000), Population Policy in India, Kanishka Publications, New Delhi.
6. Coale A. J. and E. M. Hoover (1958), Population Growth and Economic Development in Low Income Countries : A Case Study of India's Prospects, Princeton University Press, Princeton
7. Gulati, S.C. (1988), Fertility in India: An Econometric Study of a Metropolis, Sage, New Delhi.
8. Simon, J.L. (1992), Population and Development in Poor Countries; Princeton University Press.
9. Srinivasan, K. (1998), Basic Demographic Techniques and Applications, Sage, New Delhi.
10. Srinivasan, k. and A. Shariff (1998), India: Towards Population and Demographic goals, Oxford University Press, New Delhi.
11. Sryock, H. et al (1973), The Methods and Materials of Demography, US Department of Commerce, Washington, D.C.
12. United Nations (1973), The Determinants and Consequences of Population Trends, Vol. 1, UN Publications, New York.

PROJECT WORK

a) Individual work.

b)A short video or documentary can be added to the dissertation if the student desires.

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.Sc Information Technology
(Choice Based Credit System)

(with effect from the academic year 2016- 2017 onwards)
(44th SCAA meeting held on 30.05.2016)

Sem	Sub 'Pr. No.	Subject status	Subject Title	Hrs / week	Cre - dits	Marks				
						Maximum			Passing minimum	
						Int.	Ext	Tot.	Ext.	Tot
III	13	Core – 7	Software Engineering	6	5	25	75	100	38	50
	14	Core – 8	Advanced Operating System	6	5	25	75	100	38	50
	15	Core – 9	Advanced Database Management System	6	5	25	75	100	38	50
	16	Core – 10	Research Methodology	6	5	25	75	100	38	50
	17	Elective – III (Choose any one)	A.Net Programming B.Digital Image Programming C. Cloud Computer	3	4	25	75	100	38	50
	18	Mini Project	Mini Project Lab	3	9	50	50	100	25	50
IV	19	Project	Main Project and Vivo Voce	3	15	50	50	100	25	50

Software Engineering

Unit-I

Introductions: Evolving role of software – Software characteristics, components and its applications – Generic view of software engineering – Software process models.

Unit-II

Systems Analysis: Requirements analysis – Analysis principles – Prototyping Software requirement specification – Data modeling, functional modeling and behavioral modeling.

Unit-III

Design concepts: Design and software quality, Design concepts : Abstraction, refinement, modularity, and software architecture control hierarchy structural partitioning and information hiding, Effective modular design: functional independence, cohesion and coupling – design documentation.

Unit-IV

Design Methods: Data design – Architectural design process: transform mapping and transaction mapping – interface design – procedural design. Design for Real – Time Systems : System considerations – real time systems – analysis and simulation of real time systems.

Unit-V

Software Testing Methods : Software testing fundamentals. White box testing: basis path testing and control structure testing – black box testing – testing for specialized environments. Software Testing Strategies: A strategic approach to software testing – unit testing – integration testing – validation testing – system testing.

REFERENCE BOOKS

1. R.S.Pressman "Software Engineering", (5th edition) Tata McGraw Hill, 1997.
2. Software Engineering Principles And Practices, Second Edition, Rohit Khurana ITL ESL
3. Software Engineering Principles And Practice, Waman S Jawadekar, Tata McGraw-Hill

Advanced Operating System

Unit-I

Introduction : What is an Operating System? – Main frame Systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real-Time Systems – Handheld Systems – Feature Migration – Computing Environments. Computer System Structures : Computer-System Operation - I/O Structure - Storage Structure - Storage Hierarchy - Hardware Protection - Network Structure. Operating System Structures: System Components – Operating System Services - System Calls - System Programs - System Structure - Virtual Machines - System Design and Implementation - System Generation.

Unit-II

Process Management : Process Concept - Process Scheduling - Operations on Processes – Cooperating Processes – Inter Process Communication – Communication in Client-Server Systems. CPU Scheduling : Scheduling Concepts Scheduling Criteria - Scheduling Algorithms - Algorithm Evaluation – Multiple-Processor Scheduling – Real-Time Scheduling. Process Synchronization: The Critical-Section Problem – Synchronization Hardware – Semaphores – Classic Problems of Synchronization – Critical Region – Monitors. Deadlocks: Deadlock Problem – Deadlock Characterization – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection - Recovery from Deadlock.

Unit-III

Memory Management: Background – Swapping - Contiguous Memory Allocation - Paging – Segmentation - Segmentation with Paging. Virtual Memory: Demand Paging - Page Replacement – Allocation of Frames - Thrashing. File System Interface: File Concept - Access Methods - Directory Structure - File System Mounting - File Sharing - Protection. File System Implementation: File-System Structure - File-System Implementation - Directory Implementation - Allocation Methods - Free-Space Management - Recovery.

Unit-IV

I/O systems: I/O Hardware - Kernel I/O Subsystem. Mass-Storage Structure : Disk Structure - Disk Scheduling - disk management - swap-space Management, RAID structure, disk attachment, stable-storage implementation, tertiary-storage structure.

Unit-V

Comparative study - DOS, UNIX/LINUX, Windows 9x, Windows NT.

REFERENCE BOOKS

1. Silberschatz, Galvin, Gagne, “Operating Systems Concepts”, John Wiley & Sons, Inc., Sixth Edition.
2. Andrew S. Tanenbaum, “Modern Operating Systems”, Prentice Hall of India, Second Edition.
3. H. M. Deitel, “Operating Systems”, Pearson Education, Second Edition.

Advanced Database Management Systems

Unit-I

Introduction to Database Management Systems : Introduction, Characteristics of Data – Database Management System – Types of Database Management Systems –Introduction to Relational Database Management Systems: The relational Data Structure – Relational Data Integrity – Relational Data Manipulation- Codd’s Rules.

Unit-II

E-R modeling : Introduction-Components of E-R Model – E-R Modeling Symbols - Data Normalization : Introduction - first to fifth normal form –DKNF - Denormalization – Relational Algebra and Relational Calculus : Relational Algebra – Relational Calculus .

Unit- III

Introduction to SQL : Introduction- History of SQL – Characteristics of SQL – Advantages of SQL – SQL Data types and Literals – Types of SQL Commands – SQL Operators – Operator Precedence – Tables ,Views and Indexes : Creation , Modification and deletion of table , View and Indexes.

Unit- IV

Queries and Sub queries : Queries : Qualified Retrieval – Eliminating Duplicates – Select using In, Between and Like - Escape Clause – Selecting Computed Values – Grouping – Ordering - Sub-queries : Execution of Subquery – Nested Subquery – Parallel Subquery – Correlated Subquery – Aggregate Functions: General Rules – COUNT ,SUM,AVG,MAX and MIN – Insert, Update and Delete Operations – Single row and Bulk Insert -Update –Delete .

Unit- V

Cursors : Cursor Operations – Cursor Positions : Cursor Definition ,Opening the cursor– Fetch, Update, Delete and Closing the Cursor – Joins and Unions : Aliases – Qualities of a Good Join – Equijoin , Non Equijoin and Theta Joins – Natural Join , Self Join – Joining more than 2 Tables – Joins Vs Subqueries –Outer Join- Unions –Triggers- Types of Triggers –Replace ,Dropping Triggers – Advantages and Limitations of Triggers.

REFERENCE BOOKS

1. Database System Concepts- Avi Silberschatz, Henry F. Korth , S. Sudarshan, McGraw-Hill Sixth Edition.
2. Database Systems Using Oracle – Nilesh Shah
3. Database Management Systems – Alexis Leon , Mathews Leon
4. ORACLE 9i – The Complete Reference – Kevin Loney, George Koch & The Experts at Tusc, Tata McGraw Hill Publishing company Ltd., 2002.

Research Methodology

Unit-I

Research Methodology: An Introduction - Meaning of Research - Objectives of Research - Types of Research, Motivation in Research - Research Approaches, Significance of Research - Research Methods Verses Methodology - Research and Scientific Method - Research Process - Criteria of Good Research - Problems Encountered by Researchers in India. Defining the Research Problem: What is a Research Problem? - Selecting the Problem - Technique Involved in Defining a Problem - Research Design: Meaning - Need for research Design - Features of a Good Design - Important Concept relating to Research Design - Different Research Designs - Basic Principles of Experimental Designs.

Unit-II

Sampling Design: Census and sample survey - Implications of a sample design - Steps in sample design - Criteria of selecting a sampling procedure - Characteristics of a good sample design - Different types of sample designs - How to select a random sample? - Random sample from an infinite Universe - Complex random sampling designs - Measurement and scaling Techniques: measurement in research - Measurement scales - Sources of error in measurement - Tests of sound measurements - Technique of developing measurement tools - Scaling, meaning of scaling - Scale classification bases - Important scaling techniques - Scale construction techniques.

Unit-III

Methods of Data Collection - Collection of Primary Data - Observation Method - Interview method - Collection of Data through Questionnaires - Collection of Data through Schedules - Some Other Methods of Data Collection - Collection of Secondary Data - Selection of Appropriate Method for Data Collection - Interpretation and Report writing - Meaning of Interpretation, Why Interpretation? - Technique of Interpretation, Precaution in Interpretation - Significance of Report Writing - Different Steps in Writing Report - Layout of the Research Report - Types of Reports - Mechanics of Writing a Research Report - Precautions for Writing Research Reports.

Unit-IV

Chi-Square Test for large samples – Definition of Chi-Square – Limitations of Chi-Square test - Chi-Square test as a test of goodness of fit and as a test of independence – Yate’s correction and its applications – Analysis of variance(ANOVA) : Concept – One way ANOVA – ANOVA in test in Latin Square Design

Unit-V

Algorithmic Research – Introduction - Algorithmic Research Problems - Types of Solution procedure/Algorithm - Steps of Development of Algorithm - Steps of algorithmic Research - Design of Experiments and Comparison of Algorithms - Meta Heuristics for Combinatorial Problems - The Computer: Its Role in research - The computer and Computer Technology - The Computer System - Important Characteristics - Computer Applications- Computers and Researchers.

REFERENCE BOOKS

1. C.R.Kothari, “Research Methodology Methods and Techniques”, (Second Revised Edition), New Age International Publishers, New Delhi, 2010.
2. R.Panneerselvam, “Research Methodology”, PHI Learning Private Limited, New Delhi, 2009.

Net Programming

Unit-I

HTML - Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Colour controls, Different HTML tags, Table layout and presentation, Use of font size & Attributes. List types and its tags, Use of Frames and Forms in web pages, ASP & HTML Forms.

Unit-II

Overview of Dynamic Web page, introduction & features of ASP.NET, Understanding ASP.NET Controls, Applications, Web servers, installation of IIS. Web forms, web form controls -server controls, client controls. Adding controls to a web form, Buttons, Text Box , Labels, Checkbox, Radio Buttons, List Box. Adding controls at runtime. Running a web Application, creating a multiform web project. Form Validation: Client side validation, server Side validation, Validation Controls : Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control.

Unit-III

Overview of ADO.NET, from ADO to ADO.NET, ADO.NET architecture, Accessing Data using Data Adapters and Datasets, using Command & Data Reader, binding data to data bind Controls, displaying data in data grid. XML in .NET, XML basics, attributes, fundamental XML classes: Document, textwriter, textreader. XML validations, XML in ADO.NET, The XMLDataDocument.

Unit-IV

Web services: Introduction, State management- View state, Session state, Application state. SOAP, web service description language, building & consuming a web service. Web application deployment. Caching. Threading Concepts, Creating Threads in .NET, managing threads, Thread Synchronization Security features of .NET, Role based security & Code access security, permissions

Unit-V

Overview of C#, C# and .NET, similarities & differences from JAVA, Structure of C# program. Language features: Type system, boxing and unboxing, flow controls, classes, interfaces, Serialization and Persistence, Serializing an Object, Deserializing an Object Delegates, Reflection.

REFERENCE BOOKS

1. The Complete Reference ASP.NET by Mathew Macdonald – TMH Professional ASP.NET- Wrox publication
2. VB.NET Programming Black Book by steven holzner –dreamtech publications
3. Introduction to .NET framework-Worx publication . ASP.NET Unleashed C# programming – wrox publication
4. C# programming Black Book by Matt telles – Dreamtech Publication

Digital Image Processing

Unit-1

Introduction: What is Digital Image Processing? – Fundamentals Steps in DIP – Components of an Image Processing System.

Digital Image Fundamentals: Light and Electromagnetic Spectrum – Image Sensing and Acquisition – Image Sampling and Quantization – Some Basic Relationships between Pixels.

Unit-2

Image Enhancement in the Spatial Domain: Some Basic Gray Level Transformations – Histogram Processing – Enhancement Using Arithmetic/Logic Operations – Basics of Spatial Filtering – Smoothing Spatial Filters – Sharpening Spatial Filters.

Image Enhancement in the Frequency Domain: Introduction to the Fourier Transform and the Frequency Domain – Smoothing Frequency-Domain Filters – Sharpening Frequency Domain Filters.

Unit-3

Image Restoration: A Model of the Image Degradation/Restoration Process – Noise Models – Restoration in the presence of Noise Only-Spatial Filtering.

Image Compression: Fundamentals – Image Compression Models – Error-free Compression – Lossy Compression – Image Compression Standards.

Unit-4

Morphological Image Processing: Preliminaries – Dilation and Erosion – Opening and Closing – The Hit-or-Miss Transformation – Some Basic Morphological Algorithms.

Segmentation: Detection and Discontinuities – Edge Linking and Boundary Detection – Thresholding – Region-Based Segmentation.

Unit-5

Representation and Description: Representation – Boundary Descriptors – Regional Descriptors.

Object Recognition: Patterns and Pattern Classes – Structural Methods.

REFERENCE BOOKS

1. Digital Image Processing – Rafael C.Gonzalez and Richard E.Woods, Pearson Education, 2009.
2. Digital Image Processing and Analysis – B.Chanda and D.Dutta Majumder, Prentice Hall India – 2009.
3. Digital Image Processing – S.Jayaram, S.Esakkirajan, T.Veerakumar, Tata McGraw Hill Education Private Limited, New Delhi, 2011.

Cloud Computing

Unit-I

Distributed System Models and Enabling Technologies: Scalable Computing over the Internet, Technologies for Network-Based Systems, System Models for Distributed and Cloud Computing, Software Environments for Distributed Systems and Clouds, Performance, Security and Energy Efficiency

Computer Clusters for Scalable Parallel Computing: Clustering for Massive Parallelism, Computer Clusters and MPP Architectures, Design Principles of Computer Clusters, Cluster Job and Resource Management

Unit-II

Cloud Platform Architecture over Virtualized Data Centers: Cloud Computing and Service Models, Data-Center Design and Interconnection Networks, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms GAE, AWS, and Azure, Inter-cloud Resource Management, Cloud Security and Trust Management

Unit-III

Service-Oriented Architectures for Distributed Computing: Services and Service-Oriented Architecture, Message-Oriented Middle-ware, Portals and Science Gateways, Discovery, Registries, Metadata and Databases, Work-flow in Service-Oriented Architectures.

Unit-IV

Cloud Programming and Software Environments: Features of Cloud and Grid Platforms, Parallel and Distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments.

Unit-V

Ubiquitous Clouds and the Internet of Things: Cloud Trends in Supporting Ubiquitous Computing, Performance of Distributed Systems and the Cloud, Enabling Technologies for the Internet of Things, Innovative Applications of the Internet of Things, On-line Social and Professional Networking.

REFERENCE BOOKS

1. Distributed and Cloud Computing- Kai Hwang, Geoffrey C. Fox, Jack J. Dongarra –Elsevier-2012
2. Cloud Computing – A Hands-on Approach – Arshdeep Bahga, Vijay Madisetti – University Press, 2014
3. Enterprise Cloud Computing – Gautam Shroff – Cambridge University Press – 2010

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Mini Project Lab

MSU / 2016-17 / PG-Colleges / MSc. (Information Technology) / Semester-IV / Ppr.no.19 / Project.

**NO IV SEMESTER THEORY AND PRACTICAL COURSES - ONLY 6 MONTHS
EXTERNAL MAIN PROJECT.**

**MANONMANIAM SUNDARANAR UNIVERSITY,
TIRUNELVELI**

PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.Sc. Botany

(Choice Based Credit System)

(with effect from the academic year 2016- 2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem	Sub 'Pr. No.	Subject status	Subject Title	Hrs/ week	Cre - dits	Marks				
						Maximum			Passing minimum	
						Int.	Ext.	Tot.	Ext.	Tot.
III	11	Core – 7	Taxonomy of Angiosperms and Economic Botany	6	5	25	75	100	38	50
	12	Core – 8	Biochemistry and Biophysics.	6	5	25	75	100	38	50
	13	Core – 9	Research methodology, Bioinstrumentation and Biological Techniques	6	5	25	75	100	38	50
	14	Elective- III	Computer Application and Bioinformatics (Major/ Non-Major)	6	5	25	75	100	38	50
	15	Practical	Core Practical 7,8 and 9	6	-	--	-	-	-	
IV	16	Core – 10	Plant Physiology and Metabolism	6	4	25	75	100	38	50
	17	Core – 11	Plant Ecology and Conservation Biology	6	4	25	75	100	38	50
	18	Core – 12	Applied Biotechnology	6	4	25	75	100	38	50
	19	Practical	Core Practical 7,8 and 9	--	4	50	50	100	25	50
	20	Practical	Core Practical 10,11,12	3	4	50	50	100	25	50
	21	Project	Project	3	5	50	50	100	25	50

Taxonomy of Angiosperms and Economic Botany

UNIT- I

Principles - Classification - (a) Artificial - Linnaeus (b) Natural -Bentham and Hooker (c) Phylogenetic - Cronquist and APG System.

Taxonomic hierarchy - Species concept - Binomial nomenclature: Principles of ICBN - Typification - Principles of Priority - Effective and Valid publication - Citation - Retention and Rejection of names. Herbarium preparation, major Indian and World Herbaria. Identification and preparation of keys and its significance.

UNIT- II

A detailed study with special reference to the following families:

Study of **Polypetalae families:** Magnoliaceae, Portulacaceae, Zygophyllaceae, Sapindaceae, Aizoaceae, Combretaceae, Lythraceae, and Cucurbitaceae.

Study of **Gamopetalae families:** Asclepiadaceae, Convolvulaceae, Pedaliaceae, Acanthaceae, Boraginaceae, Bignoniaceae, Scrophulariaceae, and Verbenaceae.

UNIT - III

Study of **Monochlamydeae families:** Euphorbiaceae, Amaranthaceae, Nyctaginaceae, Polygonaceae, Aristolochiaceae and **Monocotyledons:** Commelinaceae, Liliaceae, and Poaceae.

UNIT – IV

Modern Plant Systematics: Taxonomic evidences - from Morphology, Anatomy, Embryology, Photosynthetic types- C₃,C₄ Plants, Phytochemistry, serotaxonomy and Numerical taxonomy.

Molecular Systematics: Use of molecular markers and applications of RFLP, ISSR, SSR, ITS, and QTL. DNA Bar-coding. Digital / virtual herbaria.

UNIT – V

General account on **Economic Botany** - utilization of selected crop plants - Cereals- (Rice, Millets); Spices and Condiments - (Cardamom, *Piper*); Commercial crops - Fibre (Jute); Timbers (Teak, Red Sandal Wood); Resins and Gums (*Asafoetida*, Rubber); Fixed oils (*Sesamum*, Sunflower); Volatile oils - (Rosemary); Beverages (Tea, Coffee); Natural dyes (*Indigofera*, *Lawsonia inermis*) and Drug yielding plants (*Andrographis paniculata* and *Withania somnifera*).

Reference books:

- 1) Anonymous, (1948 -1976). *The Wealth of India*. 11 vols. NISCAIR (CSIR), New Delhi.
- 2) Ahmedullah, M., and M.P. Nayar. 1987. *Endemic Plants of the Indian Region*. Vol. I. Botanical Survey of India. Howrah.
- 3) Bell, A. D. (1991). *Plant form*. Oxford University Press, Oxford.
- 4) Cronquist, A. (1981). *An Integrated System of Classification of Flowering Plants*. Columbia University Press, New York.
- 5) Davis, P.H. and Heywood, V.H. 1973. *Principles of Angiosperms Taxonomy*. Robert E. Kreiger Pub. Co., New York.
- 6) Gamble, J.S., and C.E.C. Fischer. 1967. *Flora of the Presidency of Madras*. Vols. I - III. Botanical Survey of India. Calcutta.
- 7) Graham, L.E. 1993. *Origin of Land Plants*. John Wiley & Sons. Inc. New York.
- 8) Grant, W.F. 1984. *Plant Biosystematics*. Academic Press, London.
- 9) Greuter, W, (Ed.). 2000. *International Code of Botanical Nomenclature*. (St. Louis Code). Koeltz Vesentific Books. Germany.
- 10) Harrison, H.J.1971. *New Concepts in Flowering Plant Taxonomy*. Hieman Educational Books Ltd., London.
- 11) Henry,A.N., M.Chandrabose. 1980. *An Aid to International Code of Botanical Nomenclature*. Today & Tomorrow's Printers and Publishers. New Delhi.
- 12) Heywood, V.H. and Moore, D.M. 1984. *Current Concepts in Plant Taxonomy*. Academic Press, London.
- 13) Hooker, J. D. 1872 – 1897. *The Flora of British India*. 7 vols. (Rep. 2004) Bishen Singh Mahendra Pal Sigh, Dehra Dun.
- 14) Jain, S.K. and R.R. Rao. 1977. *A Handbook of Field and Herbarium Methods*. Today and Tomorrow's Printers and Publishers, New Delhi.
- 15) Jeffrey, C. 1982. *Introduction of Plant Taxonomy*, Cambridge University Press, Cambridge.
- 16) Judd, W. S, C. S. Campbell, E. A, Kellog, P. F. Stevens and N. J. Donoghue. 2008. *Plant Systematics – A phylogenetic approach*. 3rd edition. Sinauer Associates, Inc, Massachusetts, USA.
- 17) Kirtikar, K.R. and B.D. Basu I.C.S. *Indian Medicinal Plants*. Vol 1 -4. Bishen Singh Mahendra Pal Sigh, Dehradun, India.
- 18) Lawrence, G.H.M. 1951. *Taxonomy of Vascular Plants*. The Macmillan Company. New York.
- 19) Mabberley, D.J. 2008. *Plant-Book, A portable dictionary of plants, their classification and uses*. 3rd edition. Cambridge University Press, UK.
- 20) Moore, R., W.D. Clark, K.R. Stern and D. Vodopich. 1995. *Botany: Plant Diversity*. Wm. C. Brown Publishers. London.
- 21) Nadkarni, K.M. & A.K.Nadkarni. *Indian Materia Medica*. 1st Edition 1908, 3rd Edition 1954. Popular Prakashan, Bombay.

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- 22) Naik, V. N. 2000. *Taxonomy of Angiosperms*. Tata McGraw–Hill Publ Co. Ltd., New Delhi.
- 23) Nayar, M.P., 1996. "*Hot Spots*" of Endemic plants of India, Nepal and Bhutan. Tropical Botanic Garden and Research Institute, Thiruvananthapuram, India.
- 24) Nayar, M.P., And R.K. Sastry. 1987-1990. *Red Data Book on Indian Plants*. Vols. I - III. Botanical Survey of India. Howrah.
- 25) Nordenstam, B., El Gazaly, G. and Kassas, M.2000. *Plant Systematics for 21st Century*. Portlant Press Ltd., London.
- 26) Raven, P.H., R.F. Evert, and S.E. Eichhon. 1992. *Biology of Plants*. 5th Edition. Worth Publishers. New York.
- 27) Santapau, H. and H.A. Henry. 1994. *A dictionary of the flowering plants in India*, CSRI, New Delhi.
- 28) Simpson, M. G. 2010. *Plant Systematics*. Elsevier Academic Press, California, USA.
- 29) Subramaniam, N.S.1995. *Modern Plant Taxonomy*. Vikas Publishing House. New Delhi.
- 30) Sivarajan, V.V. 1996. *Introduction to the Principles of Plant Taxonomy*. Oxford & IBH Publishing Company Ltd., New Delhi.
- 31) Stuessy, T. F. (1990). *Plant taxonomy - the systematic evaluation of comparative data*. Columbia Univ. Press, Columbia.
- 32) Takhtajan, A. 1997. *Diversity and Classification of Flowering Plants*. Bishen Singh and Mahendrapal Singh, Dehra Dun, India.
- 33) UNEP (1995). *Global Biodiversity Assessment*. Cambridge University Press, London.
- 34) Warriar, P.K., Nambiar, VPK & C. Ramankutty (Eds.).1993-1996..*Indian Medicinal Plants: A compendium of 500 species*. Vols.1-5. Orient BlackSwan / Universities Press. Hyderabad.

Biochemistry and Biophysics

UNIT -I

Biomolecules: Carbohydrates - properties of mono, oligo and polysaccharides. Structure and functions of trioses, tetroses, pentoses, hexoses, maltose, sucrose, starch and pectin-glycosidic linkage, isomerism and mutarotation. Deoxy sugars, glycoproteins, amino sugars.

UNIT- II

Amino acids and proteins, ionic forms of amino acids. General reactions of amino acid metabolism. Zwitterion, isoelectric pH, optical isomers of amino acids and physical properties of amino acids.

Formation of peptide bond - peptides - structure of polypeptides primary, secondary, tertiary and quaternary protein structure - super secondary structures. Ramachandran plot - denaturation of proteins.

UNIT – III

Lipids - Classification, structure and properties - Fatty acids - saturated and unsaturated fatty acids - Structure of fatty acids and glycerol -phospholipids, glycolipids, steroids. Biosynthesis and Oxidation of fatty acid - Glyoxalate pathway - Gluconeogenesis.

UNIT - IV

Enzymes - Properties - Cofactors, metallic activators, coenzymes. Nomenclature and Classification - Enzyme kinetics - Concept of active sites Michaelis-Menton constant - mechanism of enzyme action - enzyme inhibitors - competitive and non-competitive, allosteric control of enzymes. Enzyme regulation.

UNIT – V

Properties of light - Different components of electromagnetic radiation. Emission - Excitation - Fluorescence and Phosphorescence - Bioluminescence. Laws of Thermodynamics, Redox potential, dissociation and association constant, activation energy, binding energy. High energy compounds in biology and their significance.

Reference Books

1. Adams, R.L.P, Burdon, R.H., Campbell, A.M., Leader, D.P. and Smile, R.M.S. 1981. The biochemistry of Nucleic acids. Chapman and Hall Ltd. New York.
2. Agarwal, O.P. 1989. Chemistry of organic natural products. Goel Publishing House, New Delhi.
3. Bonner and Varner, 1976. Plant Biochemistry. Academic Press. NewYork.
4. Deb, A.C. 2011. Fundamentals of Biochemistry. New Central Book Agency (P) Ltd., Kolkatta.
5. Conn and Stumpt, 1987. Outlines of Biochemistry. John Wiley and Sons, NewYork.
6. Jain, J.L. 2005. Fundamantals of Biochemistry. S. Chand and Company, New Delhi.
7. Jayaraman, J. 1895. Laboratory Manual in Biochemistry, Wiley Eastern Limited, New Delhi.
8. Plummer, D.T. 1990. An introduction to Practical Biochemistry. Tata Mc Graw Hill publishing Company, New Delhi.
9. Stryer, 1986. Biochemistry. CBS Publishers and Distributors, New Delhi.
10. Satyanarayana, U. 2005. Biochemistry. Books and Allied (P) ltd, Kolkatta.
11. Palanichamy and Shanmugavelu, M. 1996. Principles of Biophysics. Palni Paramount Publications.
12. Narayanan, P. 2008. Essentials of Biophysics. New Age International Publishers, New Delhi.

Research Methodology, Bioinstrumentation and Biological Techniques

UNIT - I

Research Methodology: Choosing the problem for research - Review of Literature - Primary, Secondary and Tertiary sources - Bibliographs - Indexing and abstracting - Reporting the results of research in conference - Oral and Poster presentation. Planning and preparation of thesis. Research journals, Editing & Proof correction, Abstract writing and keywords selection, Full paper, Short Communication, Monographs, Review Articles. Reference collections, Citation, Thesis format, Journal formats. Impact Factor, Style Manuals.

UNIT- II

Biostatistics: Scope, Collection and classification of data, Tabulation, Graphical and diagrammatic representation, Histograms. Probability analysis, Mean, Median, Mode. Students - t - test, ANOVA - Application softwares - SPSS.

UNIT – III

Microscopy - Principles and application - Light - Dark field - Phase contrast - Fluorescence - Polarization - Scanning and Transmission Electron Microscopy, Photomicrography.

Cytochemical and histochemical methods- Microtomes: rotary, wood and cryo types. Microtome techniques: dehydration, clearing, fixation, embedding, staining, mounting, sectioning. Cytochemistry and detection of nucleic acids, carbohydrates, proteins and lipids.

UNIT - IV

Centrifugation: High speed, and Ultra centrifuges.

Spectroscopy: Flame photometer; UV-Vis Spectrophotometer, AAS, FTIR, NMR, Fluorescence, Mass, and Raman Spectroscopy.

Chromatography: Theory, principles and applications of Paper, TLC, gel filtration, ion exchange, affinity, GC, HPTLC and GCMS.

UNIT -V

Electrophoresis: Basic principles, theory and applications of starch gel, agarose, native and denaturing PAGE, isoelectric focusing.

Radiolabelling techniques: Handling of Radioisotopes in labs, Dosimetry, Ionization chamber, GM counter, Solid and liquid scintillation counters, Autoradiography. Radio ImmunoAssay.

Introduction to Nanoscience and Nanobiology methods.

Books for References:

- 1) Daniel WW, 1995. Biostatistics. 7th edition, John Wiley and Sons, New York, USA.
- 2) Bliss CI, 1970. Statistics in Biology. Vol I and II, Mc Graw-Hill Inc. USA.
- 3) Green, M. R. and Sambrook, J. 2012. *Molecular Cloning: A Laboratory Manual*. 4th Edition, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.
- 4) Khan, I.A. and Khanum, A. 1994. *Biostatistics*. Vikas Publishing House Pvt. Ltd. New Delhi.
- 5) Panse, V.G. and Sukhatme, P.V. 1967. *Statistical Methods for Agricultural Workers*. ICAR, New Delhi.
- 6) Plummer, D.T. 1988. *An Introduction to Practical Biochemistry*. Tata McGraw Hill Publishing Company. New Delhi.
- 7) Raghuvanshi. 1995. *Practical Exercises in Cytology, Genetics, Plant Breeding and Biostatistics*. CBS Publishers & Distributors, New Delhi.
- 8) Sandhu, G.S. 1990. *Research Techniques in Biological Sciences*. 1st Edition. Anmol Publications, New Delhi.
- 9) Steel, R.G.D. and Torrie, J.H. 1960. *Principles and Procedures of Statistics with special reference to Biological Sciences*. McGraw-Hill.
- 10) Wilson, K. and Walker, J. 2000. *Principles and Techniques of Practical Biochemistry*. Cambridge University Press, London.
- 11) Balagurusamy, E. 2009. *Fundamentals of Computers*. Tata McGraw-Hill Education Pvt. Ltd., New Delhi.
- 12) Rajaraman, V. *Introduction to Information Technology*. PHI. New Delhi.

Computer Application and Bioinformatics

UNIT - I

Computer - Definition, Need for computers, Characteristics of computer. Classification of computers - organisation to computer - detail of input units, output units, central processing unit. Peripheral and storage devices. Knowledge about windows and its scientific applications - MS Word, Power Point, Excel.

UNIT - II

Internet - world wide web - Internet protocols - Internet Browsers - Search Engines - HTML - e-mail - e-books and e-journals - Retrieval of information from Internet - Applications of Internet.

UNIT - III

Introduction to Bioinformatics - Definition, Need, Development and Potential of Bioinformatics - Genomics and Proteomics - Human Genome Project and medically relevant genes - Pharmacoinformatics - Cheminformatics.

UNIT - IV

Bioinformatics Databases: Nucleic acid sequence Databases - GenBank, EMBL, DDBJ. Protein Sequence Databases - SwissProt, TrEMBL. Structure Databases - PDB, CATH, CSD. Taxonomic Databases - GRIN, ILDIS, IPNI, Kew. Literature Databases - PubMed, MedLine, Scopus.

UNIT - V

Techniques in Bioinformatics: FASTA - BLAST - Types. Pairwise and Multiple Sequence Alignment methods. DNA sequence analysis - Open Reading Frame - Microarray Applications. Molecular Visualisation - JS Mol / RasMol. Prediction of Activity Spectra - PASS.

Books for Reference

1. Alexis Leon and Mathews Leon, 2013. *Computer Applications in Business*, Vijay Nicole Imprints, Chennai.
2. Bryan Bergeron, 2006. *Bioinformatics Computing*, Prentice Hall of India, New Delhi.
3. Gautham N., *Bioinformatics - Databases and Algorithms*, Narosa Publishing House, Chennai.
4. Ignacimuthu, S., 2012. *Basic Bioinformatics*, Narosa Publishing House. New Delhi.
5. Mohan P., 2009. *Fundamentals of Computers*, Himalaya Publishing House, New Delhi.
6. Narayanan, P., 2005. *Bioinformatics - A Primer*, New Age International Publishers, New Delhi.
7. Neeru Mundra Renu Vashisth, 2011. *Introduction to Information Technology*, Himalaya Publishing House, New Delhi.
8. Rastogi, S.C., Mandiratta Namita and Rastogi Parag, 2003. *Bioinformatics - Concepts, Skill Applications*, CBS Publications.
9. Ravishankar S. and Raphael P.V., 2004. *Computer Awareness and Applications*, Himalaya Publishing House, New Delhi.
10. Saxeena Sanjay, 2002. *MS office for everyone*, Vikas Publishing House, New Delhi.

11. Teresa K. Attwood and David J. Parry-Smith, 2006. *Introduction to Bioinformatics* Dorling Kindersley Pvt. Ltd. India.

Suggested Reading:

1. Alexis Leon and Mathews Leon, 2013. *Computer Applications in Business*, Vijay Nicole Imprints, Chennai.
2. Gautham N., *Bioinformatics - Databases and Algorithms*, Narosa Publishing House, Chennai.
3. Narayanan, P., 2005. *Bioinformatics - A Primer*, New Age International Publishers, New Delhi.
4. Teresa K. Attwood and David J. Parry-Smith, 2006. *Introduction to Bioinformatics* Dorling Kindersley Pvt. Ltd. India

Taxonomy of Angiosperms and Economic Botany

Practical

1. Identification of plants mentioned in the syllabus.
2. Preparation of dichotomous key.
3. Identification of Binomial using flora (J.S. Gamble).
4. Technical description of plants from locally available plants.
5. Dissection of floral parts.
6. A study tour of Taxonomic interest (any area) – Submission of an album with 20 photographs of plant specimens from the prescribed families and field note book. .
7. Spotters for Economic Botany - to know the family, binomials of economically important plants, their parts and economic importance.

Biochemistry and Biophysics

Practical

1. Determination of neutralization point of acid- base mixture by titration method using pH meter.
2. Estimation of sugars by anthrone method - Colorimetrically /Spectrophotometer.
3. Estimation of aminoacids by ninhydrin method colorimetrically / Spectrophotometer.
4. Estimation of proteins (Lowry's method / Bradford method).
5. Extraction and separation of known and unknown amino acids by using Paper Chromatography method.
6. Determination of saponification value of any two vegetable oils.
7. Determination of Km value of Nitrate Reductase enzyme.

Research Methodology, Bioinstrumentation and Biological Techniques

Practical

1. Demonstration of microscopes (Light and Dark field, phase-contrast, fluorescence, SEM, TEM).
2. Demonstration of centrifugation (Ultra, high speed and cryo).
3. Verification of Beer-Lambert Law using spectrophotometry.
4. Demonstration of TLC, UV-Vis Spectrophotometer, Flame photometer, and MASS spectrophotometer.
5. Separation of plant proteins using SDS-PAGE, and DNA by AGE.
6. Demonstration Microtomy: preparation of thin sections and permanent slides.
7. Micrometry: Principle and measurement of microscopic objects: Low power and high power.
8. Histochemical localisation of soluble components in plant cells - proteins, sugars, polysaccharides, lipids, nucleic acids, tannins, phenols, etc.
9. Demonstration of statistics software to analyse field data.
10. Knowledge of Bioinstruments and Biological techniques
11. Problems from Biostatistics – SD & SE , T – test and X^2

Plant Physiology and Metabolism

UNIT –I

Water and Plant relations: Cell water relations, mechanism of water uptake - Concept of Apoplast and Symplast. Absorption and transport of solutes (Passive and Active). Translocation of organic solutes. Phloem loading and unloading. Importance of macro and micronutrients. Transpiration - Mechanism of stomatal movement - starch-sugar interconversion theory and K⁺ ion transport and stomatal regulation.

UNIT - II

Photosynthesis - Photosynthetic pigments - Light harvesting complexes PS I and PS II. Photo oxidation of water. Mechanisms of electron and proton flow through photosynthetic transport chain - Z Scheme. Photo phosphorylation and mechanism of ATP synthesis. C₃, C₄ and CAM pathways. Photorespiration and its significance.

UNIT - III

Plant Respiration: Glycolysis, Citric acid cycle and Mitochondrial electron transport - Oxidative phosphorylation and terminal oxidation - cyanide resistant pathway - Beta oxidation - Glyoxylate Cycle.

Nitrogen metabolism - Biological nitrogen - Mechanisms of Nitrate uptake and reduction - ammonia assimilation.

UNIT - IV

Growth and development - Relative, Net and Sigmoid Growth Rate. Physiological role and mechanism of action of auxins, gibberellins, cytokinins, ethylene and abscissic acid. Growth retardants - Morphactins and Brassinosteroids.

Photoperiodism and Vernalizations - flower induction and development. Phytochrome - structure, properties and physiological role. Movements - Nastic and tropic movements. Senescence and Abscission - physiological and biochemical changes. Seed dormancy - Physiology of seed germination.

UNIT - V

Stress physiology - classification of stress - biotic and abiotic stress factors. Stress effects - morphological, biochemical, physiological changes associated with stress due to salinity, water, radiation, heavy metals, drought, freezing and heat. Heat shock proteins - Stress resistance mechanisms.

Reference Books.

1. Bidwell, R.G.S. 1980. Plant physiology Academic Press, New York.
2. Datt, S.C. 1989. Plant physiology central Book Depot. Allahabad - 48.
3. Devlin, R.M. 1990 Plant physiology Reinhold Publishers corp. Newyork.
4. Govindji, 1982. Photosynthesis. A.P. Newyork.
5. Salisbury, F.B and Ross, C. 2000. Plant Physiology. John Wiley & sons New Delhi.
6. Sinha, R.K. 2004. Modern Plant physiology. Narosa publishing House New Delhi.
7. Verma, V. 2007. A text Book of plant physiology. Ane Books, New Delhi
8. Noggle, G.R and Fritz, G.J. 2010. Introductory plant physiology. PHI learning Pvt. Ltd. New Delhi.
9. Jacob, W.P. 1979. Plant Hormones and plant Development.

Plant Ecology and Conservation Biology

UNIT- I Aim and scope of Ecology - Autecology and Synecology - Qualitative and Quantitative characters of community. Niche - definition and types. Methods of studying plant community.

Ecosystem: Types - Terrestrial Forest and Crop land ecosystem - Aquatic ecosystems - fresh water, marine, estuarine and mangroves with special reference to trophic structures - Major biomes of the world.

UNIT - II Ecological amplitude of a species and adaptation - Ecads, ecotypes, ecospecies, Raunkaier's Life Forms. Succession - causes, patterns of succession - xeroseres and hydroseres. Types of forests.

Energy resources: utilization - Renewable and Non-renewable energy resources. Earth summits- Kyoto protocol - Environmental Laws and Education.

UNIT - III Environmental pollution - Air, water, soil, thermal and radiation. Causes, consequences and control of pollution on Global environment, Ozone depletion, Greenhouse effect. Climate change and Global Warming. Ecological impact of pollution - soil erosion, deforestation. Disaster management - Floods, Earth quake, Cyclones, Tsunami and Landslides.

UNIT - IV Biodiversity - definition, scope and constraints, Levels of biodiversity (genetic, species and ecosystem), measures of biodiversity, values and use of biodiversity, loss of biodiversity, threats to biodiversity.

Phytogeography: Range - Dispersal and migration barriers hypothesis, Continental drift hypothesis, Land - Bridges hypothesis, Age and Area hypothesis, Endemism - Red Data Book. Continuous and discontinuous distribution of vegetation. Introduction to Remote Sensing and GIS.

UNIT - V Conservation Biology: current practices in conservation - Ecosystem approaches - Species based approaches–Social approaches - Chipko Movement, Narmada Bacho Andolan. *In situ* conservation (Protected area, Afforestation, Social Forestry, Agro Forestry, Biosphere Reserves, National Parks, Sanctuaries, Sacred Groves and Sthalavrikshas) and *ex situ* conservation (Botanical Gardens, Cryopreservation, Gene Banks, Seed Banks, Pollen Banks, DNA Banks. Tissue Culture and Biotechnological strategies of conservation. Role of organizations in Biodiversity management - IUCN, BSI and FAO.

Reference Books

1. Ignacimuthu, S. 2013. Environmental studies. MJP Publishers, India.
2. Agrawal, K.C. 1987. Environmental Biology. Agro-botanical Publications, India.
3. Ambasht, R. S. 1974. A Textbook of Plant Ecology. 3rd ed. Students' Friends Co. Varanasi, India.
4. Billings, W. B. 1965. Plants and the Ecosystem. Wardsworth Publishing Co. Inc., Belmont.
5. Kershaw, K. A. 1973. Quantitative and Dynamic Plant Ecology. Edward Arnold Publishers Ltd., London.
6. Kormandy, E. J. 1978. Concepts of Ecology. 2nd ed. Prentice Hall of India Pvt. Ltd., New Delhi.

7. Krishnan Kannan, 1997. Fundamentals of Environmental Pollution. S. Chand and Co. Ltd., New Delhi.
8. Levitt, J. 1980. Responses of Plants to Environmental Stresses. Acad. Press, New York.
9. Odum, E. P. 1971. Fundamentals of Ecology. W. B. Saunders & Co., Philadelphia, USA.
10. Odum, E. P. 1975. Ecology. 2nd ed. Oxford & IBH Publications, New Delhi.
11. Puri, G. S. 1960. Indian Forest Ecology. Vol. I & II. Oxford & IBH Publications, Delhi.
12. Vashista, P. C. 1974. A Textbook of Plant Ecology. Vishal Publications, Jullunder.
13. Cain, S. A. 1944. Foundation of Plant Geography. Harper & Brothers, New York.
14. Good, R. 1953. The Geography of Flowering Plants. 2nd ed. Longmans Green & Co. Inc., London.
15. Mani, M. S. 1974. Ecology and Biogeography of India. Dr. W. Junk Publishers, the Haque.
16. Frankel, O. H., Brown, A. H. D. and Burdon, J. J. 1995. The Conservation of Plant Diversity. Cambridge University Press, London.
17. Heywood, V. H. 1995. Global Biodiversity Assessment. UNEP, Cambridge University Press, London.

Applied Biotechnology

UNIT - I

Biotechnology - scope and potentialities. Tissue Culture: Single cell and suspension culture, Organ culture - Meristem, Embryo and anther culture. Production of haploids, detection and identification, and uses of haploids. Micropropagation - virus elimination, secondary metabolite production, haploids, triploids, encapsulated seeds - Application of plant tissue culture in agriculture and crop improvement.

UNIT - II

Outline of Genetic engineering - transposons as vectors - gene cloning - cloning in eukaryotes. Promoters and terminators - *Agrobacterium* derived promoters - 35S promoters of CaMV, inducible and tissue specific promoters. Importance of promoters. Amplification of genes by PCR. Gene transfer methods in plants - vectors - Ti and Ri plasmids of *Agrobacterium*, Physical delivery methods.

UNIT - III

Transgenic plants resistant to Pest, Insects and Herbicides - Transgenic plants with improved quality traits - Flavr Savr tomato, Golden rice. Improved varieties in Floriculture. Transgenic plants for molecular pharming. Edible vaccines. Genetically engineered Humulin.

UNIT - IV

Biotechnology for pollution abatement - Anaerobic biological treatment - Treatment of organic and inorganic wastes - Biorecovery of metals. Biosensors - Bioremediation methods - *In situ* and *ex situ* bioremediation - Biomining - Bioleaching.

Enzyme technology - large scale production of fungal enzymes -extraction and purification methods involved - application of fungal enzymes in different industries.

UNIT - V

Bio-fuels from all kinds of plants. Biodegradable plastics. Biotechnology and healthcare - Gene therapy - types, methods and applications. Production of antibodies, vaccines and monoclonal antibodies - applications.

Reference Books

1. Chawla, H.S. 2002. Introduction to Biotechnology. Oxford and IBH Publishing Company Pvt. Ltd., New Delhi.
2. Razdan, M.K. 2003. An Introduction to Plant Tissue Culture. Oxford and IBH Publishing Company Pvt. Ltd., New Delhi.
3. Dubey, R.C. 2006. Text Book of Biotechnology. S. Chand and Company Ltd.
4. Satyanarayana, U. 2008. Biotechnology. Books and Allied (P) Ltd, Kolkata.
5. Das, H.K. 2005. Text book of Biotechnology. Wiley Dream tech India Pvt. Ltd., Delhi.
6. Slater, A., N.W. Scott, and Flower, M.R. 2010. Plant Biotechnology: The genetic manipulation of plants. Second edition, Oxford University Press.

Taxonomy of Angiosperms and Economic Botany

Practicals

1. Identification of plants mentioned in the syllabus.
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2. Estimation of sugars by anthrone method - Colorimetrically /Spectrophotometer.
3. Estimation of aminoacids by ninhydrin method colorimetrically / Spectrophotometer.
4. Estimation of proteins (Lowry's method / Bradford method).
5. Extraction and separation of known and unknown amino acids by using Paper Chromatography method.
6. Determination of saponification value of any two vegetable oils.
7. Determination of Km value of Nitrate Reductase enzyme.

Research Methodology, Bioinstrumentation and Biological Techniques

Practicals

1. Demonstration of microscopes (Light and Dark field, phase-contrast, fluorescence, SEM, TEM).
2. Demonstration of centrifugation (Ultra, high speed and cryo).
3. Verification of Beer-Lambert Law using spectrophotometry.
4. Demonstration of TLC, UV-Vis Spectrophotometer, Flame photometer, and MASS spectrophotometer.
5. Separation of plant proteins using SDS-PAGE, and DNA by AGE.
6. Demonstration Microtomy: preparation of thin sections and permanent slides.
7. Micrometry: Principle and measurement of microscopic objects: Low power and high power.
8. Histochemical localisation of soluble components in plant cells - proteins, sugars, polysaccharides, lipids, nucleic acids, tannins, phenols, etc.
9. Demonstration of statistics software to analyse field data.
10. Knowledge of Bioinstruments and Biological techniques
11. Problems from Biostatistics – SD & SE , T – test and X^2

Plant Physiology and Metabolism

Practicals.

1. Determination of water potential by gravimetric method.
2. Measurement of photosynthesis - Hill activity (Time course).
3. Estimation of photosynthetic pigments with reference to age (Two stages).
4. To determine the Chl a / Chl b ratio in C₃ and C₄ plants.
5. Estimation of Proline in normal and stressed leaves.
6. Effect of pH, temperature and detergents on membrane permeability.
7. Extraction and separation of seed proteins.
8. Estimation of anthocyanins using colorimeter/Spectrophotometer.

Plant Ecology and Conservation Biology

Practicals.

1. Vegetation Analysis (Quadrats and line transects) - Raunkaier's frequency diagram dominance and density in a given area and Shannon - Weaver's measures of species diversity index.
2. Water analysis - Dissolved oxygen - Alkalinity - Carbonate and bicarbonate. Water hardness - Calcium and Magnesium, Chemical Oxygen Demand and Primary productivity (Winkler's method).
3. Estimation of organic matter in the soil by Walkley Black method.

Study of the following:

Field visit: Student may visit ecologically important Locations.

- I. Interpretations
 1. Climatic zones of our country.
 2. Vegetation types of India.
 3. Floral Kingdoms.
 4. Discontinuous distribution.
 5. Endemism.

Applied Biotechnology

Practicals:

1. Preparation of MS medium.
2. Demonstration of *in vitro* sterilization and inoculation methods using leaf and nodal explants of Tobacco, *Datura*, *Brassica*.
4. Study of Anther, Embryo and Endosperm culture, Micropropagation, Somatic embryogenesis and artificial seeds
5. Study of methods of gene transfer. Isolation of Plasmid DNA, Restriction digestion and gel electrophoresis of plasmid DNA, *Agrobacterium* - mediated, direct gene transfer by electroporation, microinjection, microprojectile bombardment.
7. Study of steps of genetic engineering for production of Bt cotton, Golden rice.
8. Production of biofuels from algae, Mass cultivation of algae, *Spirulina*- SCP production.
9. Compulsory visit to institution(s) related in the field of Biotechnology

MSU / 2016-17 / PG – Colleges / M.Sc.(Botany) / Semester-IV / Ppr.no.21 / Project

Project

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.Sc. Chemistry

(Choice Based Credit System)

(with effect from the academic year 2016- 2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem	Sub No.	Subject status	Subject Title	Hrs/ week	Cre- dits	Marks				
						Maximum			Passing Minimum	
						Int.	Ext	Tot.	Ext.	Tot
III	13	Core - 7	Organic Chemistry -III	5	5	25	75	100	38	50
	14	Core - 8	Inorganic Chemistry- III	5	5	25	75	100	38	50
	15	Core - 9	Physical Chemistry -III	5	5	25	75	100	38	50
	16	Core – 10	Scientific Research Methodology	3	3	25	75	100	38	50
IV	17	Core - 11	Organic Chemistry- IV	5	5	25	75	100	38	50
	18	Core - 12	Inorganic Chemistry -IV	5	5	25	75	100	38	50
	19	Core - 13	Physical Chemistry -IV	5	5	25	75	100	38	50
	20	Practical – IV	Organic Chemistry – II	4	4	50	50	100	25	50
	21	Practical – V	Inorganic Chemistry – II	4	4	50	50	100	25	50
	22	Practical -- VI	Physical Chemistry – II	4	4	50	50	100	25	50
	23	Project	Project work and viva-voce	3	3	50	50	100	25	50

Organic Chemistry – III

UNIT-I : ALIPHATIC NUCLEOPHILIC SUBSTITUTION AND ELIMINATION

REACTIONS:

Aliphatic Nucleophilic Substitution : Mechanism of S_N1 , S_N2 , S_{Ni} , $S_{N1'}$, $S_{N2'}$ and $S_{Ni'}$ reactions- Effect of substrate, nucleophile, leaving group and solvent on the rate of substitution- Ambident nucleophile- NGP- Mechanism of esterifications and ester hydrolysis (B_{AC2} and A_{AC2} mechanisms only).

Elimination Reaction: E_1 , E_2 and E_{1CB} mechanisms- Factors influencing elimination reactions- Hofmann and Saytzeff rules- Pyrolytic elimination- Chugaev and cope reactions- competition between substitution and elimination reactions.

UNIT – II: NMR SPECTROSCOPY

1H NMR spectroscopy: Basic Principle – number of signals – chemical shift – Factors influencing chemical shift - spin–spin splitting– classification of spin systems – analysis of AX, AMX and ABX systems – Geminal, Vicinal and long range couplings–NOE in stereochemistry – FTNMR.

C-13 spectroscopy: Principle of proton decoupled C-13 spectroscopy - comparison with 1H NMR – chemical shifts (aliphatic, olefinic, alkylic, aromatic and carbonyl compounds).

2D NMR spectroscopy: H^1-H^1 COSY, H^1-C^{13} COSY, NOESY, DEPT and INADEQUATE spectra.

UNIT – III: MASS SPECTROSCOPY

Basic Principles– Base peak – molecular ion – nitrogen rule – metastable ions – isotopic peak - daughter ions – Mc–Lafferty rearrangement – RDA – General rules for fragmentation pattern – Fragmentation pattern of simple compounds of hydrocarbons, alcohols, amines, aldehyde, ketone, ether, acids, phenols, nitro compounds, alicyclic compounds .

Alternative electron impact ionization technique– CI, FAB, ESI – MS, MALDI –MS, MALDI-TOF, ICP- MS.

One conjunction problem based on UV, IR, H^1 NMR, ^{13}C NMR and Mass spectroscopic techniques is compulsory under section – c. Problems shall be based on the reference books.

UNIT-IV : ORGANIC PHOTOCHEMISTRY AND PERICYCLIC REACTIONS

Organic photochemistry: Jablonskii diagrams-intersystem crossing-energy transfer process- Photosensitization- alpha cleavage or Norris type-I and gamma hydrogen transfer or Norrish Type II cleavage – Paterno-Buchi reactions- Barton reaction, photo oxidation and reduction reaction - cis-trans isomerisation. - Di- π methane rearrangement.

pericyclic reactions: Atomic and molecular orbital's -Woodward-Hoffmann rules, FMO method and correlation diagram approaches:

Electrocyclic reaction: con and dis rotatory motions for $4n$ and $4n+2$ system (butadiene and 1,3,5-hexatrienes)- Stereochemical course of electro cyclic reaction in terms of conservation of orbital symmetry.

Cyclo addition: suprafacial and antarafacial, $[2+2]$ and $[4+2]$ cyclo addition reactions (ethylene and butadiene)

Sigmatropic rearrangements - $[i, j]$ shift of C-H and C-C bonds (1,3) and (1,5) carbon migration.

UNIT-V : HETEROCYCLIC AND BIOMOLECULES

Synthesis and reactions of indole, oxazole, imidazole, thiazole, Carbazole, chromans, Chromons, pyrimidine, pyridazine, pyrazine, coumarins, benzopyrones and anthocyanins-synthesis of flavones, isoflavones, flavonol, and quercetin -Biosynthesis of flavonoids. Synthesis

Pyranose and furanose forms of aldohexose and ketohexose-methods used for the determination of ring size-A Detailed study on the structure of maltose, lactose and starch.

REFERENCES :

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3. I.L. Finar, 'Organic Chemistry', volume 2, sixth Edition, Pearson Education Inc., Singapore, 2006.
4. Raj K. Bansal, 'Organic Reaction mechanisms', Tata Mc Graw Hill, Third Editon, 2007.
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6. S. Kalsi, 'Spectroscopy of organic spectroscopy', second Edition , New Age International publishers Limited, 1995 .

7. Jag Mohan, 'Organic Analytical Chemistry Theory and Practice', Narosa Publishing House, 2003.
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10. D.H. Williams and Ian Fleming, 'Spectroscopic methods in organic chemistry', fifth Edition, Tata Mc Graw Hill, 1988.
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17. Singh, J., and Singh, J., "Photochemistry and Pericyclic reaction", New Age International, New Delhi, 2004.
18. H.O. House, 'Modern synthetic Reaction,' Second Edition, W.A. Benjamin, Inc., London, 1972
19. R.K. Mackie, M.M. Smith and R.A. Aitken, 'Guide Book to Organic Synthesis' Second Edition, Longman Scientific and Technical, Singapore, 1990.
20. Carrutherus, W., "Some Modern Methods in Organic Synthesis", Third edition, Cambridge University Press, New York, 1997.
21. F.A. Carey and J. Sundberg, 'Advanced Organic chemistry' part A and B, Plenum Press, 2005.
22. Michael B. Smith, 'Organic Synthesis,' Mc Graw Hill international Edition, 1994.
23. P. Sykes, 'A Guide book to mechanism in organic chemistry', Orient Longman, 1989.
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25. R.T. Morrison and R.N. Boyd, 'Organic Chemistry' sixth Edition, Prentice Hall, 1994.
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28. E.S. Gould, 'Mechanism and structure in organic chemistry' Holt, Rinehart and Winston Inc., 1959
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32. Bansal, K., "Heterocyclic Chemistry", Fourth edition, New Age International, New Delhi, 2005.
33. Organic chemistry by Clayden,Greeves, Warren & Wothers.
34. Pericyclic reactions by Ian Fleming.
- 35.Organic chemistry by John McMurry.
36. Organic chemistry by L.G. Wade. JR.
37. Named Organic reactions by Thomas laue & Andreas Plagens.

Inorganic Chemistry - III

UNIT – I : ORGANOMETALLIC CHEMISTRY - I

Definition - 18 e⁻ and 16 e⁻ rules and its correlation to stability - Synthesis and structures of metal carbonyls, metal nitrosyls and dinitrogen complexes- Substitution reactions of metal carbonyls - IR spectral applications– identifications of bridging and terminal CO groups —Stretching mode analysis of metal carbonyls—evidence for M-M bonds. Synthesis, properties and structural features of metal complexes with alkene, alkyne, allyl and arene systems. Metallocenes - synthesis, properties, structure and bonding with particular reference to ferrocene and zirconocene- covalent versus ionic bonding in zirconocene. Template synthesis of macro cyclic ligands.

UNIT - II : ORGANOMETALLIC CHEMISTRY- II

Organometallic compounds as catalysts and the requirements - Oxidative addition and reductive elimination- insertion and elimination reactions - nucleophilic and electrophilic attack of coordinating ligands - addition to bimetallic species and cyclo metallation reactions. Homogeneous catalysis –Wilkinson’s catalyst and hydrogenation reactions, Tollman’s catalytic loop; hydroformylation (oxo) reaction, Wacker and Monsanto acetic acid processes. Cluster compound, polymer-supported and phase-transfer catalysis. Heterogeneous catalysis – synthesis gas and water gas shift reactions; Fischer Tropsch process and synthetic gasoline, Ziegler-Natta polymerization and mechanism of stereo regular polymer synthesis. Cyclo oligomerisation of acetylenes (Reppé’s or Wilke’s catalyst)-Olefin isomerisation using Ni catalyst – olefin Metathesis catalysed by Schrock type carbene.

UNIT- III : SPECTRAL METHODS TO THE STUDY OF INORGANIC COMPOUNDS– I

NMR Spectroscopy: ³¹P, ¹⁹F and ¹⁵N - NMR - applications in structural problems based on number of signals, multiplicity, anisotropy (like [H Ni(PPh₃)₄]⁺, CFC₃, SF₄, TiF₄, PF₅, HPF₂, H₂PF₃, PF₃(NH₂)₂, P₄S₃, mer - and fac – Rh (PPh₃)₃Cl₃, P₃N₃(CH₃)₂Cl₄, P₄N₄Cl₆(NHC₆H₅)₂, NF₃, NH₃- fluxional molecules (including organometallic compounds) and study of fluxionality by NMR technique - NMR of paramagnetic molecules - contact shifts. Evaluation of rate constants - monitoring the course of reaction using NMR.

EPR spectroscopy: Zero field splitting and Kramer's degeneracy - Application of EPR in the study of transition metal complexes based on number of signals, multiplicity, anisotropy (like bis (salicylaldimine)copper(II), $[\text{Cu}(\text{bpy})_3]^{2+}$, $[\text{Cu}(\text{Phen})\text{Cl}_2]$, $[(\text{NH}_3)_5\text{Co}-\text{O}_2-\text{Co}(\text{NH}_3)_5]^{5+}$, $\text{Co}_3(\text{CO})_9\text{Rh}$, $[\text{CoF}_6]^{4-}$, $[\text{CrF}_6]^{3-}$, $\text{VO}(\text{acac})_2$, $\text{Fe}(\text{CO})_5^+$, $\text{Fe}(\text{CO})_5^-$, $[\text{Fe}(\text{CN})_5\text{NO}]^{2-}$, $[\text{Mn}(\text{dppe})_2]$, $[\text{MnF}_6]^{4-}$). Applications in predicting the covalent character of M-L bond and Jahn-Teller distortion in Cu(II) complexes. EPR spectroscopy of metallo biomolecules: copper and iron proteins.

UNIT – IV : THERMOANALYTICAL AND SPECTROANALYTICAL METHODS

Theory and principles of thermo gravimetric analysis, differential thermal analysis and differential scanning calorimetry – characteristic features of TGA and DTA curves-factors affecting TGA and DTA curves- complementary nature of TGA and DTA – applications of thermal methods in analytical chemistry - thermometric titrations - the study of minerals and metal compounds. Principle and applications of colorimetry, spectrophotometry, nephelometry, turbidimetry, fluorimetry, atomic absorption spectroscopy and atomic emission spectroscopy based on plasma sources.

UNIT -V : INORGANIC PHOTOCHEMISTRY

Frank Condon and thermally equilibrated excited (THEXI) states - properties of excited states of metal complexes (life time, redox potential etc.) – charge transfer excitation – bimolecular deactivation (quenching) and energy transfer – photochemical path ways : oxidation-reduction, isomerisation and substitutional processes – photochemistry of Cr(III), Co(III) complexes – Photochemical reactions of metal carbonyls. Photo physical and photochemical properties of $[\text{Ru}(\text{bpy})_3]^{2+}$ and comparison with $[\text{Fe}(\text{bpy})_3]^{2+}$ – Applications of inorganic photochemistry: photochemical conversion and storage of solar energy – inorganic photochemistry at semiconductor electrodes - Catalyzed photo reduction of CO_2 and CO – TiO_2 as a green photo catalyst in removing air and water pollutants.

REFERENCES:

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19. V. Balzani and A. Juris, *Coord. Chem. Rev.*, 211, 97–115, 2001.
20. Inorganic chemistry by Catherine E. Housecroft.
21. Inorganic chemistry by Miessler.
22. NMR, NQR, EPR & MOSSBAUER spectroscopy in inorganic chemistry by R.V.Parish.
23. Biological inorganic chemistry: An introduction by Robert R.Chrichton.
24. Bioinorganic chemistry: A short course by Rosette M. Roat – Malone.
25. The Organometallic chemistry of the transition metals by Robert H. Crabtree.

Physical Chemistry- III

UNIT-I : GROUP THEORY I Symmetry elements and operations. Groups-Types of groups abelian, non-abelian cyclic and sub-groups. Similarity transformations and classes of symmetry operations. Point groups and Schoenflies symbols. Representation of groups-Matrix representation of symmetry operations-reducible and irreducible representations. Direct product representation. Rearrangement theorem. Construction of multiplication tables for C_{2v} , C_{3v} and C_{2h} . The Great Orthogonality theorem and its consequences-Character table - construction of character tables for C_{2v} , C_{3v} , C_{4v} , C_{2h} , and D_2 point groups.

UNIT-II: GROUP THEORY II Standard Reduction Formula. Symmetry selection rules for infrared, Raman and electronic Spectra and Mutual exclusion principle. Determining Symmetries of normal vibrational modes for non linear molecules H_2O , NH_3 and trans- N_2F_2 . Projection operators and construction of Symmetry Adopted Linear Combinations. Determination of Hybrid orbitals in non-linear molecules (BF_3 , CH_4 , XeF_4 , BF_3 , PF_5 , and SF_6). Electronic Spectra of Ethylene and formaldehyde- Simplification of HMO calculations using group theory. Calculation of delocalization energy for ethylene, cyclo propenyl, 1,3-butadiene, and benzene systems.

UNIT- III : NQR AND MOSSBAUER SPECTROSCOPY

Principle of NQR spectroscopy - nuclear charge distribution and quadrupole moment. Quadrupole nucleus and its interaction with electric field gradient, nuclear orientations, the asymmetry parameter, quadrupole transitions in spherical and axially symmetric fields, quadrupole energy levels and field gradient. NQR spectra-effect of magnetic field on the spectra, relationship between electric field gradient and molecular structure.

Mössbauer spectra-Principles and experimental technique- sources, absorber, calibration. Doppler shift, recoil energy, isomer shift, quadrupole splitting, magnetic hyperfine interaction, Chemical applications- Quadrupole splitting in iron complexes.

UNIT – IV: MAGNETIC RESONANCE SPECTROSCOPY (NMR AND EPR)

Theory of NMR spectroscopy: nuclear spin and magnetic nuclei, nuclear magnetic moment, behavior of a bar magnet in a magnetic field, the NMR transitions, the Bloch equations, relaxation mechanisms. Parameters of NMR: measuring the chemical shift, shielding and deshielding of magnetic nucleus, chemical shifts in aliphatic and aromatic compounds, factors affecting chemical shift-inductive effect, anisotropy of chemical bonds, hydrogen-bond, temperature, solvent. Spin-spin splitting : effect of spin-spin splitting on the spectrum, mechanism of spin-spin splitting, chemical exchange, coupling constants; application of spin-spin splitting to structure determination- geminal- vicinal- long-range coupling; factors influencing geminal and vicinal coupling. ^{13}C , ^{19}F , ^{31}P NMR-range of chemical shift values, spectra of typical examples.

Electron paramagnetic resonance spectroscopy: theory of EPR spectroscopy, presentation of the spectrum, nuclear hyperfine splitting in isotropic systems. EPR spectra of anisotropic systems: anisotropy in g- values causes of anisotropy, anisotropy in hyperfine coupling, EPR spectra of triplet states and zero field splitting.

UNIT-V : ELECTRONIC SPECTROSCOPY

Electronic spectra of molecules: Born-Oppenheimer approximation, Franck-Condon Principle, selection rules, intensity of electronic transition, Vibronic coupling, types of electronic transitions. Chemical analysis by electronic spectroscopy: assignment of electronic transitions, application to the study of organic compounds. Emission spectroscopy: state of electronically excited molecules- dissociation, reemission, emission spectra of molecules.

Photo electron spectroscopy (PES): principle and technique of PES, ultra violet PES, X-ray PES. Lasers: nature of stimulated emission-coherence and mono chromaticity, population inversion, cavity and mode characteristics, Q-switching, mode locking; types of lasers-solid-state, gas, chemical, and dye lasers

REFERENCES:

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2. F. Albert Cotton, Chemical Applications of Group Theory, Third Edition, John Wiley & Sons, Singapore, 2003.
3. V. Ramakrishnan and M. S. Gopinathan, Group Theory in Chemistry, Vishal Publication, 1986.
4. Robert L. Carter, Molecular Symmetry and Group Theory, John Wiley and Sons, Inc., New York, 1998.
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20. I. N. Levine, Molecular Spectroscopy, John Wiley & Sons, New York, 1974
21. G. Aruldas, Molecular structure and spectroscopy

Scientific - Research Methodology

Unit – I: LITERATURE SURVEY

Source of chemical information – primary, secondary, tertiary sources-literature survey- Indexes and abstracts in science and technology – Applied science and technology index, chemical abstracts, chemical titles, current chemical reactions, current contents and science citation index.

Classical and comprehensive reference works in chemistry-synthetic methods and techniques, treatises, reviews, patents and monographs.

UNIT - II : CHEMICAL ABSTRACTS:

Current awareness searching: CA weekly issues, CA issue indexes.

Retrospective searching: CA volume indexes-general subject index, chemical substance index-formula index, index of ring systems, author index, patent index.

CA collective indexes: collective index (CI), decennial index (DI)

Access points for searching CA indexes- Index guide, general subject, terms, chemical substance names, molecular formulas, ring systems, author names, patent numbers.

Locating the reference: finding the abstract, finding the original document chemical abstract - service source index.

UNIT –III: CHOOSING A RESEARCH PROBLEM AND SCIENTIFIC WRITING

Identification of research problem – assessing the status of the problem - guidance from the supervisor – actual investigation and analysis of experimental results – conclusions.

Scientific writing-research reports, thesis, journal articles and books.

Steps to publishing a scientific article in a journal – types of publications-communications, articles, reviews, when to publish, where to publish, specific format required for submission.

Documenting- Abstracts-indicative (or) descriptive abstracts, informative abstract, footnotes, end notes, referencing styles-bibliography-journal abbreviations (CASSI), abbreviation used in scientific writing.

UNIT –IV: INSTRUMENTAL CHARACTERIZATION AND DATA ANALYSIS

Sample preparation of UV, FT-IR, TEM, SEM, EDAX, AFM and XRD techniques - Characterization of observed results – Data analysis - Report.

Errors in chemical analysis – classification of errors – determination of accuracy of methods – improving accuracy of analysis – significant figures – mean, standard deviation – comparison of results : “t” test, “f” test, Q test and “chi” square test – rejection of results – presentation of data.

UNIT –V: COMPUTER SEARCHES AND LITERATURE.

ASAP – Alerts, CA Alerts, scifinder, chemport, science direct, STN international, journal home pages. Online browsing of research articles – online submission of research papers in various Journals (ACS, RSC, Elsevier, Springer etc.) –Instructions to the authors – Impact factors. Writing project proposal to funding agencies (UGC, DST etc.).

REFERENCES

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3. R.O.Bullet, Preparing thesis and other manuscripts.
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16. H.Willard, L.MerritJr.andA.Dean, Instrumental methods of analysis.
17. D.A.Skoog and M.West, Principles of instrumental analysis.

18. B.K.Sharma, Instrumental methods of chemical analysis.
19. D.A. Skoog and M.West, Fundamentals of analytical chemistry.
20. J.D.Dick, Analytical chemistry.
21. S.M.Khopkar, Basic concepts of analytical chemistry.

Organic Chemistry – IV

UNIT-I: REACTION UNDER INTERMEDIATE CHEMISTRY

Reaction under Carbanion Intermediate: Claisen, Knoevenagel, Stobbe, Darzen, acyloin condensation Shapiro reaction and Julia olefination.

Reaction through carbene intermediate: Bamford – Stevens and Simmons-Smith reactions

Reaction under Carbocation intermediate: Oxymercuration, halolactonisation, Baeyer-Villiger oxidation

Reaction following Radical intermediate: McMurry coupling, Gomberg-Pechmann and Pschorr reactions.

Reaction involving Ylide intermediate: Wittig reaction and Peterson olefination.

UNIT-II: CONFORMATIONAL ANALYSIS

Conformation and configuration-conformational free energy-conformational analysis of mono substituted (alkyl, halogens) and 1,1-disubstituted (alkyl) and 1,2-1,3- and 1,4-dimethyl substituted cyclohexanes -compounds existing in boat form-conformation of cyclohexanone, decalin and perhydrophenanthrene-Curtin-Hammett principle- conformation and reactivity of acyclic and cyclic compounds (6-membered).

UNIT-III: RETEROSYNTHETIC ANALYSIS

Synthon-synthetic equivalent-Functional group interconversions -use of protecting groups for alcohols, amines, acids, carbonyl compounds- use of activating and blocking groups-Robinson annulations reaction-carbon skeletal complexity-Role of key intermediates in organic synthesis. Retrosynthetic analysis of the following compounds: Twistane, cis - Jasmone, Baclofen, phenanthrene, Trihexyl phenyl, S-propanediol, R and S – Epichlorohydrin, Abietic acid, Isonootkatone, cascarillic acid, camphor and 2,4-dimethyl-2-hydroxy pentanoic acid.

UNIT-IV: REAGENTS IN ORGANIC SYNTHESIS

2,3-Dichloro-5,6-dicyano-1,4-benzoquinone (DDQ), DMSO, Super hydrides- Dess-Martin-periodinane-Osmium tetra oxide.

Modern Reagents: Introductory treatment of the application of silicon (Tri alkyl silyl halides, organo silanes), Boron (9 – BBN, borane, and alkyl borane), phosphorus (phosphoranes), palladium (Still coupling, Suzuki Coupling, Heck and Negishi reactions) samarium(SmI₂), Ruthenium(RuO₂, Ru-Binap Complex), Rhodium(Wilkinson's Catalyst), and platinum (PtO₂, Adam's Catalyst) reagents in organic synthesis.

UNIT-V: STEROID

Classification- structural elucidation of cholesterol, irradiated products of ergosterol. Conversion of cholesterol to androsterone, progesterone, testosterone, 5 α - and 5 β -cholanic acids. Conversion of Oestrone to Oestriol, Oestrodinol and vice-versa. Structural elucidation of equilenin (synthesis not expected). Conformational structure of cholestane and Coprostane. General study of Bile acids and Prostaglandins.

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12. F. A. Carey and R. A. Sundberg, 'Advanced Organic Chemistry' (part A and B) plenum publishers, 2000.
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21. R. K. Mackie & D. M. Smith, Guide book to organic synthesis-ELBS.
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24. Paula Yurkanis Bruice, Organic Chemistry-Third Edition-Pearson Education Asia
25. Seyhan Ege, Organic chemistry-A.I.T.B.S.Publishers & Distributors (Regd.) Delhi.
26. Organic chemistry by Clayden, Greeves, Warren & Wothers.
27. Organic chemistry by John McMurry.
28. Organic chemistry by L.G. Wade. JR.
29. Named Organic reactions by Thomas laue & Andreas Plagens.

Inorganic Chemistry- IV

UNIT - I : SPECTRAL METHODS TO THE STUDY OF INORGANIC COMPOUNDS – II

Mossbauer spectroscopy: Principle – isomer shift (IS) – splitting of resonance lines: quadrupole splitting and magnetic hyperfine splitting. Applications: MB spectra of iron compounds/ complexes – structural elucidation, π - bonding effect, HS and LS determination, spin state crossover determination, cis–trans determination – nature of the complexes - mixed valence complexes. Tin compounds: MB spectra of Sn(II) and Sn(IV) compounds, oxidation states of Sn in its different compounds. MB spectra of iodine and ^{129}Xe containing compounds.

ORD AND CD - Optical isomerism in octahedral complexes– absolute configuration of chelate complexes from ORD and CD.

UNIT - II: SPECTRAL METHODS TO THE STUDY OF INORGANIC COMPOUNDS – III

Photo electron spectroscopy :Theory – types of PES –origin of fine structures – shapes of vibrational fine structures – adiabatic and vertical transitions – PE spectra of homo (like N_2 , O_2) and hetero nuclear diatomic molecules (like CO) - polyatomic molecules like H_2O , CO_2 , CH_4 , NH_3 . Evaluation of vibrational constants – Koopman's theorem - application and limitation of the theorem. XPS (ESCA): structure of N_3^- ion, CCl_3CH_3 , N(1s) spectrum of $[\text{Co}(\text{en})_2(\text{NO})_2]\text{NO}_3$, C(1s) spectrum of $\text{C}_2\text{H}_5\text{COOCF}_3$. Shake-up and shake-off processes – Structural and bonding information in metal carbonyls – Auger (OhJay) electron spectroscopy.

NQR spectroscopy - Applications of NQR spectroscopy -finger print technique. Investigating the electronic structure of molecules - information about EFG of nuclei - ionic character and hybridization of the bonds - structure of charge transfer complexes - Phase transition - hydrogen bonding.

UNIT III –BIOINORGANIC CHEMISTRY- I

Non-metals and metals in biological systems, essential and trace elements; classification of metallo-biomolecules, coordination environment and entatic state. Metallo porphyrins– chlorophyll and photo synthesis; cytochromes, hemoglobin, myoglobin and dioxygen binding, vitamin B_{12} and co-enzyme - *in vivo* and *in vitro* nitrogen fixation. Iron storage and transport: ferritin, transferrins and siderophores - iron proteins: hemerythrin, cytochrome P450 enzyme, ferredoxin and rubredoxin.

UNIT - IV: BIOINORGANIC CHEMISTRY - II

Copper proteins and Enzymes: plastocyanin, azurin, hemocyanin and ascorbic oxidase - different types of Cu present in proteins and enzymes. Zinc enzymes: carboxypeptidase A, carbonic anhydrase and superoxide dismutase. Inhibition and poisoning of enzymes illustrated by xanthine oxidase and aldehyde oxidase. Toxicity of metals and the role of metallothionins - excess and deficient levels of Cu and Fe and the consequent diseases - chelate therapy – metal complexes as drugs, anticancer and antiarthritic agents. Metal complexes as probes of nucleic acids.

UNIT – V: CHEMISTRY OF INORGANIC MATERIALS

Synthesis of inorganic materials – high temperature reactions and experimental methods – precipitation, gel, solution and hydrothermal methods, synthesis in sealed tubes and special atmospheres. Low temperature methods. Insertion compounds of metal oxides – Intercalation compounds of graphite and transition metal disulphides. Zeolites: structures and properties – pillared clays – fullerenes and fullerides.

REFERENCES:

1. R.S. Drago, *Physical Methods in Inorganic Chemistry*, Chapman and Hall Ltd., London, 1965.
2. R.S. Drago, *Physical Methods in Chemistry*, Saunders Golden Sunburst series.
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4. B.P.Straughan and S.Walker, *Spectroscopy* Volume 3, John Wiley and Sons Inc., Newyork, 1976.
5. G.H.Jeffery, J. Bassett, J. Mendham and R.C. Denney, *Vogel's Textbook of Quantitative Chemical Analysis*, Revised 5th edition, ELBS, 1989.
6. James E.Huheey, Ellen A.Keiter and Richard L.Keiter, *Inorganic Chemistry, Principles of Structure and Reactivity*, 4th Edition, Harper Collins College Publishers, 1993.
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10. I.Bertini, H.B.Gray, S.J.Lippard and J.S.Valantine, *Bioinorganic Chemistry*, Viva Books Pvt. Ltd., 1998.
11. Mark.T.Weller, *Inorganic Materials Chemistry*, Oxford Chemistry Press, Oxford Science Publications, Reprint 1996.
12. Inorganic chemistry by Catherine E. Housecroft.
13. Inorganic chemistry by Miessler.
14. NMR, NQR, EPR & MOSSBAUER spectroscopy in inorganic chemistry by R.V.Parish.
15. Biological inorganic chemistry: An introduction by Robert R.Chrichton.
16. Bioinorganic chemistry: A short course by Rosette M. Roat – Malone.

Physical Chemistry- IV

UNIT-I: CHEMICAL KINETICS I

Potential Energy surfaces-energy of activation. Thermodynamic treatment-statistical mechanism and chemical equilibrium- Kinetics of some reactions. Theories of reaction rates: Collision theory-steric factor. Absolute Reaction Rate Theory (ARRT)-derivation of rate equations and application of ARRT to bimolecular processes. Comparison between collision and Absolute Reaction Rate theories. Unimolecular reactions; Lindemann - Christiansen hypothesis, Hinshelwood, RRK, RRKM and Slater theories. Rate expressions for opposing, parallel and consecutive reactions. Chain reactions and its characteristics-steady state treatment, kinetics of H_2 - Br_2 reactions, formation of Phosgene-decomposition of N_2O_5 . Rice-Herzfeld mechanism, Explosive reactions: H_2 - O_2 reaction.

UNIT-II : CHEMICAL KINETICS - II

Reactions in solution: factors determining reaction rates in solutions, effect of dielectric constant and ionic strength, cage effect, Brønsted-Bjerrum equation, primary and secondary kinetic salt effect, influence of solvent on reaction rates, significance of volume of activation. Fast reaction kinetics- Flow techniques - relaxation theory and relaxation techniques - Temperature, Pressure, electric field and magnetic field jump methods; Flash photolysis and pulse radiolysis. NMR and ESR methods of studying fast reactions.

UNIT-III : SURFACE CHEMISTRY & CATALYSIS

Introduction: Adsorption- Physisorption and chemisorptions. Adsorption isotherms: Freundlich, Langmuir, BET and Gibbs adsorption isotherms. Surface area determination. ARRT to surface reactions. Micelles: Micelles and reverse micelles- micro emulsion-solubilisation.

Catalysis: Homogeneous catalysis- acid-base catalysis- van't Hoff and Arrhenius complexes for protropic and protolytic mechanisms. Bronsted catalysis law- Hammett acidity function. Heterogeneous catalysis. Chemical reactions on solid surfaces. Enzyme catalysis: Michaelis - Menton kinetics- Rate of enzyme catalyzed reaction- effect of substrate concentration, pH and temperature on enzyme catalyzed reactions.

UNIT-IV: POLYMER CHEMISTRY Polymers – definition – types of polymers – liquid crystalline polymers. Molecular mass- number and mass average molecular mass – determination of molecular mass (osmometry, viscosity, diffusion, light scattering, and sedimentation methods). Visco-elasticity, Rubber elasticity. Kinetics and mechanism of linear stepwise polymerization – addition polymerization – free radical, cationic and anionic polymerization. Kinetics of co-polymerization. Polymerization in homogeneous and heterogeneous systems. Stereochemistry and mechanism of polymerization.

UNIT-V: PHOTOCHEMISTRY AND RADIATION CHEMISTRY:

Photochemistry- Introduction. Laws of photochemistry, Quantum yield and its determination. Physical properties of electronically excited molecules: excited state dipole moment, acidity constant and redox Potentials. Photo physical processes in electronically excited molecules: Jablonskii diagram – Intersystem system crossing internal conversion, fluorescence, phosphorescence and other deactivation processes. Photo sensitization chemiluminescence and bioluminescence-Stern-Volmer equation and its applications – mechanisms of quenching – electron transfer – energy transfer–experimental techniques in photochemistry –chemical actinometers.

Radiation Chemistry-Differences between radiation chemistry and photochemistry – sources of high energy radiation and interaction with matter – radiolysis of water, solvated electrons – Definition of G-value- Dosimetry and dosimeters in radiation chemistry- applications of radiation chemistry in industries and biology.

REFERENCES

1. Chemical Kinetics and Dynamics; Jeffrey I Steinfeld, Joseph S. Francisco and William L. Hase. Prentice Hall, 2nd edition, 1998.
2. Laidler, K. J.; "Chemical Kinetics", 3rd Edition 1997 , Benjamin-Cummings. Indian reprint - Pearson 2009.
3. R.G.Frost and Pearson, Kinetics And Mechanism, Wiley, New York,1961.
4. W.J.Moore and R.G.Pearson, Kinetics And Mechanism,1981.
5. C.Capellos and B.J.J.Bielski,Kinetics Systems,Wisely Inter Science,New York, 1972.

6. Ambur and G.G.Hammes, Chemical Kinetics, Principles And Selected Topics, Mcgraw Hill, New York, 1968.
7. G.M.Harris, Chemical Kinetics, D.C.Heat And Co.,1966.
8. G. L. Agarawal, Basic Chemical Kinetics, Tata McGraw Hill, 1990.
9. G. D. Billing & K. V. Mikkelson, Molecular Dynamics and Chemical Kinetics, John Wiley, 1996.
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14. H. Kuhn, H.-D. Forsterling, D.H. Waldeck, Principles of Physical Chemistry, Wiley, 2009.
15. G.A. Somorjai, Y. Li , Introduction to Surface Chemistry and Catalysis (2n ed.), 2010.
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17. A.Zangwill, Physics at surfaces, Cambridge university Press (1988).
18. Manas Chanda, Advanced Polymer Chemistry, Marcel Dekker, Inc.New York 2000.
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27. P.J. Flory, Principles of Polymer Chemistry, Cornell Press, Ithaca, 1971.
28. Degennes, P.G. Scaling, Concepts in Polymer Physics, Cornell University Press, 1979.
29. Young, R.J. and Lovell, P.A. Introduction to Polymers, 2nd Edn., Chapman Hall,1991.
30. H.K. Moudgil, Text Booq of Physical Chemistry, PHI Learning, New Delhi, 2010.
31. Fundamentals of Photochemistry, K.K. Rohatgi Mukherjee, Wiley Eastern Limited (1986)
32. Photochemistry, Carol E Wayne and Richard P Wayne, Oxford University Press (1996)
33. Molecular Reactions and Photochemistry, C H Deputy and D S Chapman, Prentice Hall India, New Delhi (1st Edition) , 1972.
34. R.P.Wayne, Photochemistry, Butterworths,London(1970)
35. G.Hughes, Radiation Chemistry, Oxford University Press (1973)
36. J.W.T Spinks and R.J. Woods, Introduction to Radiation Chemistry, 2nd edn., John Wiley & Sons (1976).

Organic Chemistry Practical

- ❖ Estimations, two stage preparations and chromatographic techniques have been included as the practical components.
- ❖ Microscale preparations are recommended for the simple reason, they are both economic-friendly and eco-friendly

A. List of Estimations

1. Ethyl methyl ketone
2. Glucose-Lane Eynon and method
3. Glucose-Bertrand's method
4. Saponification value of oil
5. Iodine value of oil
6. Determination of Percentage purity in an unsaturated acid.
7. Purity of Glucose

B. List of Two stage preparations

1. Benzaldehyde \longrightarrow Benzoic acid \longrightarrow m-nitro benzoic acid
2. Acetanilide \longrightarrow p-acetanilide \longrightarrow p-Bromoaniline
3. Methyl benzoate \longrightarrow m-nitro methyl benzoate \longrightarrow m-nitro benzoic acid
4. Acetanilide \longrightarrow p-nitro acetanilide \longrightarrow p-nitroaniline
5. Benzophenone \longrightarrow Benzo phenone oxime \longrightarrow Benzanilide
6. Benzophenone \longrightarrow Benzpinacol \longrightarrow Benzpinacolone
7. Phthalic acid \longrightarrow Phthalic anhydride \longrightarrow Phthalimide
8. Thiourea \longrightarrow s-benzyl isothiuronium chloride s-Benzyl-isothiuronium benzoate
9. Aniline \longrightarrow Tri bromoaniline \longrightarrow Sym-Tribromobenzene

Students are expected to submit at the time of practical examination at least eight recrystallised samples of the final products, for evaluation by the examiners.

C. For Class Work Only

(I)Chromatographic techniques

1. TLC of Nitroaniline
2. TLC of Analgesic Drug
3. Column Chromatography-Separation of leaf pigments
4. Paper Chromatography-Analysis of Inks and Dyes

(II)Spectral analysis:

5. Interpretation of H^1 NMR spectra of pure ethyl alcohol and aqueous ethyl alcohol.
6. DEPT spectra of isopentyl acetate.
7. Mass spectrum of Anisole, Phenol and Crotonaldehyde

N.B: 1.Section -C is course work only.

2. It is for the purpose of internal assessment only.

REFERENCES

- 1.F.C.Mann and B.C.Saunders, Practical organic chemistry, Fourth edition, ELBS,1970
- 2.A.I. Vogel, A Text book of Practical organic chemistry.
3. A.I. Vogel, A Text book of Quantitative Organic Analysis,1989.
4. Raj K. Bansal,Laboratory Manual of Organic Chemistry,Second Edition,Wiley Eastern Ltd., 1990.
- 5.Moore, Dalrympk and Rodig, Experimental methods in organic chemistry, 3rd edition, Saunders College publishing, The Oxford Press,1982.
- 6.Bassett et.al., A Text Book of Quantitative Inorganic Analysis,ELBS, 1986
- 7.Roberts, Gilbert, Reidwald-Wingrove An Introduction to Experimental Organic Chemistry, 1969 .
- 8.V.K.Srivastava and K.K.Srivastava, Introduction to Chromatography-Theory and Practice, S.Chand & Co., 1987.

Practical-V

Inorganic Chemistry Practical

I. Quantitative estimation of a mixture containing two metal ions (Volumetric and Gravimetric Estimations).

1. Estimation of Cu^{2+} and Ni^{2+} ions.

2. Estimation of Cu^{2+} and Zn^{2+} ions.

3. Estimation of Fe^{2+} and Cu^{2+} ions .

4. Estimation of Fe^{2+} and Ni^{2+} ions .

5. Estimation of Ca^{2+} and Mg^{2+} ions.

6. Estimation of Ca^{2+} and Ba^{2+} ions .

7. Analysis of ores and alloys (course work only)

Note: For examination , a mixture may be given from which one cation is to be estimated volumetrically and the other gravimetrically .

II . Preparation of single stage inorganic complexes (a minimum of 10 complexes).

Note : Characterisation of any two metal complex prepared during the practicals by UV or IR spectral techniques (course work only)

Practical- VI

Physical Chemistry Practical

I. Potentiometric titrations-

- (a) Acid alkali titrations.
- (b) Precipitation titrations (a) Mixture of Cl^- and I^- vs Ag^+
- (c) Redox titrations (a) Fe^{2+} vs $\text{Cr}_2\text{O}_7^{2-}$
(b) Fe^{2+} vs Ce^{4+}
(c) I^- vs KMnO_4
- (d) Determination of dissociation constant of weak acids.
- (e) Determination of solubility product of sparingly soluble silver salts.
- (f) Determination of activity and activity coefficient of ions.
- (g) Determination of pH of a buffer solution using a quin hydrone electrode.

II. Titration using pH meter

- (a) Determination of dissociation constant of dibasic acid.

III. Freundlich Adsorption isotherm

- (a) Adsorption of oxalic acid/acetic acid on charcoal.

IV. Kinetic studies

- (a) Kinetics –acid hydrolysis of ester –comparison of strength of acids.
- (b) Kinetics –Persulfate –Iodide –clock reaction-primary salt effect.

REFERENCES: (Practical I and II)

1. J.B.Yadav, “ Advanced Practical Physical chemistry”, 20th Edn., GOEL publishing House, Krishna Pakashan Media Ltd., (2001).
2. Findlay’s “Practical Physical Chemistry” Revised and edited by B.P. Levitt 9th Edn., Longman, London, 1985.
3. J.N. Gurtur and R.Kapoor, “Advanced Experimental chemistry”, Vol.I. Chand & Co., Ltd., New Delhi.
4. W. J. Popiel, Laboratory Manual of Physical Chemistry, ELBS, London, 1970.
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Project work and viva – voce

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.Sc Computer Science

(Choice Based Credit System)

(with effect from the academic year 2016- 2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem	Sub 'Pr. No.	Subject status	Subject Title	Hrs/ week	Cre - dits	Marks				
						Maximum			Passing minimum	
						Int.	Ext	Tot.	Ext.	Tot
III	15	Core – 9	Research Methodology	4	3	25	75	100	38	50
	16	Core – 10	Digital Image Processing	4	3	25	75	100	38	50
	17	Core – 11	Soft Computing	4	3	25	75	100	38	50
	18	Core - 12	Soft ware Testing	4	3	25	75	100	38	50
	19	Elective – III (Choose any one)	a. Principles of Compiler Design b. Big Data Analytics c. Mobile Computing	4	4	25	75	100	38	50
	20	Practical –V	Image Processing using MATLAB	5	4	50	50	100	25	50
	21	Practical – VI	Software Development Lab	5	4	50	50	100	25	50
IV	22	Project	Major Project	--	18	50	50	100	25	50

Research Methodology

Unit – I

Research Methodology : Introduction - Meaning of Research – Objectives of Research – Types of Research – Motivation of Research – Research approaches – Significance of Research – Research Methods versus Methodology – Research and Scientific method – Research process – Criteria of good Research – Problems encountered by Researchers in India. Defining the Research problem : What is a Research problem - Selecting the Problem – Technique involved Defining a problem. Research design : Meaning – Need for Research Design – Features of Good Design – Important concept relating to Research design – Different Research designs – Basic Principles of Experimental Designs.

Unit – II

Sampling Design : Census and sample survey – Implications of a sample design – Steps in sample design - Criteria of selecting a sampling procedure – Characteristics of a good sample design – Different types of sample design – How to select a random sample – Random sample from an infinite Universe – Complex random sampling designs. Measurements and scaling techniques : Measurement in Research – Measurement scales – Sources of error in Measurement – Test and sound Measurements – Technique of developing measurement tools – Scaling, Meaning of scaling – Scale classification bases – Important scaling techniques – Scale Construction techniques.

Unit – III

Chi-Square Test for large samples – Definition of Chi-Square – Limitations of Chi-Square test - Chi-Square test as a test of goodness of fit and as a test of independence – Yate's correction and its applications – Analysis of variance(ANOVA) : Concept – One way ANOVA – ANOVA in test in Latin Square Design

Unit – IV

Data Collection : Methods of Data collection – Collection of Primary Data – Observation Method – Interview method – Collection of data through Questionnaires – Collection of data through Schedules – Some other methods of data collection – Collection of secondary data – Selection of appropriate method for data collection.

Interpretation and Report Writing : Meaning of interpretation – Why interpretation – Technique of interpretation – Precaution in Interpretation – Significance of Report Writing – Different Steps in Writing Report – Layout of the Research Report – Types of Reports – Mechanics of Writing a Research Report – Precautions for Writing Research Reports.

Unit – V

Algorithmic Research : Introduction – Algorithmic Research Problems – Types of Solution Procedure/ Algorithm – Steps of Development of Algorithm – Steps of Algorithmic research – Design of Experiments and Comparison of Algorithms – Meta Heuristics for Combinational Problems. The computer – Its role in Research – The Computer and Computer Technology – The Computer System – Important Characteristics - Computer Applications – Computer and Researchers.

Text Books

1. C.R.Kothari, “Research Methodology Methods and Techniques”, Second edition, New Age International Publishers, 2010.
2. R.Panneerselvam, “Research Methodology”, PHI, 2009.

References

1. S.P.Gupta, Introduction to Mathematical Statics”
2. D.K.Bhattacharyya, “Research Methodology”, First Edition, EBP, 2003.
3. Sancheti and Kapoor, “Business Statics”.

Digital Image Processing

Unit - I

Introduction : Fundamentals - The MATLAB Desktop - Using Mat lab Editor /Debugger- getting help-saving and Retrieving work session data - Digital Image Representation - Image I/O and Display – Classes and Image Types - M-Function Programming.

Intensity Transformation and Spatial Filtering : Background - Intensity transformation - histogram Processing and function Plotting - Spatial filtering - Image processing toolbox standard spatial filters.

Unit - II

Filtering in Frequency Domain : The 2-D Discrete Fourier transform - Computing and Visualizing the 2-D DFT in MATLAB – Filtering in the Frequency domain - Obtaining frequency domain filters from spatial filters - High pass (sharpening) frequency domain filters.

Image Restoration and Reconstruction : A model of the image degradation / restoration process - Noise models - Restoration in the presence of Noise only – Periodic Noise reduction using Frequency Domain Filtering – Modeling the Degradation Function - Direct Inverse Filtering - Wiener filtering.

Unit - III

Color Image Processing : Colour image representation in MATLAB - converting to other color spaces - The basics of color image processing - Color transformation - Spatial Filtering of colour images.

Working directly in a RGB vector space Wavelets : Background - The fast wavelet transform - Working with wavelet decomposition structures - The inverse wavelet transform - Wavelets in image processing.

Unit - IV

Image Compression : Background - Coding Redundancy - Spatial Redundancy - Irrelevant information- JPEG Compression.

Morphological image Processor : Preliminaries - Dialation and Erosion - Combining Dialation and erosion - Labelling connected components – Morphological reconstruction - Gray scale morphology.

Unit - V

Image Segmentation : Image segmentation - Point, line and edge detection - Line detection using the Hough transform – Thresholding – Region - Based segmentation using the Watershed transform.

Representation and Description : Background – Representation - Boundary Descriptors.

Text Book

1. Rafael C.Gonzalez, Richard E.Woods and Steven L.Eddins , “Image Processing Using MATLAB” ,Second edition, Tata McGraw Hill Education Private Limited, 2011.

References

- 1.Anil.K.Jain, Fundamentals of Digital Image Processing, Prentice-Hall, 1989.
- 2.Chanda & Majumdar, Digital Image Processing and Analysis, Prentice Hall ,3rd Edition
- 3.S.Sridhar, Digital Image Processing,Oxford University Press 2011

Soft Computing

Unit - I

Artificial Neural Network : Basic Concepts of Neural networks - Evolution of Neural networks - Basic Models of Artificial neural network - Terminologies of ANN- McCulloch - Pitts Neuron - Linear separability - Hebb Network - Applications of Neural networks.

Supervised learning Network : Introduction – Perceptron Networks – Adaptive Linear Neuron – Multiple Adaptive Linear Neurons – Back propagation Network – Radial Basis function Network.

Unit - II

Associative Memory Networks : Introduction – Training algorithms for pattern association – Auto associative Memory Network – Bidirectional Associative Memory – Hopfield Networks.

Unsupervised Learning networks: Introduction – Fixed Weight Competitive Nets - Kohonen Self-Organizing Maps – Learning Vector Quantization – Adaptive Resonance Theory Network.

Unit - III

Introduction to Classical Sets and Fuzzy Sets : Introduction - Classical sets - Fuzzy Sets. Classical Relation and Fuzzy Relations :- Introduction - Cartesian product of a relation - Classical Relation - Fuzzy Relations. Membership Functions : Introduction - Features of Membership Functions – Fuzzification - Methods of Membership Value Assignments. Defuzzification : Introduction - Lambda-Cuts for Fuzzy Sets - Lambda-Cuts for Fuzzy Relations - Defuzzification Methods.

Unit - IV

Fuzzy Arithmetic and Fuzzy Measures : Introduction - Fuzzy Arithmetic - Extension principles – Fuzzy measures. Fuzzy Rule Base and Approximate Reasoning : Introduction- Truth values and Tables in fuzzy logic - Fuzzy properties - Formation of rules- Decomposition of rules - Aggregation of Fuzzy rules - Fuzzy reasoning - Fuzzy Inference Systems. Fuzzy Decision Making : Individual Decision Making - Multiperson Decision Making - Multiobjective Decision Making - Multiattribute Decision Making. Fuzzy Logic Control Systems : Introduction - Control System Design - Architecture and Operation of FLC System - FLC System models.

Unit - V

Genetic Algorithms : Introduction - Basic Operators and Terminologies in GAs - Traditional Algorithm vs. Genetic Algorithm - Simple GA - General Genetic algorithm - The Schema Theorem - Classification of Genetic Algorithm - Holland Classifier Systems - Genetic Programming - Applications of Genetic Algorithm.

Applications of Soft Computing : Introduction - A Fusion approach of Multispectral Images with SAR Image for Flood area Analysis - Optimization of TSP using Genetic Algorithm Approach.

Text Book

1. S.N Sivanandam and S.N Deepa, “Principles of Soft Computing”, Wiley –India, 2007.

References

1. S.Rajasekaran and G.A.V.Pai, “Neural Networks, Fuzzy Logic and Genetic Algorithms”, PHI, 2004.
2. J.S.R.Jang, C.T.Sun and E.Mizutani, “Neuro-Fuzzy and Soft Computing”, PHI,Pearson Education 2004.
3. S.N.Sivanandam, S.N.Deepa, “Introduction to Genetic Algorithms”, Springer, 2007.
4. Timothy J.Ross, “Fuzzy Logic with Engineering Application”, McGraw Hill, 2000.
5. Davis E.Goldberg, “Genetic Algorithms: Search, Optimization and Machine Learning”, Addison Wesley, N.Y., 2003.

Software Testing

Unit – I

Introduction to Software Quality Engineering : What is software quality – Benefits of software quality – Software development life cycle model – Types of defects – Definitions used in software quality engineering - Software Quality Assurance and Quality Control - Software Configuration Management (SCM). Software Quality Assurance : Benefits of SQA – Role of SQA – SQA people – SQA plan – What is process – Process frame works.

Reviews, Inspections and walkthroughs : Management and Technical reviews - Inspections and walkthroughs – Inspection forms and check lists – Rate of Inspection – Inspection metrics- Estimating total number of defects in the software.

Unit – II

Introduction to Testing : Guiding Principles of testing – Composition of testing team – Essential skills of a tester – Types of Testing – Evaluating the quality of test cases – Techniques for reducing number of test cases – Requirements for effective testing – Test Oracle – Economics of Software testing – Handling defects – Risk in software testing – Requirements traceability matrix.

White box (Structural) Testing : Introduction to control flow graph – Control flow testing – Basis path testing – Linear Code Sequence And Jump (LCSAJ) coverage or JJ –path coverage – Loop testing – Data flow testing – Slice-based testing – Pitfalls of white box testing – Tools for white box testing. Integration Testing : Types of Integration testing – Functional Decomposition based Integration – Call graph-based Integration – Path-based Integration – Smoke testing.

Unit – III

Functional Testing : Logic-based Testing – State Transition Testing – Use Case-based Testing – Syntax Testing – Domain Testing – Petry Net-based testing – Tools used in Functional testing. Non-functional, Acceptance and Regression Testing : Non-functional Testing – Acceptance Testing - Regression Testing.

Unit – IV

Testing of OO Software and Agile Testing : Basics of OO system – Overview of UML diagram – OO Testing – Quality Metrics for OO Software – Agile Testing. Test Management: Activities in Test Management – Evaluation of Test Effectiveness – Release Management – Tools used in Test management. Cloud Testing : Introduction to Cloud computing – Cloud testing – Testing as a Service(TaaS).

Unit – V

Test Automation : Advantages and disadvantages of test automation – Activities in test Automation - Test Automation Frame work – Tools for Test Automation – Script languages in Test Automation. Metrics for Software Quality : Categories of Software metrics – Metrics program – Types of Metrics – Some Commonly used Software Metrics.

Tools for Quality Improvement : Basic Quality Control Tool – Check sheet – Cause and effect Diagram – Pareto Diagram – Histogram – Scatter Plot – Run chart – Control Chart – Orthogonal defect Classification.

Text Book

1) Anirban Basu, “Software Quality Assurance, Testing and Metrics”, PHI, 2015.

References

1) Sandeep Desai, Abhishek Srivastava, “ Software Testing A Practical Approach”, PHI , 2016.

2) Srinivasan Desikan, Gopalaswamy Ramesh, “Software Testing Principles and practices”, Pearson, 2012.

3) Aditya P Mathur, “Foundations of Software Testing”, Pearson, 2011

Principles of Compiler Design

Unit – I

Introduction to Compiling : Language Processors, The Structure of a Compiler.

Lexical Analysis : The role of the lexical analyzer - Input buffering - Specification of tokens - Recognition of tokens – The Lexical Analyzer Generator Lex - Finite automata - Regular expression to finite automata – Design of Lexical Analyzer Generator - Optimization of DFA - based pattern matchers.

Unit - II

Syntax Analysis : The role of the parser - Context-free grammars - Writing a grammar - Top down Parsing - Bottom-up Parsing - LR parsers- Parser Generators. Run time environment : Storage Organization – Static Allocation of space.

Unit – III

Intermediate Code Generation : Variants of Syntax trees – Three Address code – Types and Declarations - Translation of Expressions – Type checking - Control flow - Back patching - Switch Statements - Procedure calls.

Unit – IV

Code Generation : Issues in the design of a code generator - The target language – Address in the Target Code – Basic Block and Flow graphs – Optimization of Basic Blocks - A simple code generator – Peephole Optimization.

Unit – V

Machine Independent Optimizations : Introduction to Optimization Techniques - Introduction to Data Flow analysis – Foundations of data flow analysis – Partial Redundancy Elimination - Loops in flow graph

Text Book

1. Alfred V. Aho, Monica S.Lam, Ravi Sethi and Jeffrey D. Ullman, “Compilers- Principles, Techniques, and Tools”, Pearson Education Asia, 2011.

References

1. A.V. Aho, Ravi Sethi, J.D. Ullman, Compilers - Principles, Techniques and Tools, Addison-Wesley, 2003.
2. Fischer Leblanc, Crafting Compiler, Benjamin Cummings, Menlo Park, 1988.
3. Kenneth C.Louden, Compiler Construction Principles and Practice, Vikas publishing House, 2004.
4. Allen I. Holub, Compiler Design in C, Prentice Hall of India, 2001.

Big Data Analytics

Unit - I

A new paradigm for big data: Scaling with a traditional database – Desired properties of a Big Data System-The problems with fully incremental architectures-Lambda Architecture-Recent Trends in Technology.

Batch Layer: DATA model for Big DATA - The properties of data- the fact-based model for representing data- Graph schemas.Data Model for Big Data: Why serialization framework? - Apache thrift – Limitations of serialization frameworks.

Unit - II

Data Storage on the batch layer: Storage requirements for the master dataset – Choosing a storage solution for the batch layer – How distributed file systems work – Storing a master dataset with distributed file system – Vertical partitioning – Low-level nature of distributed file systems – Storing the SuperWebAnalytics.com master dataset on a distributed file system.

Unit - III

Data storage on the batch layer : Illustration - Using the Hadoop Distributed File System – Data storage in the batch layer with Pail – Storing the master dataset for SuperWebAnalytics.com.

Batch layer : Motivating examples – Computing on the batch layer – Recomputation algorithms vs. incremental algorithms –Scalability in the batch layer – MapReduce: a paradigm for Big Data computing – Low-level nature of MapReduce-Pipe diagrams: a higher-level way of thinking about batch computation

Batch layer: Illustration: An illustrative example- Common pitfalls of data-processing tools – An introduction to JCascalog – Composition. An example batch layer: Architecture and algorithms: Design of the SuperWebAnalytics.com batch layer – Workflow overview – Ingesting new data – URL normalization – User-identifier normalization – Duplicate pageviews – Computing batch views.

Unit - IV

Serving layer: Performance metrics for the serving layer- The serving layer solution to the normalization/denormalization problem- Requirements for a serving layer database- Designing a serving layer for Super WebAnalytics.com – Contrasting with a fully incremental solution.

Serving layer: Illustration:Basics of ElephantDB – Building the serving layer for SuperWebAnalytics.com

Unit - V

Speed Layer Realtime views: Computing realtime views – Storing realtime views – Challenges of incremental computation – Asynchronous versus Synchronous updates – Expiring realtime views. Realtime views: Illustration: Cassandra’s data model – Using Cassandra. Queuing and stream processing: Queuing – Steam processing – Higher-level, one-at-a-time stream processing – SuperWebAnalytics.com speed layer.

Queuing and stream processing: Illustration: Defining topologies with Apache Storm – Apache Storm clusters and deployment –Guaranteeing message processing – Implementing the SuperWebAnalytics.com unique-over-time speed layer. Lambda Architecture in depth: Defining data systems – batch and serving layers – Speed layer – Query layer.

Text Book

1. Nathan Marz and James Warren, “Big Data Principles and best practices of scalable real-time data systems”, Manning publications co., Dreamtech Press, Edition 2016.

References

1. Viktor Mayer-Schönberger and Kenneth Cukier, “Big Data: A Revolution That Will Transform How We Live, Work, and Think”, Houghton Mifflin Harcourt, 2013
- 2.Zikopoulos, Paul and Chris Eaton, “Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, TMH, 2011.
3. Glenn J.Myatt, “Making Sense of Data”, John Wiley&Sons, 2007.

Mobile Computing

Unit – I

Introduction : Mobility of bits and bytes – Wireless the beginning – Mobile Computing – Dialogue control – Networks – Middleware and gateways – Applications and services – Developing mobile computing applications.

Mobile Computing Architecture : Architecture of Mobile Computing – Three Tire Architecture – Design Consideration for mobile computing - Making existing applications to mobile enabled.

Mobile Computing Through Telephony : Multiple Access procedure – Satellite Communication System - Mobile Computing Through Telephone – Developing an IVR Application – Voice XML –Telephony Application Program Interface.

Unit – II

Emerging Technologies : Introduction – Bluetooth – Radio Frequency Identification(RFID) – Wireless Broadband(WIMAX) – Mobile IP – Internet Protocol version 6(IPV6).

Global System for Mobile Co mmunication : Introduction – GSM Architecture – GSM Entities – Call Routing in GSM – PLMN interface – GSM addresses and identifiers – Network Aspects in GSM – Mobility Management – GSM frequency allocation – Personal Communication service – Authentication and Security.

Short Message Service : Mobile Computing over SMS - Short Message Service(SMS) – Value added Services through SMS – Accessing the SMS bearer.

Unit – III

General Packet Radio Service (GPRS) : Introduction – GPRS and Packet data Networking – GPRS Network Architecture - GPRS Network Operations – Data Services in GPRS – Applications for GPRS – Limitations of GPRS – Billing and Charging in GPRS – Enhanced Data rate for GSM Evaluation (EDGE).

Wireless Application Protocol : Introduction – WAP – MMS – GPRS Applications.

CDMA and 3G : Introduction – Spread Spectrum Technology – IS-95 – Wireless Data – Third Generation Networks – Applications of 3G.

Unit – IV

Wireless LAN : Wireless LAN Advantages – IEEE 802.11 Standards – Wireless LAN Architecture – Mobility in Wireless LAN – Deploying Wireless LAN – Mobile Adhoc Networks and Sensor Networks – Wireless LAN security – Wireless Access in Vehicular Environment – Wireless Local Loop – Hiper LAN – WIFI versus 3G.

Intelligent Networks and Interworking : Fundamentals of Call Processing – Intelligence in the Networks – SS#7 Signalling – IN Conceptual Model (INCM) – Softswitch – Programmable Networks – Technologies and Interfaces for IN.

Client Programming : Mobile Phones – Features of Mobile phones – PDA – Design constraints in Applications for Handheld devices – Recent Developments in Client Technology.

Unit – V

Programming for the PALM OS : History of PALM OS – PALM OS architecture – Application Development – Communication in PALM OS – Multimedia.

Wireless Devices with Symbian OS : Introduction to Symbian OS - Symbian OS Architecture – Security on Symbian OS.

Security Issues in Mobile Computing : Information Security – Security Techniques and Algorithms – Security Protocols – Public Key Infrastructure.

Text Book

1. Asoke K Talukder , Hasan Ahmed and Roopa R Yavagal, “Mobile Computing : Technology, Applications and Service Creation”, Second Edition , TMH, 2010

References

1.T.G. Palanivelu, R. Nakkeeran, Wireless and Mobile Communication, PHI Learning Private Limited, 2009

2.Raj Kamal, “Mobile Computing” ,Second Edition, Oxford University Press, 2012

3.Jochen Schiller, “Mobile Communications”, Second Edition, Pearson Education, 2007

4. William Stallings, “Wireless Communication and Networks”, Pearson Education Asia, 2002

Image Processing Using Mat Lab

Programs should include but not limited to:

1. Read and display digital Images.
2. Image Arithmetic Operations
3. Image Logical Operations
4. Geometric transformation of Image
5. Histogram Equalization.
6. Non-linear Filtering.
7. Edge detection using Operators.
8. 2-D DFT and DCT.
9. Filtering in frequency domain.
10. Conversion between color spaces.
11. DWT of images.
12. Segmentation.

MSU / 2016-17 / PG –Colleges / M.Sc.(Computer Science) / Semester -III / Ppr.no.21 / Practical VI

Software Development Lab

It is mandatory that the student should submit a report based on the software (Mini Project) developed on any one of the below mentioned topics:

- Android Applications
- Image Processing Applications
- Web Applications Using ASP.NET with C#

The internal mark shall be distributed as given below:

Internal Assessment Component	Marks
System Study	10
Execution	10
Report	5
Total	25

The external mark shall be distributed as given below:

External Assessment Component	Marks
Execution	30
Report	25
Vivi-voce	20
Total	75

MSU / 2016-17 / PG –Colleges / M.Sc.(Computer Science) / Semester -IV / Ppr.no.22 / Project

Major Project

The objective of the project is to enable the students to work in a project of latest topic / research area / industrial applications. Each student shall have a guide from the Department.

During this semester the students are expected to do literature survey, formulate the problem and form a methodology of arriving at the solution of the problem. Also during this semester, the students are expected to complete the project and submit a full-fledged report comprising of the complete system developed along with implementation and test results. The departmental committee shall examine the students for 25 marks and the evaluation is based on continuous internal assessment comprising of two reviews.

Internal Assessment Component	Marks
I Review on 50% Completion	10
Final Review	10
Report	5
Total	25

A Vivo-voce will be conducted by two External Examiners and the marks shall be contributed as per the under mentioned components.

External Assessment Component	Marks
Report	30
Presentation	25
Viva-voce	20
Total	75

MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI
PG - COURSES – AFFILIATED COLLEGES
 Course Structure for M.Sc Mathematics
 (Choice Based Credit System)
 (with effect from the academic year 2016- 2017 onwards)
 (44th SCAA meeting held on 30.05.2016)

Sem	Sub 'Pr. No.	Subject status	Subject Title	Hrs/ week	Cre - dits	Marks				
						Maximum			Passing minimum	
						Int.	Ext	Tot.	Ext.	Tot
III	9	Core – 7	Measure and Integration	8	6	25	75	100	38	50
	10	Core – 8	Topology	8	6	25	75	100	38	50
	11	Core – 9	Research Methodology	7	5	25	75	100	38	50
	12	Elective—III (Choose any one)	a.Partial Differential Equations b. Operations Research c.Wavelets	7	5	25	75	100	38	50
IV	13	Core – 10	Functional Analysis	8	6	25	75	100	38	50
	14	Core – 11	Complex Analysis	8	6	25	75	100	38	50
	15	Core - 12	Differential Geometry	8	6	25	75	100	38	50
	16	Project	Project	6	4	50	50	100	25	50

Measure and Integration

Unit I : Lebesgue Measure – Lebesgue Outer Measure – The σ - Algebra of Lebesgue Measurable sets – Outer and Inner Approximation of Lebesgue Measurable sets – Countable Additivity, Continuity and the Borel – Cantelli Lemma – Lebesgue Measurable functions – Sums, Products and Compositions.

Chapter 2 : Sec 2.1 – 2.5 and **Chapter 3 :** Sec 3.1

Problems : **Chapter 2 :** 1 – 12, 16 – 18 and **Chapter 3 :** 1 – 6

Unit II : Sequential pointwise Limits and Simple Approximation – Littlewood’s Three Principles, Egoroff’s Theorem and Lusin’s Theorem – Lebesgue Integration – The Riemann Integral – The Lebesgue Integral of a bounded Measurable function over a set of finite Measure – The Lebesgue Integral of a Measurable non – negative function – The general Lebesgue Integral – Countable Additivity and Continuity of Integration.

Chapter 3 : Sec 3.2 & 3.3 and **Chapter 4 :** Sec 4.1 – 4.5

Problems : **Chapter 4 :** 9 – 12, 16 – 20, 28, 30

Unit III : Differentiation and Integration – Continuity of monotone functions – Differentiability of monotone function : Lebesgue theorem – Functions of bounded variations : Jordan’s theorem – Absolutely continuous functions – Integrating Derivatives : Differentiating Indefinite Integrals.

Chapter 6 : Sec : 6.1 – 6.5 (**No problems**)

Unit IV : Measure and Integration – Measures and Measurable sets – Signed Measures : The Hahn and Jordan Decompositions.

Chapter 17 : Sec : 17.1 – 17.4

Problems : **Chapter 17 :** 1, 2, 5, 13, 14, 18 & 19

Unit V : Integration over general Measure spaces : Measurable Functions – Integration of non – negative Measurable functions – Integration of general Measurable function (Upto the Lebesgue Dominated Convergence theorem only).

Chapter 18 : Sec : 18.1 – 18.3

Problems : **Chapter 18 :** 1, 2, 4, 5, 6, 19, 21, 31, 32

Text Book : Real Analysis, Fourth Edition, H.L.Royden, P.M.Fitzpatrick, PHI Learning Private Ltd.

Topology

- Unit I :** Topological Spaces – Closed sets and limit points.
Chapter 2 : Sec : 12 – 17.
Problems : **Chapter 2 :** Sec 13 : All Exercise Problems,
Sec 16 : 1 – 6, Sec 17 : 1 – 16.
- Unit II :** Continuous Functions – Product Topology – Connected Spaces.
Chapter 2 : Sec : 18, 19, 23.
Problems : **Chapter 2 :** Sec 18 : 1 – 6, Sec 19 : 1 – 4, Sec 23 : 1 – 5.
- Unit III :** Compact Spaces – Local Compactness.
Chapter 3 : Sec : 26, 29.
Problems : **Chapter 3 :** Sec 26 : 1 – 6, Sec 29 : 1 – 3.
- Unit IV :** The Countability Axioms – The Separation Axioms – Normal Spaces.
Chapter 4 : Sec : 30, 31, 32.
Problems : **Chapter 4 :** Sec 30 : 1 – 3, Sec 31 : 1 – 4, Sec 32 : 1 – 4.
- Unit V :** The Urysohn Lemma – The Urysohn Metrization Theorem – The Tietze Extension Theorem.
Chapter 4 : Sec : 33 , 34, 35.
Problems : **Chapter 4 :** Sec 33 : 1 – 4, Sec 35 : 1 – 3.
- Text Book :** **Topology (Second Edition)**, James R Munkres, Prentice Hall of India Pvt. Ltd.

Research Methodology

Unit I : Research Project – Difference between a dissertation and a thesis – Basic requirements of a research degree – Writing a proposal – Ethical considerations – Different components of a Research Project – Literature review – Methodology – Results / data – Conclusions – Bibliography - Appendices.

Chapter 5 : Sec : 5.1 – 5.13, **Chapter 6 :** Sec : 6.1 – 6.7, 6.8 (6.8.1 only), 6.9 (6.9.1 only), 6.11, 6.12 (6.12.1 only), 6.13 in Book 1

Unit II : Some Special Distributions : The Gamma and Chi – Square distribution – The normal distribution.

Chapter 3 : Sec : 3.3, 3.4 in Book 2.

Exercise Problems : Chapter 3 : 3.28 – 3.35, 3.40 – 3.46, 3.49 – 3.54.

Unit III : Sampling Theory : Transformation of variables – t & F distributions.

Chapter 4 : Sec : 4.1 – 4.4 in Book 2.

Exercise Problems : Chapter 4 : 4.1 – 4.8, 4.14 – 4.17, 4.20 – 4.25, 4.34 – 4.41.

Unit IV : Change of variable technique – The MGF technique – Distributions of \bar{X} and $\frac{ns^2}{\sigma^2}$ - Expectations of functions of random variables.

Chapter 4 : Sec : 4.5 – 4.9 in Book 2.

Exercise Problems : Chapter 4 : 4.42, 4.43, 4.50, 4.51, 4.68 – 4.74, 4.83 – 4.93.

Unit V : Limiting distributions, Stochastic, Convergence – Limiting moment generating functions – The Central Limit Theorem – Some theorems on Limiting Distributions.

Chapter 5 : Sec : 5.1 – 5.5 in Book 2.

Exercise Problems : Chapter 5 : 5.1 – 5.3, 5.7, 5.8, 5.11 – 5.13, 5.15, 5.16, 5.20 – 5.27, 5.30 – 5.35.

Text Book : **1. Writing up your University Assignments and Research Projects – A Practical handbook**, Neil Murray and Geraldine Hughes, McGraw Hill Open University Press.

2. Introduction to Mathematical Statistics, Fourth Edition, Robert V. Hogg and Allen T.Craig, Pearson Education Asia.

Partial Differential Equations

Unit I : Simultaneous DE of First Order and First Degree in 3 variables – Methods of solutions of $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ - Orthogonal Trajectories of a system of curves on a surface – Pfaffian Differential Forms and equations – Solution of a Pfaffian DE in 3 variables.

Chapter 1 : Sec : 2 – 6. (all problems).

Unit II : Partial DE – Origin of First Order PDE – Linear equations of First Order – Integral surfaces passing through a given curve – Surfaces orthogonal to a given system of surfaces.

Chapter 2 : Sec : 1, 2, 4, 5, 6. (all problems).

Unit III : Cauchy's method of characteristics – Compatible systems of First Order equations – Charpit's Method – Special types of First Order equations.

Chapter 2 : Sec : 8, 9, 10, 11. (all problems).

Unit IV : Origin of Second Order equations – Second Order equations in Physics – Linear PDE with constant coefficients.

Chapter 3 : Sec : 1, 2, 4. (all problems).

Unit V : Characteristics of equations in 3 variables – Solution of linear hyperbolic equations – Separation of variables.

Chapter 3 : Sec : 7, 8, 9. (all problems).

Miscellaneous Problems are not included.

Text Book : Elements of Partial Differential Equations, I.N. Sneddon, McGraw Hill, New Delhi, 1983.

Operations Research

- Unit I :** **Transportation Models and its variants :** Definition Of The Transportation Model – Non Traditional Transportation Model – Transportation Algorithm – The Assignment Model.
Chapter 5 : Sections 5.1, 5.2, 5.3, 5.4 and **Exercise problems.**
- Unit II :** **Network Analysis :** Network Definitions – Minimal Spanning Tree Algorithm – Shortest Route Problem – Maximum Flow Model – CPM – PERT.
Chapter 6 : Sections 6.2, 6.3, 6.4, 6.5, 6.7 and **Exercise problems.**
- Unit III :** **Integer Linear Programming :** Introduction – Applications – Integer Programming Solutions – Algorithms.
Chapter 9 : Sections 9.1, 9.2, 9.3 and **Exercise problems.**
- Unit IV :** **Inventory Theory :** Basic Elements Of An Inventory Model – Deterministic Models: Single Item Stock Model With And Without Price Breaks – Multiple Items Stock Model With Storage Limitations – Probabilistic Models : Continuous Review Model – Single Period Models.
Chapter 11 : Sections 11.1, 11.2, 11.3, **Chapter 16 :** Sections 16.1, 16.2, 16.3 and **Exercise problems.**
- Unit V :** **Queueing Theory :** Basic Elements Of Queuing Model – Role Of Poisson And Exponential Distributions – Pure Birth And Death Models – Specialised Poisson Queues – (M/G/1) : (GD/ ∞ / ∞)- Pollaczek-Khintchine Formula.
Chapter 17 : Sections 17.2, 17.3, 17.4, 17.6, 17.7 and **Exercise problems.**
- Text Book :** **Operations Research (Sixth Edition) , Hamdy A. Taha,** Prentice Hall Of India Private Limited, New Delhi.

Wavelets

Unit I : Definition and basic properties of the Discrete Fourier Transform – Translation – Invariant Linear Transformation.

Unit II : Construction of Wavelets of Z_n – The First Stage.

Unit III : The Fourier Transform and construction of $L^2(Z)$ – First Stage Wavelets on Z .

Unit IV : $L^2(R)$ and approximation Identities – The Fourier Transform on R .

Unit V : Multi resolution Analysis and Wavelets – Construction of Multi resolution Analysis.

Chapter 2 : Sec : 2.1, 2.2

Chapter 3 : Sec : 3.1

Chapter 4 : Sec : 4.4, 4.5

Chapter 5 : Sec : 5.1 – 5.4

Text Book : **An Introduction to wavelets through Linear Algebra**, Michael W. Frazier, (Springer – Verlag).

Functional Analysis

Unit I : Banach Spaces – Definition and some examples – Continuous linear transformations – The Hahn – Banach Theorem – The Natural imbedding of N in N^{**} .

Chapter 9 : Sec : 46 – 49.

Problems : Chapter 9 : Sec 46 : 1 – 4, Sec 47 : 1 – 7, Sec 48 : 1 – 4, Sec 49 : 1 – 3.

Unit II : The Open Mapping Theorem – The conjugate of an operator – Hilbert Spaces – Definition and some simple properties – Orthogonal Complements.

Chapter 9 : Sec : 50, 51, **Chapter 10 :** Sec : 52, 53

Problems : Chapter 9 : Sec 50 : 1 – 3, Sec 51 : 1 – 3, **Chapter 10 :** Sec 52 : 1, 3, 4, 6, Sec 53 : 1 – 4.

Unit III : Orthonormal Sets – The Conjugate Space H^* - The Adjoint of an operator – Self – Adjoint operators.

Chapter 10 : Sec : 54 – 57.

Problems : Chapter 10 : Sec 54 : 1 – 5, Sec 55 : 1 – 3, Sec 56 : 1 – 4, Sec 57 : 1, 2.

Unit IV : Normal and Unitary Operators – Projections – Finite Dimensional Spectral Theory – Determinants and the Spectrum of an Operator – The Spectral Theorem.

Chapter 10 : Sec : 58, 59, **Chapter 11 :** Sec : 61, 62.

Problems : Chapter 10 : Sec 58 : 1 – 4, Sec 59 : 1 – 4, **Chapter 11 :** Sec 61 : 1, 2, Sec 62 : 1 – 5.

Unit V : General Preliminaries on Banach Algebras – Definition and Some examples – Regular and singular elements – Topological divisors of zero – The Spectrum – The formula for the Spectral radius – The Radical and Semi – simplicity.

Chapter 12 : Sec : 64 – 69.

No Problems.

Text Book : **Introduction to Topology and Modern Analysis**, G.F.Simmons, McGraw Hill International Editions.

Complex Analysis

- Unit I :** Analytic functions – Polynomials – Power series – Conformality.
Chapter 2 : Sec 1 : 1 – 4, Sec 2 : 4, 5, **Chapter 3 :** Sec 2 : 3, 4
Problems : **Chapter 2** – Sec 1.2 : 1 – 7, Sec 1.4 : 1 – 3 &
Chapter 3 – Sec 2.4 : 1 – 6
- Unit II :** Linear transformations – Symmetry – Family of curves – line integrable – line integrable as functions of arc.
Chapter 3 : Sec 3 : 1 – 5, **Chapter 4 :** Sec 1 : 1 – 3.
Problems : **Chapter 3** – Sec 3.1 : 1 – 4, Sec 3.2 : 1 – 3, Sec 3.3 : 1 – 8, Sec 3.5 : 1, 2, 3 & 6 & **Chapter 4** – Sec 1.3 : 1 – 7.
- Unit III :** Cauchy’s theorem for Rectangle – Cauchy’s theorem in a disc, Cauchy’s Integral formula, Index of a point – The integral formula – Higher derivatives.
Chapter 4 : Sec 1 : 4, 5, Sec 2 : 1 – 3
Problems : **Chapter 4** – Sec 2.2 : 1 – 3, Sec 2.3 : 1.
- Unit IV :** Taylor’s Theorem – Zeros and Poles – The local mapping – The maximum principle of Calculus of Residues.
Chapter 4 : Sec 3 : 1 – 4, Sec 5 : 1.
Problems : **Chapter 4** – Sec 3.2 : 1 – 4.
- Unit V :** The Argument Principle – Evaluation of definite integrals – Harmonic functions.
Chapter 4 : Sec 5 : 2, 3, Sec 6 : 1 – 3
Problems : **Chapter 4** – Sec 5.2 : 1 – 3, Sec 5.3 : 1 – 3, Sec 6.2 : 1, 2.
- Text :** Complex Analysis – Lars V.Ahlfors – Tata McGraw Hill (Third Edition)

Differential Geometry

- Unit I :** Definition of a space curve – Arc length – Tangent – Normal and Binormal – Curvature and Torsion.
Chapter 1 : Sec : 1.1 – 1.5.
Problems : Chapter 1 : Miscellaneous Exercise I : 1 – 5.
- Unit II :** Contact between curves and surfaces – Tangent Surface – Involutives and evolutes – Intrinsic equations – Fundamental Existence Theorem for space curves – Helices.
Chapter 1 : Sec : 1.6 – 1.9.
Problems : Chapter 1 : Miscellaneous Exercise I : 8 – 12.
- Unit III :** Definition of a surface – Curves on a surface – Surfaces of revolution – Helicoids – Metric – Direction Coefficients.
Chapter 2 : Sec : 2.1 – 2.6.
Problems : Chapter 2 : Miscellaneous Exercise II : 1 – 4.
- Unit IV :** Families of curves – Normal Property of geodesics – Geodesic Parallels.
Chapter 2 : Sec : 2.7, 2.10 – 2.12, 2.14.
Problems : Chapter 2 : Miscellaneous Exercise II : 6, 7, 8.
- Unit V :** The Second Fundamental form – Principal Curvature – Lines of Curvature – Compact Surfaces whose points are umbilics – Hilbert’s Lemma – Compact surface of constant curvature.
Chapter 2 : Sec : 2.15, **Chapter 3 :** Sec : 3.1 – 3.3 & **Chapter 4 :** Sec : 4.2 – 4.4.
Problems : Miscellaneous Exercise III : 1 – 5.
- Text :** **An Introduction to Differential Geometry**, T.J.Willmore, Oxford University Press, (17th Impression), New Delhi, 2002, (Indian Print).

MSU / 2016-17 / PG –Colleges / M.Sc.(Mathematics) / Semester –IV / Ppr.no.16 / Project

Project

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.Sc Microbiology

(Choice Based Credit System)

(with effect from the academic year 2016- 2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem	Sub 'Pr. No.	Subject status	Subject Title	Hrs/ week	Credits	Marks				
						Maximum			Passing minimum	
						Int.	Ext	Tot.	Ext.	Tot
III	11	Core -7	Research Methodology	6	5	25	75	100	38	50
	12	Core – 8	Medical and Pharmaceutical Microbiology	6	5	25	75	100	38	50
	13	Core – 9	Environmental and Agricultural Microbiology	6	5	25	75	100	38	50
	14	Elective III (Choose any one)	a. Taxonomy of Angiosperms and Ethan botany b. Morphology, Taxonomy & Economic Botany c. Developmental Biology and Evolution d.Horticulture e.Economic Entomology f.Bioinformatics and Biostistics	6	5	25	75	100	38	50
	15	Practical – III (Choose any one)	a.Taxonomy of Angiosperms and Ethan botany b. Morphology, Taxonomy & Economic Botany c. Developmental Biology and Evolution d.Horticulture e.Economic Entomology f.Bioinformatics and Biostistics	6	6	50	50	100	25	50
IV	16	Core -10	Food Microbiology	6	4	25	75	100	38	50
	17	Core – 11	Fermentation And Industrial Microbiology	6	4	25	75	100	38	50
	18	Core – 12	Biotechnology	6	4	25	75	100	38	50
	19	Project	Project	6	6	50	50	100	25	50
	20	Practical - IV	Practical	6	6	50	50	100	25	50

Based on the open elective paper the relevant practicals listed following the open elective theory papers should be merged with the concerned semester practical at last

Research Methodology

Unit: 1

Objectives – principles – types of research approaches – Research process – Criteria of good research – Research and Scientific method – Defining the Research problem – Selecting the problem – Techniques in defining the problem.

Unit: II

Importance and need for research ethics and scientific research - Formulation of hypothesis – Types and characteristics – Hypothesis testing – Procedures.

Unit: III

Designing a research work – Need of research design – Features of a good design – Concepts and different research design – Basic principles of experimental design.

Unit: IV

Interpretation and report writing. Meaning – Techniques and significance of report writing – Steps - Types of report – Oral presentation.

Unit: V

Scientific writing – Characteristics – Logical format for writing thesis and papers – Essential features of abstract, introduction, review of literature, materials and methods, results and discussion. Effective illustration – Tables and figures – Plates – Conclusion and Bibliography – Application of computer in research.

Textbooks recommended:

1. Vijayalekshmi, G. and C. Sivapragasam (2008). Research Methods (Tips and techniques). MJP Publishers, Chennai.
2. Gurumani, N. (2006). Research methodology for Biological Sciences. MJP Publishers, Chennai.

Medical and Pharmaceutical Microbiology .

Unit: I

Etiology, transmission, pathogenesis, clinical manifestation, lab diagnosis, chemotherapy and prophylaxis of respiratory tract infections – upper respiratory tract infections (Streptococcal pharyngitis, Diphtheria) and lower respiratory tract infections.(Tuberculosis and bacterial pneumonia)- Urinary tract infections - Sexually transmitted infections.(Syphilis, Gonorrhea)- Gastro intestinal infections –(Bacteria-*E.coli*,*Salmonellasp*,*Shigellasp*,*Vibriosp*, Protozoan-*E.histolytica*-Viral-Rotaviruses).

Unit: II

Studies on central nervous system infections (Bacterial:meningitis and tetanus)-Skin infections (Bacterial:PyogenicStaphylococcal and Streptococcal)-Mycobacterial disease(leprosy) – Vector borne infections (Rickettsial infections) – Protozoa infections (Malaria) – Fungal infections (Dermatophytosis, Candidiasis) – Viral infections (Rabies, Poliomyelitis).

Unit: III

Emerging infectious diseases: Emerging bacterial and viral infections – SARS – Avian – H1N1 influenza –Chikungunya,Dengue, Ebola – Zika

Unit: IV

Pyrogentesting - Sterility and toxicity test – Antimicrobial testing (Kirby- Bauer method) – MICand MBC – Types of disinfectants, antiseptics and sanitizers – Factors influencing the selection of drugs. (Dose, route, toxicity and combined therapy) – Drug resistance in microbes.

Unit: V

Standards of drugs: IP, BP, EP, and USP – sterility testing of parental products (solid and liquid products) - Sterility testing of pharmaceutical products - Sterility testing of sterile surgical device, dressings absorbable, hemostats, surgical ligatures, suture and surgical catgut.

References

1. Ananthanarayanan, R., and Panicker, J. (2000). Text Book of Microbiology. Orient Longmans.
2. Rajan, S. (2007). Medical microbiology. MJP Publisher, Chennai
3. Bernard D. Davis, Renato Dulbecco, Herman N. Eisen and Herold, S. Ginberg, (1990), Microbiology (4th Edition), J.B. Lippincott Company, New York.
4. Prescott L.M. Harley J.P., and Klein D.A (2008). Microbiology (7th Edition). McGraw Hill, New York.
5. Larry MO Kane and Judy Kandel (1996), Microbiology – Essentials and Applications. (2nd Edition).
6. Madigan M.T., (Martinko, J.M., and Parker J., Brock TD. (1997). Biology of Micoorganisms. (8th Edition). Prentice Hall international Inc, London.
7. Mariappan C. and Murugesan A.G., (2010), Pharmaceutical microbiology and quality control theory and techniques. Nalini Publishers, India.
8. Nester, E.W., Roberts, C.V., and Nester, M.T. (1995). Microbiology, A Human Perspective. IWOA, U.S.A.
9. Salle, A.J. (1996). Fundamental Principles of Bacteriology. (7th Edition). Tata MoGraw Hill, Publishing Company Ltd, New Delhi.
10. Pelczer Jr., M.J. Chan E.C.S., and Kreig N.R. (1993). Microbiology. McGraw Hill, Inc., New York.
11. Stainer R.Y., Ingraham J.L., Wheels M.L., and Painter P.R (1986). General Microbiology, ManoMillan Education Ltd, London.
12. Starr, M.P., Stolp, H., Truper H.C., Ballows, A., and Schegel, H.C. (1991). The Prokaryotes. A Hand Book of Habits, Isolation and Identification of Bacteria, Springer Verlag.
13. Larry Mckane and Judy Kandel (1996). Microbiology – Essentials and Applications. (2nd Edition). McGraw – Hill Inc, New York.
14. Madigan M.T., Martinako, J.M. and Parker J Brock T.D. (1997). Biology of Microorganisms. (8th Edition). Prentice Hall International Inc, London.
15. Nester, E.W., Roberts, C.V., and Nester, M.T. (1995). Microbiology, A Human Perspective. IWOA; U.S.A.
16. P. Saravanan (2006). Virology, MJP Publishers, Chennai.
17. Luria S.E, and Darnel, J.E Jr., Baltimore, D., and Campbell, A. (1978). General Virology, (3rd Edition) John Wiley and Sons, New York.
18. Dimmock – Virology.
19. Rhodes and Van Royen –Text Book of Virology.
20. Biswas and Biswas – An Introduction to Viruses.
21. Ananth Rai – Animal Viruses.
22. Green Wood – Text Book of Virology.
23. Purohit, S.S., Saluja. A.K., and Kakrani. H.N., (2003) Pharmaceutical Microbiology. Student Edition (Publ), Jodhpur.
24. Purohit. S.S., Saluja. A.K., and Kakrani. H.N. (2003). Pharmaceutical Biotechnology. Student Edition (Publ), Jodhpur.
25. Jai, N.K., Pharmaceutical Microbiology.
26. Hugo. W.B. Pharmaceutical Microbiology.

Environmental and Agricultural Microbiology

Unit I:

Soil microbiology: soil structure and profile – Classification of soil – Physical and Chemical characteristics- Micro flora of various soil types – Quantification of soil micro flora – Factors affecting microbial community in soil – Biogeochemical cycles – Carbon, nitrogen, phosphorus and sulphur cycles).

Unit II:

Aero microbiology: Droplet nuclei – aerosol – Assessment of air quality – Solid and liquid impingement method – Airborne transmission of microbes – Diseases and preventive measures (Bacteria, fungi and viruses).

Unit III:

Aero microbiology: Aquatic environment – Freshwater habitats (ponds – lakes) marine habitats (mangroves, deep sea, hydrothermal vent –Pot ability of water, microbial assessment of water quality – waterborne diseases and control measures – water pollution Eutrophication.

Unit IV:

Rhizosphere effects – R/S ratio – Rhizoplane – Biofertilizers and role in agriculture – Bacterial – (Rhizobium, Azotobacter, Azospirillum and phosphobacteria). Algae (Blue green Algae) – and Fungi (VAM) – Biofertilizers.

Unit V:

Important diseases of horticultural crops – Symptoms – Etiology, lifecycle and management- Bacterial leaf blight of Paddy, Late blight of Potato – Apple scab – stem rust of wheat – Transgenic plants for crop improvement – Biocontrol agents of bacteria, fungi and virus.

Textbooks recommended:

1. Rangasamy. G., and Bagyaraj. D.J. (1996). Agricultural Microbiology. Prentice – Hall of India Pvt Ltd., New Delhi.
2. Atlas, R.M., and Bartha.M. (2003). Microbial Ecology – Fundamentals and applications. Benjamin – Cummings, Menlo Park,California.
3. Talaro, K.P. and Talaro. A (1999). Foundations in Microbiology. WCB Mc Graw Hill New York.
4. Dirk, J. Elsas, V., Trevors, J.T., and Wellington, E.M.H (1997). Modern Soil Microbiology. Marcel Dekker INC, New York, Hong Kong.
5. Grant W.D. and Long, P.L. (1981). Environmental Microbiology. Blackie Glasgow and, London.
6. Mitchel, R. (1992). Environmental Microbiology Wiley – John Wiley and Sons. Inc. Publications, New York.
7. Vijaya Ramesh, K. (2004). Environmental Microbiology. MJP Publishers, Chennai.
8. Moshrafucidin Ahamed and Basumatary, S.K. (2006). Applied Microbiology MJP Publishers, Chennai.
9. Rajednran. P., and Gunasekaran. P, (2006) Microbial Biormediation. MJP Publishers Chennai.
10. Kalaiselvan, P.T. Arul Pandi. I. (2007). Bioprocess Technology. MJP Publishers, Chennai.
11. Benard D. Davis, Renato Dulbercco, Herman N. Eisen and Harold, S. Ginberg. (1990). Microbiology. (4th Edition). J.B. Lppincott Company, Now York.
12. Prescott. L.M., Harley J.P., and Klein D.A. (2008). Microbiology. (7th Edition McGraw Hill, New York.
13. Larry Mc Kane and Judy Kanel. (1996). Microbiology – Essentialsand Applications. (2nd Edition). McGraw-Hill Inc, New York.
14. Madigan M.T., Martinko. J.M., and Parker J., Brock TD. (1997). Biology of Microorganisms, (8th Edition). Prentice Hall International Inc, London.
15. Nester, E.W., Robeerts, C.V., and Nester, M.T. (1995). Microbiology – A Human Perspective. IWOA, U.S.A.
16. Salle, A.J., (1996). Fundamental Principles of Bacteriology. (7thEdition). Tata McGraw-Hill Publishing Company Ltd, New Delhi.
17. Pelezar Jr., M.J.Chan E.C.S., and Kreig N.R. (1993).Microbiology. McGraw Hill, Inc., New York.
18. Stainer R.Y., Ingraham J.L., Wheelis M.L., and J: Jainter P.R. (1986), General Microbiology. MacMillan Education. Ltd., London).
19. Ec Eldowney S, Hardsan D.J., Waite D.J., and Waite S. (1993). Pollution: Ecology and Biotreatment – Longman Scientific Technical.
20. Clescri, L.S., Greenberg, A.E. and Eaton, A.D. (1998). StandardMethods for the Examination of Water and Waste Water (20thEdition). American Public Health Association.

21. Gerhardt, P., Murray, R.G., Wood, W.A. and Kreig, N.R. (1994). *Methods for General and Molecular Bacteriology*. ASM, Publications, Washington D.C.
22. Patricia Cuning (1995). *Official Methods of Analysis*, Vol. I and II, (16th Edition), Arlington, Virginia, USA, AOAL.
23. Richard G. Burus and Howard Slater (1982) *Experimental Microbial Ecology*, Blackwell Scientific Publishers.
24. Tuffery (1996). *Laboratory Animal – An Introduction*. (2nd Edition). John Wiley and Sons, New York.
25. Alexander, M. (1971). *Microbial Ecology*. John Wiley & Sons, Inc., New York.
26. Alexander, M. (1971). *Introduction to Soil Microbiology*. John Willey & Sons. Inc. New York.
27. Norris, J.R. and Pettipher, G.L. (1987). *Essays in Agricultural and Food Microbiology*. John Wiley and Sons, Singapore.
28. Harold J. Benson, (1994). *Microbiological Applications*. Wm.C. Brown Publishers, Melbourne, Australia.
29. James G. Cappucclono (1996). *Microbiology*. The Benjamin/Cummings Pub. Go., California.
30. Burges, A. and Raw, F. (1967). *Soil Biology*. Academic Press, London.
31. Vanghan, D. and Malcolm, R.E.(1985). *Soil Organic Matter and Biological Activity*. Martinus Nigh off W. Junk Publishers.
32. Marshal, K.D. (1985). *Advances in Microbial Ecology*. Plenum Press, New York.
33. Harry Buckman and Nyle C. Bardy. (1960). *The nature and Properties of Soil*. Eurasia Pub. House (Pvt.) Ltd., New Delhi.
34. Baker, W.C. and Herson, O.S. (1994). *Bioremediation*, McGraw Hill Inc., New York.
35. Ernest, W.C. (1982). *The Environment of the Deep Sea.*, Vol. II, J.G. Morin Rubey.
36. Eheinheimer, G. (1977). *Microbial Ecology of Brackish Water Environment: Ecological Studies*. Vol-25, Springer – Verlag Nerlin Heidellberg, New York.
37. Nybakken, W. (1982). *Marine Biology – An Ecological Approach*. Ames Harper and Row Publisher, New York.
38. Burns, R.C. and Slater. J.H. (1982). *Experimental Microbial Ecology*. Blackwell Scientific Pub, Oxford, London.
39. N.S. Subba Rao. 1999. *Soil microbiology*.
40. R.S. Mehrotra. 1980. *Plant pathology*. Sata Mc. Graw Hill. Pub Co. Ltd.

TAXONOMY OF ANGIOSPERMS AND ETHANOBOTANY

Unit: I

History and principles of classification: Detailed account of the system of classifications proposed by Bentham & Hooker, Engler&Prantl, Bessey and Cronquist (including merits and demerits). Phylogeny of Angiosperms: Origin, evolution and interrelationship.

Unit: II

Modern trends in classification: Taxometrics, Chemotaxonomy and Biosystematics: Botanical Survey of India (B.S.I) – Organization, function and contribution. National and International Herbaria and Botanical gardens. Taxonomic literature – taxonomic index, monographs and revisions. Bibliographies, catalogues and review serials, periodicals, glossaries, dictionaries, icons and floras.

Unit: III

Plant identification; Methods of Identification, Keys: types of keys; rules for construction of Keys; advantages and disadvantages. Nomenclature: International code of Botanical Nomenclature (ICBN). Typification, Priority, Publication, Author citation and retention, choice and rejection of names, current changes. Taxonomy in relation to Anatomy, floral anatomy, Palynology, Embryology and Cytology.

Unit: IV

A detailed account of the following families and their economic importances: Annonaceae, Capparidaceae, Caryophyllaceae, Portulacaceae, Rhamnaceae, Meliaceae, Sapindaceae, Aizoaceae, Rosaceae and Moringaceae.

Unit: V

Rubiaceae, Boraginaceae, Bignoniaceae, Scrophulariaceae, Chenopodiaceae. Casuarinaceae, Orchidaceae, Commelinaceae, Typhaceae, Alismataceae and Poaceae.

REFERENCES:

1. Davis, P.H. and Heywood, V.M. (1965) Principles of Angiosperm Taxonomy. Oliver and Boyd Edinburgh.
2. Gamble, J.S. and Fisher, L.E.F. (1967) The Flora of the presidency of Madras(Vol. I – III). Botanical Survey of India, Calcutta.

3. Heywood, V.H. (1967) Plant Taxonomy. Edward Arnold, Great Britain.
4. Hutchinson, J. (1973) The families of flowering plants. Oxford University Press, London.
5. Jeffery, C. An Introduction to Plant Taxonomy. J & A Churchill Ltd., London.
6. Lawrence, G.H.M. (1955) The Taxonomy of vascular plants (Vol. I-IV). Central Book Depot, Allahabad.
7. Rendle, A.B. The Classification of flowering plants (Vol. I-II).
8. Singh, V. and Jain, V.K. (1989) Taxonomy of Angiosperms. Rastogi Publication, Meerut.
9. Sivarajan, V.V. (1989) Introduction to principles of plant Taxonomy. Oxford and IBH, New Delhi.
10. Subramaniam, N.S. (1995) Modern Plant Taxonomy. Vikas Publishing House, New Delhi.

Practical -- III

TAXONOMY OF ANGIOSPERMS AND ETHANOBOTONY

1. Study of simple and complex tissues by using permanent slides.
2. Study of primary structure and sectioning of Dicot stem, Dicot root, Monocot Stem and Monocot root.
3. Anomalous secondary structures- Boerhaavia, Nyctanthes & Types of ovules. (Permanent slides).
4. Stages in Microsporogenesis and megasporogenesis. (DEMO).

MORPHOLOGY, TAXONOMY & ECONOMIC BOTANY

Unit: I

Morphology - Inflorescence - types- racemose, cymose, mixed and special types. Descriptive terminology of flower and floral parts. Fruit-classification. Details of simple ,fleshy,dry dehiscent and dry indehiscent, aggregate and multiple fruits.

Unit: II

Taxonomy:- Binomial nomenclature. Systems of classification-Bentham & Hooker and Engler&Prantl. Merits and Demerits of their systems. Herbarium Techniques.

Unit: III

A detailed study of the following families and their Economic Importance- Annonaceae,Capparidaceae, Tiliaceae, Rutaceae, Anacardiaceae, Leguminosae, (Papilionoideae (Fabaceae) Caesalpinoideae (Caesalpinaceae) &Mimosoideae (Mimosaceae) Cucurbitaceae, Apiaceae,

Unit: IV

Rubiaceae, &Asteraceae. Apocyanaceae, Asclepiadaceae, Solanceae, Convolvulaceae,Acanthaceae, Verbeneaceae, Amarantaceae, Euphorbiaceae, Orchidaceae, LiliaceaeandGramineae (Poaceae).

REFERENCES:

TAXONOMY

1. Porter, C.L. () : Taxonomy of flowering Plants Eurasia Publishing House, New Delhi.
2. Lawrence, G.H.M. (1953) : Taxonomy of Vascular Plants Oxford & IBH Publishers, New Delhi, Calcutta-823pp., 23
3. Mitra, J.N. (1964) : An Introduction to Systematic botany & Ecology The World Press (P) Ltd., Calcutta –694pp.
4. Jefferey, C. (1968) : An Introduction to Plant Taxonomy J.A. Churchill, London 142pp.,
5. Mathur, R.C. (1970) : Systematic Botany (Angiosperms) Agra Book Stores-Lucknow, Ajmer, Allahabad,Delhi, Kanpur, Meerut, Varanasi – 520pp.
6. Ramaswami, S.N., S.Lakshminarayana&V.Venkateswaralu (1976) : Taxonomy (Systematic Botany) for degree course Maruthi Book Depot, Guntur, Hyderabad 312pp.
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9. Sivarajan V.V. (1993) : Introduction to the Principles of Plant Taxonomy (2nd Edn.) (N.K.P. Robson(Ed.,) Oxford & IBH publishing Co., New Delhi-292pp.
10. Gurcharan Singh (1999) : Plant Systematics _Theory & Practice Oxford & IBH Publishing Co., (P)Ltd., New Delhi-370pp.
11. Pandey, B.P. (1997) : Taxonomy of Angiosperms S. Chand & Co., (P)Ltd., New Delhi-600pp.
12. Naik, V.N. (1996) : Taxonomy of Angiosperms(9th Edition) Tata McGraw Hill Publishing Co., (P)Ltd., Delhi-304pp.,
13. Vashista, P.C. (1997) : Taxonomy of Angiosperms,S. Chand & Co., New Delhi, Jullunder-884pp.,
14. Subramaniyan, N.S. (1999) : Laboratory Manual of Plant Taxonomy (2nd Edition) Tata McGraw Hill Publishing Co., New Delhi-685pp.
15. Jaques, H.E. (1999) : Plant Families-How to know them? Agro Botanical Publishers(India)-Bikaner-174pp.
16. Palaniyappan, S. (2000) :Angiospermgalinvagaiippadu (Taxonomy of Angiosperms) V.K. Publishing House, Chennai- 224pp.
17. Mathews, K.M. (1987-90) : Flora of TamilNadu& Carnatic (1-4vols.) Rapinat Herbarium, Trichy.24.
18. Lawrence., G.H.M. () : An Introduction to Plant Taxonomy The Central Book Depot, Allahabad.
19. Sharma. O.P. () : Plant Taxonomy Tata McGraw Hill Publishing Co., New Delhi- pp.

ECONOMIC BOTANY

1. Hill.,A.W. (1952) : Economic Botany McGraw Hill Book Co., New York. Pp.,
 2. Gupta, S.K.&Kaushik, M.P. (1973) : An Introduction to Economic BotanyK. Nath& Co., Meerut, India-147pp.
 3. Verma, V. (1974) : A Text Book of Economic Botany EmkayPublications, New Delhi 236pp.,
 4. GovindaPraksh&sharma, S.K. (1975) : Introductory Economic Botany Jai [REDACTED] 196pp.
 4. Sambamurthy, A.V.V.S. &Subrahmanyam, N.S. (1989) : A Text Book of Economic Botany Wiley Eastern Ltd., New Delhi, Bangalore, Bombay, Calcutta, Guwahati, Hyderabad, Lucknow, Madras, Pune-875pp.,
 5. Sen. S. (1992) : Economic botany New Central Book Agency, Calcutta-240pp.,
 6. Ashok Bendre& Ashok Kumar (1998-99) : Economic Botany Rastogi Publications, Meerut, India-274pp.,
- Pandey, B.P. (2000) : Economic Botany S. Chand & Co., New Delhi-534pp.,

Practical -- III

MORPHOLOGY, TAXONOMY AND ECONOMIC BOTANY

- 1.Description of plants in technical terms.
- 2.Dissection of vegetative parts of the biodiversity of your area.
- 3.Floral parts of plants belonging to the available families.
- 4.Ten herbarium sheets with common plants shall be submitted during the practical examination.

DEVELOPMENTAL BIOLOGY AND EVOLUTION

Unit: I

Gametogenesis – Spermatogenesis – Cells in seminiferous tubules, spermiogenesis, structure and types of sperm. Oogenesis – Growth of oocyte, vitellogenesis, organization of egg cytoplasm. Polarity and symmetry – Maturation of egg, egg envelopes. Types of chordate eggs. Fertilization – External and internal fertilization, sperm – egg interaction, physiological changes in the organization of egg cytoplasm, theories of fertilization.

Unit: II

Cleavage – Patterns of cleavage – radial, spiral and bilateral; Types – meroblastic, holoblastic and superficial Factors affecting cleavage; Chemodifferentiation. Blastulation – Types of blastula – Presumptive organ forming areas in frog and chick – Fate maps. Gastrulation – Gastrulation in frog and chick. Morphogenetic movements – Epiboly, emboly; Organogenesis – Development of eye Organizer concept; Embryonic induction.

Unit: III

Foetal membranes in chick; Placentation in mammals; Concept of test-tube baby; Nuclear transplantation; Factors involved in teratogenesis.

Unit: IV

Chemical origin of life; Lamarckism; Darwinism; de Vries theory of mutation; Modern synthetic theory of evolution.

Unit: V

Mimicry and animal colouration; Species concept; Isolating mechanisms; Evolution of horse; Evolution of man.

REFERENCES:

1. Arumugam.N. 1998. Developmental Biology, Saras Publications, Nagercoil.
2. Balinsky, B.I. 1981. An Introduction to Embryology. W.B. Saunders Company. Philadelphia.
3. Berry.A.K.2007. An Introduction to Embryology, Emkay Publications, New Delhi-51.
4. Verma, P.S. and Agarwal V.K. 2005. Chordate Embryology (Developmental biology) S.Chand& Company Ltd., New Delhi.
6. Arumugam, N. 1989. Organic Evolution –. Saras publication, Nagercoil.

7. Strickberger, M.W. 2000. Evolution. Jones and Bartlett Publishers.

Practical – III
DEVELOPMENTAL BIOLOGY & EVOLUTION

- 1.Observation of the structure of live spermatozoa of Calotes/Bull.
- 2.Observation of prepared micro slides to study
 - a. Egg, cleavage, blastula and yolk plug stage in frog.
 - b. Egg, 24 hrs, 36 hrs, 48 hrs, 72 hrs and 96 hrs developmental stages in chick.
3. Fossils: Trilobite, Nautilus. Mimicry: Leaf insects, Stick insects, Monarch and Viceroy butterfly.
- 4.Colouration: Chameleon and Lycodon.

HORTICULTURE

Unit: I

Horticulture :- Importance and scope of Horticulture, Classification of horticultural crops– fruits, vegetables crops, climate, soil, water, nutrition needs of horticultural crops,

Unit: II

Plant propagation methods, cutting, layering, grafting, budding, stock-seion relationship. Use of plant regulators in horticulture .

Unit: III

Garden designs, types of gardens – formal, informal and kitchen garden, units of garden, hedge, border, popiary arches and lawn maintenance. –

Unit: IV

Floriculture, cultivation of commercial flowers – rose and jasmines . Cultivation of important fruit trees – Mangoes and Banana.

Unit: V

Green house, Indoor gardening – Bonsai – flower arrangements – nursery management and maintenance

REFERENCES :

1. Bose, T.K. & Mukherjee, D. (1972) : Gardening in India Oxford & IBH Publishing Co., Kolkatta, Mumbai, New Delhi-385pp.,
 2. Sandhu, M.K. (1989) : plant PropagationWiley Eastern Ltd.,New Delhi, Bangalore, Bombay, Calcutta, Madras, Hyderabad, Pune-287pp.,
 3. LexLauries& Victor H. Rice- (1950) : Floriculture – fundamental and practices. McGraw Hill Publishers,
 4. N.Y. Kumar , N. (1997) : Introduction to Horticulture Rajalakshmi Publications, Nagercoil, India- (28 Chapters & approx. 300pages)
 5. Naik South Indian Fruits and their culture Vardhachary& Co., Madras. Edmond
 6. Musser & Andres : Fundamentals of Horticulture McGraw Hill Book Co.,
 7. Gardener : Basic Horticulture
 8. Mac Millan, N.Y. Randhawa : Ornamental Horticulture in India Today & Tomorrow Publishers, New Delhi Sundararajan,
- J.S. Muthuswamy, J. : A guide to horticulture Shanmugavelu, K.G. Balakrishnan, R. Thiruvankadam Printers, Coimbatore

Practical -- III
HORTICULTURE

1. Identification of common, ornamental plants
2. Types of pots and containers.
3. Manures and fertilizers,insecticides, fungicides and plant growth regulators.
4. Field visit to collect the data of Horticulture

5. Preparation of bonsai.

ECONOMIC ENTOMOLOGY

Unit: I

Classification of familiar pest and beneficial insects up to orders and their diagnostic characters.

Unit: II

Destructive insects: -Bionomics and life cycle of the common pests of paddy and coconut. Common pests of brinjal – pests of stored products.

Unit: III

Insect pest management: Insect pest control- Natural ; applied –mechanical, cultural control, chemical control and Biological control. Integrated pest management.

Unit: IV

House hold insect pests: Mosquito, cockroach, housefly, termites – damages caused and their control measures.

Unit: V

Beneficial insects:

1. Economic importance of honey bee, silkworm and lac insect.

Insects as pollinators, predators, parasites, weed killers, soil builders and scavengers.

REFERENCES:

1. Chapman R.F., 1993. The Insects. Structure and Functions. ELBS., London.
 2. Chandler A.C. and Read C.P. 1961. Introduction to Parasitology. John Wiley and Sons, New York.
 3. David, B.V., Muralirangan, N.C. and MeeraMuralirangan. 1992. Harmful and beneficial Insects. Popular Book Depot.
 4. David, B.V. and T. Kumaraswami. 1998. Elements of Economic Entomology. Popular Book Depot, Madras.
 5. David, B.V. 1992. Pest management and pesticides: Indian Scenario, Namrutha publications.
 6. Krishnan, N.T., 1993. Economic Entomology. JJ. Publications, Madurai.
 7. Mani, M.S., 1973. General Entomology. Oxford & IBH.
 8. Nayar, K.K., Ananthkrishnan T.N. and David, V.D. 1990. General and applied Entomology. Tata Mc Craw Hill, New Delhi.
 9. RamakrishnanAyyar, T.V., 1984. Handbook of Economic Entomology for South India. International Books and Periodicals Supply Service, New Delhi.
- Shukla.G.S& V.B.Upadhyay,1998. Economic Zoology,Rastogi Publication, Meerut

Practical - III

ECONOMIC ENTOMOLOGY

1. Collection and preservation of common insects
2. Insect metamorphosis
3. Life cycle of mulberry silkworm
4. Bioinsecticides

BIOINFORMATICS AND BIOSTATISTICS

Unit: I

Biology in the computer age: Computational Approaches to Biological questions. Basics of computers – servers, workstations, operating systems, Unix, Linux. World Wide Web. Search engines, finding scientific articles - Pubmed – public biological databases.

Unit: II

Genomics Sequence analysis – Sequencing genomes – sequence assembly – pairwise sequence comparison - genome on the web – annotating and analysing genome sequences. Genbank – sequence queries against biological databases – BLAST and FASTA – multifunctional tools for sequence analysis. Multiple sequence alignments, Phylogenetic alignment – profiles and motifs.

Unit: III

Proteomics Protein Data Bank, Swiss-prot - biochemical pathway databases - Predicting Protein structure and function from sequence – Determination of structure – feature detection – secondary structure prediction – predicting 3 D structure – protein modeling.

Unit: IV

Biostatistics I Introduction – Population and sample – Variables – Collection and presentation of data – Descriptive statistics - Measures of Central tendency – mean (arithmetic, harmonic & geometric) median and mode – Measures of dispersion – range, mean deviation, variance & standard deviation, Skewness and Kurtosis.

Unit: V

Biostatistics II Inferential statistics – Probability and distributions – Poisson, Binomial and Normal distribution – Chi-square test – Hypothesis test - Student's t-test – Correlation and Regression – ANOVA.

REFERENCES:

1. W.J. Ewens, Gregory Grant,(2005). Statistical Methods in Bioinformatics: An Introduction (Statistics for Biology & Health), Springer
 2. Bryan Bergeron,(2003).Bioinformatics Computing First Indian Edition, Prentice Hall,
 3. Cynthia Gibas & Per Jambeck (2001). Developing Bioinformatics Computer Skills: Shroff Publishers & Distributors Pvt. Ltd (O'Reilly), Mumbai
 4. HH Rashidi & LK Buehler (2002). Bioinformatics Basics: Applications in Biological Science and Medicine, CRC Press, London
 5. Des Higgins & Willie Taylor (2002). Bioinformatics: Sequence, structure and databanks, Oxford University Press
 6. Baxevanis AD & Ouellette BEF (2001) Bioinformatics: A practical guide to the analysis of genes and proteins, Wiley Interscience – New York
 7. Arora PN & Malhon PK (1996). Biostatistics Imalaya Publishing House, Mumbai.
 8. Sokal & Rohif (1973). Introduction to Biostatistics, Toppan Co. Japan.
 9. Stanton A & Clantz, Primer of Biostatistics — The McGraw Hill Inc., New York.
- Gurumani.N. (2006). Research Methodology for Biological Sciences. MJP Publishers, Chennai.

Practical - III

BIOINFORMATICS AND BIOSTATISTICS

1. Perform pairwise sequence alignment for a set of two analogous proteins – Demonstration.
2. Sequence similarity search using NCBI-BLAST tool – Demonstration
3. Construction of graph and bar diagram.
4. Calculation of mean, median, mode, standard deviation and standard error Chi-Square

PRACTICAL – III

1. Transformation in *E.coli*
2. Conjugation in *E.coli*-Uninterrupted and interrupted
3. Isolation of auxotrophic mutants.
4. Checking for antibiotic markers.
5. Collection and transport of clinical specimens-methodology and media.
6. Bacteriological analysis of the following specimens.
 - a) Urine
 - b) Faeces
 - c) Pus
 - d) Sputum
 - e) Ear
 - f) Throat
 - g) Wound swabs
7. WIDAL test: Qualitative and quantitative
8. Antibiotic sensitivity test – Kirby – Bauer disc diffusion method.
9. Estimation of dissolved oxygen.
10. Determination of BOD value.
11. Determination of COD.
12. Microbiological examination of water portability by (i) MPN method
(ii) Membrane filter method (Demo)
13. Microbial sampling of air
14. Population assay of extra cellular enzyme activities (amylase, cellulase and lipase).
15. Microbial flora from different types – population study.
16. Isolation of Rhizobium from root modules.
17. Study of Mycorrhizae in roots of crop plants
18. Isolation of *Azotobacter* and *Azospirillum* from soil samples.
19. Plant describes tobacco mosaic bacterial blight powdery mildew and citrus canker.
20. Isolation and testing of antagonistic microorganisms from soil.

Based on the open elective paper the relevant practicals listed following the open elective theory papers should be merged with the concerned semester practical at last

Laboratory Manuals recommended:

1. Cappuccino. J.G., and Sherman. N. (1996). Microbiology – Laboratory Manual. Benjamin Cummins. New York.
2. Kannan. N (1996), Laboratory Manual in General Microbiology. Palani Paramount Publication, Palani.
3. Gunasekaran. P. (1996). Laboratory Manual in Microbiology. New Age International Ltd., Publishers, New Delhi.
4. Sundararaj, T. (2005), Microbiology – Laboratory Manual. (1stEdition), Pubin Sundararaj. A, Chennai.
5. Jayaraman, J. (1985) Laboratory Manual in Biochemistry. Willey Eastern Ltd., New Delhi.
6. Plummer D.T. (1998). An introduction to Practical Biochemistry Tata McGraw Hill, NewDelhi.
7. Palanivelu.P. Analytical. Biochemistry and Separation Techniques.
8. Benson (2002). Microbiological Applications – Laboratory Manual in General Microbiology. International Edition, McGraw Hill Higher Education.
9. Collins, C.R. and Lyne. P.M. (1976). Microbiological Methods (4th edition), Butterworths, London.
10. Dubey. R.C. and Maheswari O.K. (2002). Practical Microbiology. S.Chand and Co Ltd., New Delhi.
11. Baron E.L and Finegold S.M. (1995). Diagnostic Microbiology, Stack well Scientific Press.
12. Davis. L, M.D. and Battey J.F. (1986) Basic methods in Molecular Biology. Elsevier, Amsterdam.

Food Microbiology

Unit: I

Concept and scope of food microbiology – Food composition – Types and microorganisms in food materials. (Bacteria Mold, and Yeasts) – Factors influencing microbial growth in food. Extrinsic and intrinsic factors. (Nutrient content, p^H , buffering capacity, redox potential, relative humidity.

Unit: II

Contamination and its sources. Spoilage of foods and its classification Principles of food preservation. (Temperature – Dehydration – Osmotic pressure – Chemicals – Radiation). Contamination, spoilage and preservation of Cereals – Vegetables – fruits – Seafood's – Meat – Milk and poultry products. Canning and food additives.

Unit: III

Food borne infections and intoxications of Brucella, Bacillus, Clostridium, E. coli, Listeria, Salmonella, Shigella, Staphylococcus, Vibrio, Yersinia – Fungal toxins.

Unit: IV

Fermented foods – Bread – Cheese – Vinegar – Dairy products – Oriental fermented foods – fermented beverages (Beer and Wine) – Genetically engineered foods.

Unit: V

Food produced by microbes – microbial cells as food – SCP (Spirulina and Chlorella) – Mushroom cultivation – Laboratory testing procedures – Food controlling agencies and its regulations. Plant sanitation – Employees health and preventive measures.

Textbooks recommended:

1. Adams, M.R. and Moses, M.O. (1995). Food Microbiology. The Royal Society of Chemistry, Cambridge.
2. Frazier, W.C. and Westhoff, D.C. (2008). Food Microbiology. (4th edition). Tata McGraw Hill Publishing Co Ltd., New Delhi.
3. Jay, J.M. (1987), Modern Food Microbiology. CBS Publishers and Distributors, New Delhi.
4. Atlas, R.M (1989). Microbiology. Fundamentals and Applications Macmillan Publishing Company.
5. Banwart, G.J. (1989). Basic Food Microbiology. Chapman & Hall New York.

6. Board, RC. (1983). A Modern Introduction to Food Microbiology. Blackwell Scientific Publications, Oxford.
7. Robinson, RK (1990). Dairy Microbiology. Elsevier Applied Science, London.
8. Hobbs. B.C. and Roberts, D. (1993). Food Poisoning and Food Hygiene. Edward Arnold (A Division of Hodder and Stoughton), London.
9. Robinson, R.K. (1990). Dairy Microbiology. Elsevier Applied Sciences London.
10. Vijaya Ramesh, K., (2007). Food Microbiology. MJP Publishers, Chennai.
11. Kharatyan, S.G. (1978). Microbes as Food for Humans. Annual for Microbial, 32: 301-30).
12. Sudhir Andrews (2008). Food and Beverage Management. McGraw Hill Companies, New Delhi.
13. Neelam Khetarpaul (2006). Food Microbiology. Daya Publishing House, New Delhi.
14. S.N.Tripathy (2006). Food Biotechnology. Dominant Publishers and Distributors, New Delhi.

References:

1. Bernard D. Davis, Renato Dulbecco, Herman N. Eisen and Harold, S. Ginsberg. (1990). Microbiology. (4th Edition). J.B. Lippincott Company, New York.
2. Prescott LM., Harley J.P., and Klein D.A., (2008). Microbiology. (7th Edition). McGraw Hill, New York.
3. Larry Mc Kane and Judy Kandel (1996). Microbiology Essentials and Applications. (2nd Edition). McGraw – Hill Inc, New York.
4. Madigan M., T., (Martinko. J.M., and Parker J., Brock TO. (1997) Biology of Microorganisms. (8th Edition). Prentice Hall International Inc, London.
5. Nester, E.W., Roberts, C.V., and Nester, M.T. (1995). Microbiology – A Human Perspective. IWOA, U.S.A.
6. Salle, A.J., (1996). Fundamental Principles of Bacteriology, (7th Edition). Tata McGraw-Hili Publishing Company Ltd, New Delhi.
7. Pelezar Jr., M.J.Chan E.C.S., and Kreig N.R (1993). Microbiology, McGraw Hill, Inc., New York.
8. Stainer RY., Ingraham J.L., Wheelis M.L., and Painter: P.R.(1986). General Microbiology, MacMillan Education Ltd., London.
9. Tortora, Funke, Case Addison (2001), Microbiology – An Introduction. (7th Edition). Wesley Longman Inc.
10. Dubey R.C., and Maheswari, S. (2003) A Text Book of Microbiology. S. Chand, & Co, New Delhi.
11. John L. Ingraham and Catherine A Ingrahani. (2000) Introduction to Microbiology. Books/Cole Thomas Learning, New York.
12. Talaro. P., and Talaro. A (1999). Foundations in Microbiology. WCP McGraw – Hill, New York.

Fermentation and Industrial Microbiology

Unit: I

Concepts and historical development of Industrial microbiology. Industrial microbes & products. Growth and product formation in industrial process. Types of processing: upstream and down stream. Screening: primary and secondary. Preservation of microbes and its types. Strain improvement. Culture collection. Media: significance, types & components. Raw materials in industrial fermentation: molasses, cellulose, corn steep liquor, soybean meal and malt extract. Role of agroindustrial wastes in media preparation. Industrial sterilization of equipment, production media and air.

Unit: II

Microbial growth kinetics. Stages of fermentation. Scale up of fermentation. Inoculum development for large scale. Inoculum development and production media. Fermenter and bioreactor: Principle and factors involved in fermentor design. Basic components and functions of fermenter.

Unit: III

Fermenter types: size: Lab, pilot scale & industrial fermentor, process: submerged and solid state. Nature: Continuous reactor, plug flow reactor, air-driven column reactors, bubble column, air lift bioreactor, fluidized bed reactor, tower fermentor and shake flask fermentor. Process control in fermentation: aeration, oxygen delivery system, foam control, temperature, pH, agitation and operation. Role of computer in process control.

Unit: IV

Down stream processing: Stages: Removal of insoluble, product isolation, purification and polishing and technologies involved. An overview on the process, types limitations and applications of filtration, flocculation, sedimentation, gravity settling, cell disruption, centrifugation, solvent extraction, precipitation, membrane processing, whole broth processing, chromatography, drying, crystallization and lyophilization.

Unit: V

Industrial products produced by microorganisms. Enzymes (Amylase, protease), organic acids (Vinegar). Solvent (Ethyl alcohol, butane diol). Amino acids (L- Lysine, L – Glutamic acid). Production of antibiotics (Penicillin, streptomycin). Vitamins (B₁₂). Beverages (Beer, wine). Yeast (Baker's, brewer and food and feed yeast production). Immobilization: principle, types, significance and applications.

Textbooks recommended:

1. Reed.G. (Editor), Industrial Microbiology, CBS Publishers, AVI Publishing Company.
2. Demain. A.L., and Soloman N.A. (1986). Manual of Industrial Microbiology and Biotechnology.
3. Hershnergy. CL. Queener. S.W. and Hegeman. Q Genetics and Biotechnology of Industrial Microorganisms. ASM Press. USA.
4. Stanbury, P.F.A., Whitaker and Hal. S.J. (1995). Principles of Fermentation Technology. (2nd Edition). Pergamon, U.K.
5. Casida. L.E (1989). Industrial Microbiology. Willey Eastern Limited, New Delhi.
6. Waif Crueger and Anneliese Crueger. (2002). Biotechnology – A Text Book of Industrial Microbiology. Sinauer Associates Inc. Laderland, USA.
7. Ward, O.P.(1998). Fermentation Biotechnology – Principles, Process and Products.
8. Jackson. A.T. Process Engineering in Biotechnology.
9. Nielson & Villadson. Bioreaction Engineering Principles.
10. Prescott & Dunn. (1992). Industrial Microbiology. (4th Edition).
11. Glazer & Nikaido (1998). Microbial Biotechnology.
12. Bernard D. Davis, Renato Dulbecco, Herman N. Eisen and Harold, S.
13. Ginsberg. (1990). Microbiology. (4th Edition). J.B.Lippincott company, New York.
14. Kalaiselvan, P.T., ArulpandLI. (2007). Bioprocess Technology. MJPPublishers, Chennai.
15. Hershnergy C.L., Queenersw and Hegemanq (1998), Genetics and Biotechnology of Industrial Microorganism. ASM Press. USA.
16. Pepler, H.J., and Perlman, D. (1979). Microbial Technology. Vol and Academic Press.

References:

1. Prescott L.M., Harley J.P., and Klein D.A (2008). Microbiology. (7th Edition). McGraw Hill, New York.
2. Larry Mc Kane and Judy Kandel (1996). Microbiology – Essentials and Applications. (2nd Edition). McGraw-Hill Inc, New York.
3. Madigan M., Martinko J.M., and Parker J., Brock T.D. (1997). Biology of Microorganisms. (8th Edition). Prentice Hall International Inc, London.
4. Nester, E.W., Roberts, C.V., and Nester, M.T.(1995). Microbiology -A Human Perspective. IWOA, U.S.A.
5. Salle, A.J. (1996). Fundamental Principles of Bacteriology. (7th Edition). Tata McGraw Hill Publishing Company Ltd, New Delhi.
6. Peleazar Jr; M.J.Chan E.C.S., and Kreig N.R. (1993). Microbiology McGraw Hill, Inc, New York.
7. Stainer R.Y., Ingraham J.L., Wheelis M.L, And Painter P.R(1986). General Microbiology, MacMillan Education Ltd., London.
8. Starr, M.P., Stolp, H., Truper, H.C., Balows, A., and Schegel, H.C. (1991). The Prokaryotes. A Hand Book of Habitats, Isolation and Identification of Bacteria, Springer Verlag.
9. Tortora, Funke, Case Addison (2001), Microbiology – An Introduction (7th Edition). Wesley Longman Inc.
10. Dubey R.C., and Miaheswari, S. (2003) A Text Book of Microbiology. S.Chand & Co, NewDelhi.
11. John L. Ingraham and Catherine A Ingrahani (2000) Introduction to Microbiology. Books/ Cole. Thomas Learning, New York.
12. Talaro K.P., and Talaro. A. (1999).Foundations in Microbiology. WCP McGraw – Hill New York.

BIOTECHNOLOGY

Unit: I

Definition, Concepts –History of biotechnology - Basic tools and techniques of rDNA Technology – Restriction enzymes Types I, II, and III - Modifying enzymes – Ligases – Isoshizomers – Isolation of fragments with cohesive end and blunt end – Homopolymer tailing – Isolation of nucleic acids, DNA sequencing – Maxam Gilbert – Dideoxy and automation methods – PCR-Southern and northern blotting – DNA finger printing – RFLP – RAPD- AFLP and QTLS.

Unit: II

Cloning vectors – Derived bacterial plasmid vectors – Properties – Isolation – Special Vectors – Phage vectors – Cosmids, phasmids, M_{13} and Mu phage – Yeast cloning vectors.

Unit: III

Screening procedures – Cloning strategies – DNA hybridization, immunological assay, protein activity –Isolation of cloned genes – Gene libraries – Identification of recombinants, structural and functional analysis of recombinants in bacteria and yeast.

Unit: IV

Application of recombinant DNA technology – Genetic engineering of plants – Plant transformation, Ti plasmids, derived vectors. Physical methods of gene transfer in plants – Reporter genes in transformed cells. Developing plant strains by genetic engineering – insecticide – herbicide –viral resistant plants - Stress and senescence tolerance - flower pigmentation - plant products.

Unit: V

Transgenic animals – Transgenic mice, methodology – Direct gene transfer – Retroviral vector transfer – EEE method and application - Development and use of transgenic cattle sheep, goat, pigs, birds and fish.

Textbooks recommended:

1. Brown, T.A (1999). Gene Cloning. (3rd Edition). Chapman and Hall publications, USA.
2. Burrell, M.M. (1993). Enzymes of Molecular Biology. Humana Press.
3. Chirikian, J.G. (1995), Biotechnology – Theory and Techniques. Vol. II, Jones and Bartlett Publishers.
4. Gerhardt, P., Murray, R.G., Wood W.A., and Kreig, N.R. (1994) Methods for General and Molecular Bacteriology. ASM Press, Washington D.C.
5. Glick, B.R. and Pasternak, J.J. (1998) – Molecular Biotechnology Principles and applications of Recombinant DNA. ASM Press, Washington D.C.
6. Cafferty, M.C., J., Hoogenboom, H.R. and Chiswell, D.J. (1996) Antibody Engineering – A Practical Approach, Oxford University Press.
7. Lewin, B.(2000). Genes VII. Oxford University Press, Oxford.
8. Murray Moo Young (1992). Plant Biotechnology. Pergamon Press.
9. Radledge, C., and Kristiansen, B. (2001). Basic Biotechnology. (2nd Edition) Cambridge University Press.
10. BIOTOC-Biotechnology (1993). Techniques for Engineering Genes, Published on behalf of Open University and University of Greenwich, Butter Heinman Ltd, Oxford.
11. Water G. and Headon D. (1994). Protein Biotechnology. John Wiley and Sons, New York.
12. Mariappan C.A., text book of molecular biotechnology. Pooja Publishers India.
13. Winnacker, E.L. (1987). From Genes to Clones: Introduction to Gene Technology. VCH Publication Federal Republic of Germany.
14. Antony, J.F., Griffiths, Gilbert, W.M., Lewontin, R.C. and Miller, J.H. (2002). Modern Genetic Analysis., Integrating Genes and Genomes. (2nd Edition). WH Freeman and Company, New York.
15. Blackburn, G.M. and Gait, M.J. (1996). Nucleic Acids in Chemistry and Biology. Oxford University Press.
16. Alberts, B., Brag, D., Lewis, J., Raff, M., Roberts, K., and Watson. J.D(1994). Molecular Biology of Cell. Garland Publ Inc.
17. Malacinski G.M., and Freifelder. D. (1998). Essentials of Molecular Biology. Jones and Bartlett Publ.
18. Maloy, S.R., Cronan, J.R. Freifelder, D. (1994). Microbial Genetics. Jones and Bartlett Publ.
19. Macinski, G.M. and Freifelder, D. (1998). Essentials of Molecular Biology. (3rd Edition). John Bartlett Publishers.
20. Sir John Kendrew (1994). The Encyclopedia of Molecular Biology. Blackwell Science Ltd.
21. Swaminathan. M.S. and Jana.S. (1992). Bio-diversity. Implications for Global Food Security. Mac Millan, Madras.
22. Rigby. P.W.J. (Editor). 1987. Genetic Engineering. 6th Academic Press, London.
23. Wiseman. A. (1983). Principles of Biotechnology. Chapman and Hall, New York.
24. Gupta. P.K. (1996). Elements Biotechnology. Chapman and Hall, New York.

25. Michael Boylan and Kevin. E.Brown (2003). Genetic Engineering Pearson Education (Singapore) Pvt Ltd., New Delhi.
26. Mukbesh Pasupuleti (2006). Molecular Biotechnology. S. Chand and Co Ltd., New Delhi.
27. Dubey. R.C. (1996). A Text Book of Biotechnology. S. Chand and Co Ltd., New Delhi.
28. Das.H.K. (2005). Text Book of Biotechnology. Wiley Dreamtech India (P) Ltd., New Delhi.
29. Cheremisinoff. P.N. (1985). Biotechnology – Applications and Research Technomic Pub.Co.Inc. Lancaster, USA.
30. Sathyanarayana...U.(2005). Biotechnology. Books and Allied (P)., Kolkatta.
31. Peppler, H.J., and Rer/man, D. (1979). Microbial Technology. Vol I and II, Academic Press.

References:

1. Desmona.S.T., Nicholl. (19.94). An Introduction to Genetic Engineering Cambridge Press.
2. Anand Solomon. K.(2008). Molecular Modeling' and Drug. Design. MJP Publishers, Chennai.
3. Susa R. Barnum (2002) Monoclonal Antibodies. MJP Publishers, Chennai.
4. Nisonoff.A(1985). Introduction to Molecular (1) munology. (2nd Edition Sunderland, Mass.)
5. Zaltin. M., Day. P and Hollaender A. (1983). Biotechnology in Plant Sciences Relevant to Agriculture, Academic Press. London.

PROJECT

To plan and design an appropriate viable project and statistically apply the data wherever possible and process it accordingly after the correct retrieval of relevant literature and fixation of an organized plan of work. The research project should be supported with figures, tabulations, plates and photographs along with necessitated bibliography.

The project work may be done either in the department itself or in collaboration with any other organization of advanced learning.

The final project report should be submitted to the head of the course department 15 days before the university prescribed date. The project report shall contain atleast 35 pages excluding bibliography and appendices. Each student will have to submit **THREE** copies of his / her project for evaluation in the fourth semester itself.

PRACTICAL – IV

1. Standard plate count of milk
2. Microbiological examination of milk
 - i) Methylene blue reduction test
 - ii) Rezaurin test
 - iii) Phosphatase test
3. Microbiology of fermentation milk products
 - i) Curd
4. Microbiological analysis of foods
 - i) Soft drinks
 - ii) Meat and fish
 - iii) Fruits and Vegetables
 - iv) Salted and dried foods
 - v) Bread
5. Production of enzymes by batch fermentation (Protease and Amylase).
6. Purification of extracellular enzymes
 - I. Enzyme precipitation – Ammonium sulphate and Acetone.
 - II. Dialysis of crude enzymes.
 - III. Ion-exchange chromatography - Demonstration.
7. Enzymes and Whole cell Immobilization.
8. Fermentative production of ethyl alcohol by yeast.
9. Wine production - Demonstration.
10. Solid-state fermentation - Demonstration.
11. Production – extraction and purification of any antibiotic (Demo).
12. Preparation of fermented product-yogurt from milk
13. Restriction enzyme Digestion with Labeled DNA – Lambda phage DNA (Demo).
14. Blue white selection with IPTG- Demonstration.
15. Cloning by desired vector – pBR322 - Demonstration.

PROJECT

To plan and design an appropriate viable project and statistically apply the data wherever possible and process it accordingly after the correct retrieval of relevant literature and fixation of an organized plan of work. The research project should be supported with figures, tabulations, plates and photographs along with necessitated bibliography.

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Laboratory Manuals recommended:

1. Cappuccino.J.C:7 and Sherman. N. (196). Microbiology – Laboratory Manual. Benjamin Cummins, New York
2. Kannan. N. (1996). Laboratory manual in General Microbiology. Palani Paramount Publication, Palani.
3. Gunasekharan. P. (1996). Laboratory manual in Microbiology, New Age International Ltd., Publishers, New Delhi.
4. Sundararaj, T. (2005). Microbiology – laboratory manual. (1st edition). Pubinj. Sundararaj, T, Chennai
5. Jayaraman, J. (1985). Laboratory manual in Biochemistry. Wiley Eastern Ltd, New Delhi.
6. Plummer, D.T. (1998). An Introduction to practical Biochemistry. Tata McGraw Hill, New Delhi.
7. Palanivelu P. (2001). Analytical Biochemistry and Separation techniques – A Laboratory Manual.
8. Benson (2002). Microbiological applications – Laboratory Manual in General Microbiology. International edition. Mc Graw Hill Higher education.
9. Collins, C.R. and Lyne P.M. (1976). Microbiological methods (4th edition). Butterwoths, London.
10. Dubey, R.C. and Maheshwari, O.K., (2002). Practical Microbiology. S. Chand and Co Ltd., New Delhi.
11. Baron, E.J. and Finegold, S.M. (1995). Diagnostic Microbiology. Blackwell Scientific Press.
12. Davis, L., Dipner, M.O and Battey, J.F. (1986). Basic methods in Molecular Biology. Elseiver, Amsterdam

MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI
PG - COURSES – AFFILIATED COLLEGES
Course Structure for M.Sc Networking and Information Technology
(Choice Based Credit System)
(with effect from the academic year 2016- 2017 onwards)
(44th SCAA meeting held on 30.05.2016)

Sem	Sub 'Pr. No.	Subject status	Subject Title	Hrs/ week	Cre - dits	Marks				
						Maximum			Passing minimum	
						Int.	Ext	Tot.	Ext.	Tot
III	13	Core – 7	Web Designing	5	5	25	75	100	38	50
	14	Core – 8	Operating System	5	5	25	75	100	38	50
	15	Core – 9	Net Security and Cryptography	5	5	25	75	100	38	50
	16	Core – 10	Research Methodology	5	5	25	75	100	38	50
	17	Elective -- III (Choose any one)	a. Data Warehouse and Mining b.Mobile Computing	5	4	25	75	100	38	50
	18	Practical- V	Web Designing and Network Lab	5	9	50	50	100	25	50
IV	19	Main Project	Main Project	--	15	50	50	100	25	50

Web Designing

Unit-1 Web programming Basics and Installations

Web Publishing: A Quick look-HTML 4.0: the web Publishing Foundation- HTML basics- Putting your Server to work-Server side programming- XML Basics.

Unit-II Installation and Configuration

Getting up and running: Installation Quick Start Guide- Installing and configuring MySQL- Installing and configuring Apache-Installing and configuring PHP.

Unit-III PHP Language Structure

The Building blocks of PHP- Flow Control Functions in PHP- Working with Functions- Working with Arrays- Working with Objects- Working with Strings, Dates and Time- Working with Forms- Working with Cookies and User Sessions- Working with Files and Directories Working with Images

Unit-IV PHP and MySQL Integration

Understanding the Database Design- Process Learning Basic SQL Commands Using Transactions and Stored Procedures in MySQL- Interacting with MySQL Using PHP.

Unit-V Basic Projects

Managing a Simple Mailing List- Creating an Online Address Book- Creating a Simple Discussion Forum- Creating an Online Storefront and shopping Cart Mechanism- Creating a Simple Calendar- Restricting Access to Your Applications- Logging and Monitoring Web Server Activity- Application Localization- Working with XML- Connecting to Web Services Apache Performance Tuning and Virtual Hosting- Setting Up a Secure Web Server- Optimizing and Tuning MySQL.

REFERENCE BOOKS

1. Sam Teach Yourself PHP, MySQL and Apache All in One, 5th Edition, Julie Meloni
2. Dynamic Web Publishing, Second Edition, Shelley Powers, Techmedia
3. Steve Suehring, Tim Converse and Joyce Park, "PHP 6 and MySQL 6 Bible", Wiley India reprint, 2009.
4. Robert Sheldon, Geoff Moes, "Beginning MySQL", Wrox, 2005.
5. BEN FORTA, "MySQL Crash course "SAMS, 2006.

Operating Systems

Unit-I

Operating System Overview: Objectives and Functions - Processes: Process Description and Control – UNIX SVR4 Process Management – Threads and Multithreading – Symmetric Multiprocessing - Windows Thread Management - Solaris Thread and SMP Management - Linux Thread Management - Android Thread Management

Unit-II

Mutual Exclusion and Synchronization: Semaphores – Monitors - Message Passing – producer-consumer problem – readers writers problem - Principles of Deadlock – Deadlock prevention – Avoidance – Detection

Unit-III

Virtual Memory Management: Paging – segmentation - Operating System Software policies - Windows Memory Management - Android Memory Management - Uniprocessor Scheduling: Types of Scheduling - Scheduling Algorithms - Real-Time Scheduling

Unit-IV

I/O Management and Disk Scheduling: I/O Buffering - Disk Scheduling – RAID - File Management : File Organization and Access - Secondary Storage Management – File Allocation Methods – Free Space Management - Windows File System - Android File Management - Embedded Operating Systems: Characteristics – Ecos

Unit-V

Operating System Security: Basic concepts - Intruders and Malicious Software - viruses - Distributed Processing, Client/Server, and Clusters: Client/Server Computing - Distributed Message Passing - Remote Procedure Calls – Clusters - Windows Cluster Server – Sun Cluster

REFERENCE BOOKS

1. Operating Systems-Internals and Design Principles, Williams Stallings, Pearson, 8th Edition, 2014.
2. Modern Operating Systems, Andrew S. Tanenbaum, Pearson,, 4th Edition, 2014.
3. Operating System Concepts, Abraham Silberschatz , Peter B. Galvin, Greg Gagne, John Wiley & Sons, 8th Edition, 2008.

Network Security and Cryptography

Unit-I

Introduction, Attacks, services and Mechanisms - security attacks - security services - A model for internetwork security - Internet standards and RFCS. Classical Encryption Techniques: symmetric cipher Model - Substitution Techniques -Transportation Techniques Rotor Mechanism – Steganography.

Unit-II

Block ciphers and the data encryption standard simplified DES - Block Cipher Principles -The Data encryption standard -The strength of DES - Differentials and Linear Cryptanalysis -Block Cipher design principles -Block Cipher modes of operations. Public Key Cryptography and RSA: Principles of Public - Key Cryptosystems The RSA Algorithm.

Unit-III

Key Management; Other Public-Key Cryptosystems: Key Managements- Diffie Hellman Key Exchange-Elliptic curve Arithmetic - Elliptic curve Cryptography Message Authentication & Hash functions: Authentication Requirements-Authentication functions-message Authentication Codes- Hash functions- Security of Hash functions & MACS. Digital Signatures -Authentication Protocols -Digital Signature Standard.

Unit-IV

Authentication applications: Kerberos X 509 Authentication service. Electronic Mail security: Pretty good Privacy - S/MIME 445 IP Security: IP Security overview - IP Security Architecture - Authentication Header - Encapsulation security Payload.

Unit-V

Web Security: Web Security Considerations - Secure Sockets Layer and Transport Layer Security - Secure Electronic Transactions System Security: Intruders - Intrusion detection - Password Management. Firewalls: Firewalls Design Principles - Trusted Systems

REFERENCE BOOKS

1. William Stallings,"CRYPTOGRAPHY AND NETWORK SECURITY - PRINCIPLES AND PRACTICES", Pearson Education, Third Edition, 2003.
2. William Stallings,"NETWORK SECURITY ESSENTIAL - APPLICATIONS AND STANDARDS", Pearson Education, 2003.
3. Atul kahate,"CRYPTOGRAPHY AND NETWORK SECURITY", TMCH, 2003
4. Charlie Kanfman, Radio Pearlman, Mike Speciner, "NETWORK SECURITY", Second Edition, Pearson Education Asia.

Research Methodology

Unit-I

Research Methodology: An Introduction - Meaning of Research - Objectives of Research - Types of Research, Motivation in Research - Research Approaches, Significance of Research - Research Methods Verses Methodology - Research and Scientific Method - Research Process - Criteria of Good Research - Problems Encountered by Researchers in India. Defining the Research Problem: What is a Research Problem? - Selecting the Problem - Technique Involved in Defining a Problem - Research Design: Meaning - Need for research Design - Features of a Good Design - Important Concept relating to Research Design - Different Research Designs - Basic Principles of Experimental Designs.

Unit-II

Sampling Design: Census and sample survey - Implications of a sample design - Steps in sample design - Criteria of selecting a sampling procedure - Characteristics of a good sample design - Different types of sample designs - How to select a random sample? - Random sample from an infinite Universe - Complex random sampling designs - Measurement and scaling Techniques: measurement in research - Measurement scales - Sources of error in measurement - Tests of sound measurements - Technique of developing measurement tools - Scaling, meaning of scaling - Scale classification bases - Important scaling techniques - Scale construction techniques.

Unit-III

Methods of Data Collection - Collection of Primary Data - Observation Method - Interview method - Collection of Data through Questionnaires - Collection of Data through Schedules - Some Other Methods of Data Collection - Collection of Secondary Data - Selection of Appropriate Method for Data Collection - Interpretation and Report writing - Meaning of Interpretation, Why Interpretation? - Technique of Interpretation, Precaution in Interpretation - Significance of Report Writing - Different Steps in Writing Report - Layout of the Research Report - Types of Reports - Mechanics of Writing a Research Report - Precautions for Writing Research Reports.

Unit-IV

Chi-Square Test for large samples – Definition of Chi-Square – Limitations of Chi-Square test - Chi-Square test as a test of goodness of fit and as a test of independence – Yate’s correction and its applications – Analysis of variance(ANOVA) : Concept – One way ANOVA – ANOVA in test in Latin Square Design

Unit - V

Algorithmic Research – Introduction - Algorithmic Research Problems - Types of Solution procedure/Algorithm - Steps of Development of Algorithm - Steps of algorithmic Research - Design of Experiments and Comparison of Algorithms - Meta Heuristics for Combinatorial Problems - The Computer: Its Role in research - The computer and Computer Technology - The Computer System - Important Characteristics - Computer Applications- Computers and Researchers.

REFERENCE BOOKS

1. C.R.Kothari, “Research Methodology Methods and Techniques”, (Second Revised Edition), New Age International Publishers, New Delhi, 2010.
2. R.Panneerselvam, “Research Methodology”, PHI Learning Private Limited, New Delhi, 2009.

Data Warehousing and Mining

Unit-I

Introduction: Data Mining tasks – Data Mining versus Knowledge Discovery in Data bases – Relational databases – Data warehouses – Transactional databases – Object oriented databases – Spatial databases – Temporal databases – Text and Multimedia databases – Heterogeneous databases - Mining Issues – Metrics – Social implications of Data mining

Unit-II

Data Preprocessing: Why Preprocess the data – Data cleaning – Data Integration – Data Transformation – Data Reduction – Data Discretization.

Unit-III

Data Mining Techniques: Association Rule Mining – The Apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint Based Association Mining

Unit-IV

Classification and Prediction: Issues regarding Classification and Prediction – Decision Tree induction – Bayesian Classification – Back Propagation – Classification Methods – Prediction – Classifiers accuracy

Unit-V

Clustering Techniques: cluster Analysis – Clustering Methods – Hierarchical Methods – Density Based Methods – Outlier Analysis – Introduction to Advanced Topics: Web Mining , Spatial Mining and Temporal Mining

REFERENCE BOOKS

1. J. Han and M. Kamber , 2001, Data Mining: Concepts and Techniques, Morgan Kaufmann, .New Delhi-27
2. M. H.Dunham, 2003, Data Mining : Introductory and Advanced Topics , Pearson Education, Delhi.
3. Paulraj Ponnaiah, 2001, Data Warehousing Fundamentals, Wiley Publishers.
4. S.N. Sivananda and S. Sumathi, 2006, Data Mining, Thomsan Learning, Chennai.

Mobile Computing

Unit-I

Introduction: Wireless transmission, Frequencies for radio transmission, Signals, Antennas, Signal Propagation, Multiplexing, Modulations, Spread spectrum, MAC, SDMA, FDMA, TDMA, CDMA, Cellular Wireless Network.

Unit-II

Telecommunication systems: GSM, GPRS, DECT, UMTS, IMT-2000, Satellite Networks, Basics, Parameters and Configurations, Capacity Allocation, FAMA and DAMA, Broadcast Systems, DAB, DVB.

Unit-III

Wireless LAN: IEEE 802.11, Architecture, Services, MAC, Physical layer, IEEE802.11a-802.11b standards, HIPERLAN, BlueTooth.

Unit-IV

Mobile IP, Dynamic Host Configuration Protocol, Routing, DSDV, DSR, Alternative Metrics

Unit-V

Traditional TCP, Classical TCP improvements, WAP, WAP 2.0, WML Basics, WML Cards.

REFERENCE BOOKS

1. Jochen Schiller, "Mobile Communications", 2/e, PHI/Pearson Education, 2003.
2. William Stallings, "Wireless Communication and Networks", PHI/Pearson Education, 2002
3. Kaveh Pahlaven, Prasanth Krishnamoorthy, "Principles of Wireless Networks", PHI/Pearson Education, 2003.
4. Hazysztof Wesolowshi, "Mobile Communication Systems", John Wiley and Sons Ltd, 2002.

Web Designing and Network Lab

Web Designing – Practical Lists

1. Write a HTML code to display information about your college use
 - 1)Bold Tag
 - 2)Centre Tag
 - 3)Heading & Font tags. Add background colour and picture
2. Create a HTML document to display a list of four flowers and link each one to another document displaying brief description of the flower. Add pictures wherever possible.
3. Create a table to display the marks obtained in the exam.
4. Write an HTML code to display a list of 5 cars in a frame .Link each one to a brief description in second frame The left frame should display the list and the right frame should display the paragraph about the frame.
5. Page hit counter
6. Input/output operations
7. Reading/writing files and Directories
8. Calendar application using PHP
9. MySQL Connectivity and Database manipulations
10. Session maintenance in PHP.

Network- Practical Lists

1. Write a socket program for Echo commands
2. Write a socket program for Ping commands
3. Write a socket program for Talk commands
4. Create a socket (TCP) between two computers and enable file transfer between them.
5. Write a socket for HTTP for Web page upload & download
6. Create a Socket (UDP)
7. Write a program for TCP Module implementation
8. Perform a case study for the shortest path routing algorithms to select the network and to select the network path.

MSU / 2016-17 / PG –Colleges / M.Sc.(Networking and Information Technology) / Semester - IV/ Ppr.no.19/ Project

Main Project & Viva Voce

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.Sc Physics

(Choice Based Credit System)

(with effect from the academic year 2016- 2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem	Sub 'Pr. No.	Subject status	Subject Title	Hrs/ week	Cre - dits	Marks				
						Maximum			Passing minimum	
						Int.	Ext	Tot.	Ext.	Tot
III	12	Core – 7	Quantum Mechanics I	6	5	25	75	100	38	50
	13	Core – 8	Electromagnetic Theory	6	5	25	75	100	38	50
	14	Core - 9	Statistical Mechanics	6	5	25	75	100	38	50
	15	Core - 10	Research Methodology	6	5	25	75	100	38	50
	16	Practical – III	General Physics Experiments II	6	--	--	--	--	--	--
IV	17	Core – 11	Quantum Mechanics II	6	4	25	75	100	38	50
	18	Core - 12	Spectroscopy	6	4	25	75	100	38	50
	19	Core - 13	Nuclear and Particle Physics	6	4	25	75	100	38	50
	20	Project		6	4	50	50	100	25	50
	21	Practical – III	General Physics Experiments II	--	4	50	50	100	25	50
	22	Practical - IV	Microprocessor and C++ Programming	6	6	50	50	100	25	50

Quantum Mechanics I

UNIT I

Fundamentals of wave mechanics

Heisenberg uncertainty principle- The classical uncertainty relation- Illustration of uncertainty relation- Phase and Group velocities- Wave packets and uncertainty principle- Gaussian wave packet- Stern Gerlach experiment

Construction of Schrodinger equation- Solution of time dependent equation- Parseval's theorem -physical interpretation of $\psi^* \psi$ - conditions for allowed wave functions- Box normalization- Conservation of probability- Expectation values- Basic postulates- Time evolution of stationary states- conditions for allowed transitions- orthogonality of two states- phase of the wave function.

UNIT II

Operators and matrix mechanics

Introduction- linear operators- commuting and noncommuting operators- Self adjoint and Hermitian operators- discrete and continuous eigen values- meaning of eigenvalues and eigenfunctions- parity operator- matrix representation of operator and wave function- Schrodinger wave equation and other quantities in matrix form- matrix theory of harmonic oscillator- Dirac's BRA and KET vectors- Linear vector space and Hilbert space- Projection and Displacement operators-Momentum eigen function- Transformation between momentum and coordinate representation-operators in momentum representation- momentum function of some systems

Unit III

Equation of motion and density matrix

Introduction- Schrodinger picture- Heisenberg picture- Interaction picture- Poisson bracket and commutator bracket- evaluation of commutator bracket- Density operator- Density matrix for a single system- Density matrix for an ensemble -Time evolution of Density operator- spin $\frac{1}{2}$ system

UNIT IV

Exactly soluble systems

Bound states: Simple Harmonic oscillator- Schrodinger equation- eigen values, energy eigen function- Three dimensional Square Well potential- Solution in interior region, exterior region and matching—Rigid rotator- wave equation- eigen values and eigenfunction for the rotator- Hydrogen atom-solution of radial equation- energy levels- stationary state wave function- discussion of bound states. Scattering states: Potential barrier- Tunnel effect-finite square well potential-potential step- locally periodic potential- reflectionless potentials.

Unit V

Theory of angular momentum

Introduction: Scalar wave function under rotation- orbital angular momentum- Eigen pairs of L^2 and L_z - properties of components of L and L^2 - eigen spectra through commutation relations- matrix representation of L^2 , L_z and L_{\pm} - spin states of an electron- spin orbit coupling- rotational transformation- rotational properties of operator- addition of angular momenta- Clebsch- Gordan coefficients

Books for Study:

1. Quantum Mechanics - L. Schiff- Third Edition (Tata Mc-Graw Hill, New Delhi)

Books for Reference:

1. Quantum Mechanics I: Fundamentals- S. Rajasekar and R. Velusamy (CRC Press, Taylor and Francis group- Boca Raton, London)
2. A Text Book of Quantum Mechanics- P. M. Mathews and K. Venkatesan (Tata McGraw Hill, New Delhi, 1987)
3. Quantum Mechanics - S. Devanarayanan (Sci. Tech. Publications Pvt Ltd, Chennai, 2005)
4. Quantum Mechanics- G. Aruldhas (Prentice Hall of India, New Delhi, 2003)

Electromagnetic Theory

Unit I

Electrostatics

Coloumb's law – Gauss law – Poisson's equation and Laplace's equation – work done to move a point charge – energy of a point charge and continuous charge distribution – methods of images – electric field in dielectric materials – induced dipoles and polarizability – connection between polarizability and susceptibility – susceptibility, permittivity and dielectric constant of linear dielectric.

Unit II

Magnetostatics

Lorentz force law – Biot-savart's law and Ampere's law – magnetic vector potential multipole- Expansion of the vector potential – Effects of a magnetic field on atomic orbits – magnetic energy – Dia, Para, Ferro magnetism – magnetic susceptibility and permeability in linear and non linear media.

Unit III

Electrodynamics

Electromagnetic induction – Faraday's law – Maxwell's equation differential and integral form – Boundary conditions on field vectors D, E, B and H – Scalar and vector potentials – Gauge transformations – Lorentz and coloumb gauge – pointing vector and pointing theorem – Maxwell's stress tensor – Conservation of momentum.

Unit IV

Electromagnetic waves

The wave equation for E and B – Monochromatic plane waves – energy and momentum in EM waves in linear media – Reflection and transmission at normal and Oblique incidence – EM waves in conductors wave guides – TE waves in rectangular wave guides – the coaxial transmission line.

Unit V

Electromagnetic radiation

Retarded potential – Lenard – Wiechart potential – Electric dipole radiation – magnetic dipole radiation – power radiated by a point charge – amour formula – Abraham Lorentz formula for the radiation reaction – physical origin of radiation reaction.

Book for Study:

1. Introduction to Electrodynamics, David J Griffiths. Prentice Hall of India. II Edition, 1989.

Books for Reference:

1. Classical electrodynamics, J.D.Jackson., Wiley Eastern Publication. Second edition, 1975
2. Foundation of electromagnetic theory, J.R. Reitz, E.J Milford and R.W Christy
3. Electromagnetic fields and waves, P.Lorrain and D.Corson. CBS Publishers and distributors, 1986
4. Electrodynamics, B.P Laud, New Age International Pvt. Ltd. 1987

Statistical Mechanics

Unit I

Basic concepts

Phase space-phase-space diagram of an oscillator-Volume in phase space-Ensembles-Microcanonical ensemble-Canonical ensemble-Grand canonical ensemble-Density of distribution in phase space-Liouville's theorem-Postulate of equal a priori probability-statistical, mechanical and thermal equilibria-connection between statistical and thermodynamical quantities.

Unit II

M-B Distribution law

Microstates and macro states-Stirling's approximation-Thermodynamic probability-General statistical distribution law-Classical Maxwell-Boltzmann distribution law-Evaluation of constants in the Maxwell Boltzmann distribution law-Maxwell's law of distribution of velocities-principle of equipartition of energy-Boltzmann entropy relation-Probability of magnetic moment distribution of independent atoms.

Unit III

Quantum statistics

Postulatory foundations of quantum mechanics-Transition from classical statistical mechanics to quantum statistical mechanics-Indistinguishability and quantum statistics-Exchange symmetry of wave functions-Bose-Einstein Statistics-Fermi-Dirac statistics-Maxwell-Boltzmann statistics-Results of three statistics-Thermodynamic interpretation of the parameters α and β -Black body radiation and the Planck radiation law

Unit IV

Applications of quantum statistics:

Specific heat of solids-Dulong and Petit law-Einstein theory of specific heat of solids-Debye theory of specific heat of solids-Criticism of Debye's theory-Ideal Bose Einstein Gas-Energy and pressure of the Gas-Gas degeneracy-Bose-Einstein Condensation-Thermal properties of Bose Einstein Gas-Ideal Fermi Dirac gas- Energy and pressure of the Gas-Thermodynamics functions of degenerate Fermi-Dirac gas-Electron Gas

Unit V

Phase transitions

Phase transition-Phase transitions of first and second kind-critical exponent-Yang and Lee theory-Phase transitions of second kind: the Ising model-Bragg-Williams approximation-One dimensional Ising model

Book for Study:

1. Elementary statistical Mechanics Dr.S.L.Gupta & Dr. V.Kumar,Pragati Prakasan,Meerut 22nd Edition 2008

Books for Reference:

1. Fundamentals of statistical mechanics B B Laud New age international Publishers 2005
2. An Introductory course of Statistical Mechanics Palash B.Pal Narosa First reprint 2009
3. Statistical Mechanics by Kerson Huang
4. Statistical Mechanics by Sears and Salinger.

Research Methodology

Unit I

Fundamentals of research

Definitions and characteristics of research - Research process and steps in it - Areas of research –Research methods vs Methodology -Characteristics of scientific method - Motivation and objectives - Bias and Prejudice in research - Types of research – Descriptive vs. Analytical, Applied vs.Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical.

Unit II

Formulation of research

Defining and formulating the research problem -Selecting the problem - Necessity of defining the problem - Importance of literature review in defining a problem – Literature review – Primary, secondary and tertiary sources – reviews, treatise, monographs- patents – web as a source – searching the web - Critical literature review – Identifying gap areas from literature review.

Unit III

Research design

Basic Principles- Need of research design – Features of good design – Important concepts relating to research design – Observation and Facts, Laws and Theories, Prediction and explanation, Induction, Deduction, Development of Models. Developing a research plan - Exploration, Description, Diagnosis, Experimentation. Determining experimental and sample designs.

Unit IV

Execution and reporting research

Observation and Collection of theoretical & experimental data - Methods of data collection – Comparison of Data - Generalization and Interpretation. Structure and components of scientific reports -Types of report – Technical reports and thesis –Different steps in the preparation – Layout, structure and Language of thesis – Illustrations, figures and tables- Quotation and footnotes - Bibliography, referencing.

Unit V

Research ethics and publication of results

Environmental impacts - Ethical issues -Plagiarism – Research Journals – Impact Factor – Citation Index – Reporting to Journals - Commercialization – Copy right – royalty - Intellectual property rights and patent law – Trade Related aspects of Intellectual Property Rights – Reproduction of published material - Reproducibility and accountability.

Books For Study:

1. C.K., Research Methodology 2nd Edn, – Methods and Techniques, New Age International, New Delhi (2004).
2. Garg, B.L., Kothari Karadia, R., Agarwal, F. and Agarwal, An introduction to Research Methodology, RBSA Publishers. U.K. (2002).
3. Sinha, S.C. and Dhiman, A.K., Research Methodology 2 volumes, EssEss Publications, New Delhi (2002).
4. Trochim, W.M.K., Research Methods: the concise knowledge base, Atomic Dog Publishing, OH US (2005).
5. Wadehra, B.L. Law relating to patents, trade marks, copyright designs and geographical indications, Universal Law Publishing. New Delhi (2000).

Books For Reference:

1. S. Rajasekar, P. Philominathan and V. Chinnathambi, Research Methodology
2. Anthony, M., Graziano, A.M. and Raulin, M.L., Research Methods: A Process of Inquiry, Allyn and Bacon, Boston, US (2009).
3. Day, R.A., How to Write and Publish a Scientific Paper, Cambridge University Press. U.K (1992).
4. Leedy, P.D. and Ormrod, J.E., Practical Research: Planning and Design 10th Ed., Pearson New International Edn, USA. (2014)

General Physics Experiments II
Any 10 Experiments

1. Guoy's Balance
Determination of Magnetic Susceptibility (Volume and Mass) of the given sample.
(use a specimen in the form of a long rod or tube filled with powder or liquid)
2. Elliptical Fringes
Determination of Young's modulus, Bulk modulus, Rigidity modulus, Poisson's ratio and compressibility of the given material by forming Elliptical fringes.
3. Temperature coefficient and Band Gap
Determination of Temperature coefficient and band gap of a given Semiconductor Thermistor using Carey-Foster Bridge.
4. Hall Effect
 - a. Definition of Hall effect and its application
Determination of
 - b. Hall voltage
 - c. Hall coefficient
 - d. Carrier density
 - e. Mobility of charge carriers
 - f. Resistivity
5. Four Probe
 - a) Four Probe principle
 - b) Measurement of Resistivity and Energy band gap of a given semiconductor material
 - c) Measurement of Resistivity of a large sample using Four Probe mapping.
6. Equipotential lines
 - a) Formation of equipotential lines for a) parallel plates b) circular plates c) plates of irregular shape.
 - b) Determination of Electric field between the equipotential lines.
 - c) Mapping of Electric field vector between the plates.
7. Ultrasonic Diffraction
Formation of acoustic grating in a given liquid using a crystal to determine the velocity of ultrasonic wave in the liquid and compressibility of the liquid.
Repeat for another liquid and hence find the ratio of compressibility and velocity.
8. Temperature coefficient of a forward biased diode
Measure the resistance of a forward biased diode at three different temperatures and hence find the temperature coefficient. Also plot variation of I with respect to T.

9. Phototransistor Characteristics
Characteristic Study of Phototransistor using
a) light sources of different wave length b) light sources of different intensities
Plots for a) Spectral response b) Sensitivity c) Linearity
10. LCR circuit
a) Determination of dielectric constant of a liquid using LCR circuit
b) Determination of dielectric constant of a given crystal using LCR meter.
11. Hysteresis
Formation and tracing of magnetic hysteresis loop for the given specimen to determine
a) Coercivity
b) Retentivity and
c) Energy loss per unit volume per cycle of the specimen
12. Two Probe
Determination of resistivity of the given samples
13. Calibration of Hall Probe into Gauss meter
a) Calibration of Hall probe into Gauss meter using a Search coil and
b) Determination of calibration curve for a two axis Hall probe in radial mode

Quantum Mechanics II

Unit I

Approximation Methods I

Time Independent Perturbation Theory: Introduction- Theory for non degenerate case- Application to non degenerate levels- Theory of degenerate levels- First order Stark effect in Hydrogen atom

Time Dependent Perturbation Theory: Introduction- Transition probability- constant perturbation-Harmonic perturbation- adiabatic perturbation- sudden approximation- application to semi classical theory of radiation- calculation of Einstein coefficients

Unit II

Approximation methods II

WKB method: Introduction- principle of WKB method- applications of WKB method- WKB quantization with perturbation- asymptotic method

Variational approach: Introduction- calculation of ground state energy- trial eigen functions for excited states- application to hydrogen molecule- Hydrogen molecule ion

Unit III

Scattering theory

Kinematics of scattering process- wave mechanical picture- Green's functions - Born approximation and its validity- Born series- screened columbic potential-scattering from Born approximation.-Partial wave analysis: asymptotic behavior- phase shift- scattering amplitude in terms of phase shifts-differential and total cross sections- optical theorem- low scattering-resonant scattering- nonresonant scattering- scattering length and effective range- Ramsauer Townsend effect- scattering by square well potential

Unit IV

Identical particles

Identical particles- Introduction- symmetric and anti-symmetric wave functions- The exclusion principle- spin eigen function of two electrons- exchange interaction- excited states of Helium atom- collision between identical particles

Symmetry in Quantum Mechanics: Conservation laws and degeneracy associated with symmetries - Continuous symmetries- Space and time translations- Rotations- Group theory applied to symmetries - Wigner-Eckart theorem - Discrete symmetries - Parity and Time reversal

Unit V

Relativistic quantum theory

Schroedinger relativistic equation- Klein-Gordon equation- charge and current densities- interaction with electro magnetic field- Hydrogen like atom-nonrelativistic limit.

Dirac's relativistic Hamiltonian- probability density- Dirac matrices- plane wave solution- eigen spectrum- spin of Dirac's particle- significance of negative energy states- concept of anti particles- electron in a magnetic field- spin magnetic moment- spin orbit energy

Books for Study:

1. Quantum Mechanics - L. Schiff Third Edition (Tata McGraw Hill, New Delhi)

Books for Reference:

1. Quantum Mechanics I: The Fundamentals- S. Rajasekar and R. Velusamy- (CRC Press, Taylor and Francis group- Boca Raton, London)
2. A Text Book of Quantum Mechanics- P. M. Mathews and K. Venkatesan, (Tata McGraw Hill, New Delhi, 1987)
3. Quantum Mechanics - S. Devanarayanan, (SciTech Publications Pvt Ltd, Chennai,
4. Quantum Mechanics - V. Devanathan, (Narosa Publishing House, New Delhi, 2006)

Spectroscopy

Unit I

Microwave Spectroscopy

Classification of molecules based on moment of inertia – rotational spectra of rigid and non-rigid diatomic molecules – Isotopic effect – intensities of spectral lines and information from them – linear polyatomic molecule - symmetric top molecule – chemical analysis – microwave spectrometer.

Unit II

Infrared Spectroscopy

Vibrating diatomic and polyatomic molecules – Simple harmonic oscillator – anharmonicity – Hydrogen bonding – Fermi resonance – rotation vibration spectra of polyatomic molecule – information from IR spectra – IR spectrometer – FTIR.

Unit III

Raman Spectroscopy

Theory of Raman scattering – rotation vibration Raman spectra – mutual exclusion principle – Raman spectrometer – polarization of Raman scattered light – structure determination using IR and Raman spectrum – phase transition – resonance Raman scattering.

Unit IV

Resonance Spectroscopy

Magnetic properties of nuclei – resonance condition – relaxation time – Chemical shift – application to molecular structure – Bloch equation – NMR instrumentation – NMR imaging – ESR theory and hyperfine structure ESR spectra of hydrogen atom and anisotropic systems – triplet state analysis – crystal defects and biological studies – ESR spectrometer.

Unit V

Surface spectroscopy

Electron Energy Loss Spectroscopy EELS – Reflection – absorption IR spectroscopy RAIRS – Surface Enhanced Raman Scattering SERS – Inelastic Helium Scattering – X-Ray Photoelectron Spectroscopy XEPS – Ultraviolet PES – Auger Electron Spectroscopy AES – Extended X-ray absorption fine Structure EXAFS.

Book for Study:

1. N.Banwell and E.M.Mc Cash, Fundamentals of Molecular Spectroscopy, Tata McGraw Hill.
2. G.Aruldas, Molecular Structure and Spectroscopy, Prentice Hall India.

Book for Reference:

1. B.P.Strughan and S.Walker, Spectroscopy, John Wiley.
2. Peter J.Larkin, IR and Raman Spectroscopy Principle and Spectral Interpretation, Elsevier.
3. Gordon M. Barrow, Introduction to Molecular Spectroscopy, McGraw-Hill .

Nuclear and Particle Physics

Unit I

Nuclear Forces

Ground and excited states of deuteron – magnetic dipole and electric quadrupole moments of deuteron – n-p scattering at low energies – scattering length – phase shift analysis – shape independent effective range theory of np scattering – pp scattering at low energies – exchange forces –meson theory of nuclear force.

Unit II

Nuclear Decays

Gamow's theory of alpha decay – line and Continuous spectrum of β decay - Fermi theory of beta decay – Fermi and Gamow-Teller selection rules – parity violation – detection and properties of neutrino – Gamma decay – multipole transitions in nuclei – selection rules – internal conversion – nuclear isomerism.

Unit III

Nuclear Models

Liquid drop model – Weizsackers mass formula – mass parabola – nuclear stability – Bohr Wheeler theory of nuclear fission -magic numbers -evidence for magic numbers – shell model – spin orbit coupling – angular momenta and parities of nuclear ground states – magnetic moments -schmidt line - collective model.

Unit IV

Nuclear reactions and Nuclear reactors

Types of nuclear reactions – Q-equation – solution of the equation – compound nuclear theory – reciprocity theorem – nuclear cross section – resonance scattering– Breit - Wigner dispersion formula – nuclear chain reaction – four factor formula – critical size of a reactor – reactor buckling – classification of nuclear reactor based on fuel and moderator.

Unit V

Elementary Particles

Classification of elementary particles - fundamental interactions conservations laws – CPT theorem - SU(3) multiplet – meson octet – baryon octet and baryon decouplet – Gellmann-Okubo mass formula - Quark theory.

Books For Study:

1. Nuclear Physics, D. C. Tayal, Himalaya Publications.
2. Elements of Nuclear Physics, M. C. Pandia and R. P. S. Yadav Kedarnath.

Books For Reference:

1. Concepts of Nuclear Physics, Bernard L Cohen, Tata Mc Graw-Hill
2. Nuclear Physics an Introduction, S. B. Patel, Wiley Eastern Ltd.
3. Nuclear Physics, R. R. Roy and B. P. Nigam, New Age International Ltd.

Project

General Physics Experiments II

Any 10 Experiments

14. Guoy's Balance
Determination of Magnetic Susceptibility (Volume and Mass) of the given sample.
(use a specimen in the form of a long rod or tube filled with powder or liquid)
15. Elliptical Fringes
Determination of Young's modulus, Bulk modulus, Rigidity modulus, Poisson's ratio and compressibility of the given material by forming Elliptical fringes.
16. Temperature coefficient and Band Gap
Determination of Temperature coefficient and band gap of a given Semiconductor Thermistor using Carey-Foster Bridge.
17. Hall Effect
 - a. Definition of Hall effect and its application
Determination of
 - b. Hall voltage
 - c. Hall coefficient
 - d. Carrier density
 - e. Mobility of charge carriers
 - f. Resistivity
18. Four Probe
 - d) Four Probe principle
 - e) Measurement of Resistivity and Energy band gap of a given semiconductor material
 - f) Measurement of Resistivity of a large sample using Four Probe mapping.
19. Equipotential lines
 - d) Formation of equipotential lines for a) parallel plates b) circular plates c) plates of irregular shape.
 - e) Determination of Electric field between the equipotential lines.
 - f) Mapping of Electric field vector between the plates.
20. Ultrasonic Diffraction
Formation of acoustic grating in a given liquid using a crystal to determine the velocity of ultrasonic wave in the liquid and compressibility of the liquid.
Repeat for another liquid and hence find the ratio of compressibility and velocity.
21. Temperature coefficient of a forward biased diode
Measure the resistance of a forward biased diode at three different temperatures and hence find the temperature coefficient. Also plot variation of I with respect to T.
22. Phototransistor Characteristics
Characteristic Study of Phototransistor using
 - a) light sources of different wave length
 - b) light sources of different intensitiesPlots for a) Spectral response b) Sensitivity c) Linearity

23. LCR circuit

- c) Determination of dielectric constant of a liquid using LCR circuit
- d) Determination of dielectric constant of a given crystal using LCR meter.

24. Hysteresis

Formation and tracing of magnetic hysteresis loop for the given specimen to determine

- d) Coercivity
- e) Retentivity and
- f) Energy loss per unit volume per cycle of the specimen

25. Two Probe

Determination of resistivity of the given samples

26. Calibration of Hall Probe into Gauss meter

- b) Calibration of Hall probe into Gauss meter using a Search coil and
- c) Determination of calibration curve for a two axis Hall probe in radial mode

Microprocessor and C++ Programming

(Any 12 programs with a minimum of 5 from each PART. For University examination, questions will be either from Microprocessor or from C++ Programming)

PART A: Microprocessor Programming
(All programs must have Algorithm and Flow chart)

1. Arithmetic Operations
 - a) Addition of two 8 bit and two 16 bit numbers
 - b) Subtraction of two 8 bit and 16 bit numbers
 - c) Multiplication of two 8 bit numbers – 16 bit result.
 - d) Division of 16 bit by an 8 bit number.
2. Data Manipulation
 - a) Arrange the given data items in Ascending or Descending order
 - b) Finding the Minimum and Maximum value in the given data set.
 - c) Search of a given character/number in the given data set.
3. System Call and Counters
 - a) Display a character/number on the 7 segment display of the Kit using Monitor Call.
 - b) Calculation of Time delay for a given interval.
 - c) Up-Counter to count from 00 upto 'nn' with 1 sec time interval.
 - d) Down counter to count from 'nn' to 00 with specified counting interval.
4. Block Move and Series Generation
 - a) Moving a block of data from memory xxxx to yyyy.
 - b) Fibonacci series generation
 - c) Tribonacci series generation
5. System Call and Rolling character
 - a) Calculation of time delay for a given interval.
 - b) Display a Character on the 7 segment display of the Kit using Monitor Call.
 - c) Roll a given character from Left to Right / Right to Left on the 7 segment displays with the specified time interval.
6. ADC and DAC conversion
 - a) Interfacing ADC with 8085 – ADC chip Block diagram – 8085- ADC interfacing diagram
 - b) Conversion of analog input to digital – Resolution – Graph between input and output.
 - c) Interfacing DAC with 8085 –DAC chip Block diagram – 8085 DAC interfacing diagram.
 - d) Conversion of digital input to analog – Resolution – Graph between input and output.
7. DAC interfacing and Wave form generation.
Interfacing DAC with 8085 – DDC Chip Block diagram – 8085- DAC-8085 interfacing diagram and Wave Form generation using DAC
 - a) Square wave with the specified period
 - b) Rectangular wave with the specified period
 - c) Ramp Wave with the specified period
 - d) Triangular Wave

PART B: C++ programming
(All programs must have Algorithm and Flow chart)

1. Curve Fitting – Fitting a straight line.
 - a) Principle of least Square and fitting a straight line.
 - b) Principle of linear interpolation
 - c) C++ program to fit a straight line using the data obtained from Cauchy's Constant Experiment and Interpolation using the fitted equation
2. Solution of simultaneous equations - Gauss Elimination method.
 - a) Procedure to solve Simultaneous equations using Gauss Elimination Method
 - b) Solving unknown branch currents in Wheatstone's bridge using GE method manually.
 - c) C++ program to solve the equations.
3. Numerical Differentiation.
 - a) Derivation of Exponential law of Radio active decay.
 - b) RK 4th order method of solving a given 1st order differential equation.
 - c) Analytical computation of the mass of the given radioactive sample after a specified period (Given: activity or half life period).
 - d) C++ program using RK method to solve radio active problem – Compare output with the analytical result.
4. Area under the Curve
 - a) Numerical integration – derivation of Simpson's rule
 - b) C++ programs for Simpson 1/3rd rule, Simpson 3/8 rule and Montecarlo integration.
 - c) Comparison of the program output with direct integration.
5. Eigen Value and Eigen Vector.
 - a) Explanation of Eigen Values and Eigen Vectors.
 - b) Calculation of Eigen Values and Eigen Vectors using analytical method.
 - c) C++ program to calculate Eigen values and Eigen vectors of a give matrix – Comparison with analytical result.
6. Matrix Multiplication
 - a) Multiplication of given matrices
 - b) Rotation matrix definition.
 - c) C++ program to rotate the given point about the origin using rotation matrix by the given angle.
7. Numerical Differentiation
 - a) Numerical differentiation – related to any physical problem
 - b) Derivation of Newton's law of cooling – equation
 - c) C++ program to verify the Newton's law of cooling from the given experimental data.
8. Solution of Algebraic and Transcendental equations.
 - a) Solution of the given equations using Newton Raphson Method – manual calculation.
 - b) C++ program to find the solution using N-R method and verification.

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.Sc. Zoology

(Choice Based Credit System)

(with effect from the academic year 2016- 2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem	Sub 'Pr. No.	Subject status	Subject Title	Hrs/ week	Cre - dits	Marks				
						Maximum			Passing minimum	
						Int.	Ext	Tot.	Ext.	Tot
III	12	Core – 7	Animal physiology	6	5	25	75	100	38	50
	13	Core – 8	Biostatistics and bioinformatics	6	5	25	75	100	38	50
	14	Core – 9	Aquaculture	6	5	25	75	100	38	50
	15	Elective	a. Research methodology (or) b. Bioinstrumentation	6	5	25	75	100	38	50
	16	Practical – III	Animal physiology, Biostatistics and bioinformatics, Aquaculture	6	--	-	-	-	-	-
IV	17	Core – 10	Biotechnology	6	4	25	75	100	38	50
	18	Core – 11	Genetics	6	4	25	75	100	38	50
	19	Core - 12	Immunology	6	4	25	75	100	38	50
	20	Practical – III	Core Practical – 7,8 & 9	--	4	50	50	100	25	50
	21	Practical -- IV	Core Practical – 10,11& 12	6	4	50	50	100	25	50
	22	Project		6	5	20	50	100	25	50

Animal Physiology

- Unit I : Nutrition and Digestion :** Importants of Carbohydrates, Protein, Lipids. Vitamins and Minerals with regard to human health. Balanced diet, Malnutrition and BMR. Human digestive tract and functions. Role of enzymes in digestion of carbohydrates, proteins and lipids. Gastrointestinal hormones .Intestinal villi and absorption.
- Unit II : Blood and Circulation :** Structure of arteries and Veins. Blood Corpuscles. Haemopoiesis and formed elements. Plasma functions. Blood volume regulation. Blood groups Coagulation of blood. Structure and function of the human heart. Structure function of coronary arteries and vein. ECG, Cardiac cycle, Heart rate, Blood pressure. Neural and chemical regulation of heart.
- Unit III : Respiration and Excretion :** Respiration in air and water. Structure and function of human lung and the respiratory tract. Respiratory pigments. Gas transport between the lungs and tissues. Neural and chemical regulation of respiration .Human: Structure of the Kidney –Nephron Renal circulation –Urine formation. Renal disorders – Micturition and dialysis. Regulation of water and electrolytes. Hormonal control of osmo –iono regulation.
- Unit IV : Nervous System and Sense Organs :** Neuron –Structure and function Neuro transmitters –Synapse, Conduction of nerve impulses. Structure and function of brain and Spinal cord, EEG. Muscles –Classification – Ultra structure of skeletal muscle -Mechanism of muscular contraction –Neural control of muscles tone and function. Sense organ of vision, hearing and tactile responses.
- Unit V : Endocrinology and Reproduction :** Structure and function of Endocrine glands. Hormones and diseases. Basics mechanism of hormone action. Estrus and endometrial reproductive cycle's. Neuro endocrine regulation of reproduction.

Reference books :

1. General and Comparative Physiology – William S. Hoar.
2. Chordate Zoology – E. L. Jordan and P. S. Verma, S. Chand and Co., New Delhi.
3. Comparative Animal Physiology – C. D. Prosser and F. A. Brown.
4. Textbook of Animal Physiology – R. Nagabhushanam, M. S. Kodarkar and R. Sarojini.
5. Kunt Schmidt – Nicolsen Animal Physiology – Adaptation and Environment, Cambridge University Press.
6. Gayton, A. C. and Hall, J. E., A Textbook of Medical Physiology, 9th Edn., Harcourt Brace and Company Asia Pvt. Ltd., W. B. Saunders Company.

Biostatistics and Bioinformatics

- Unit 1 :** **Collection of Data :** Primary and Secondary data –Methods of collecting primary data –sources of secondary data. **Sampling and Sample Designs :** Essentials of sampling –Methods of sampling –Random sampling methods –Non random sampling methods –Merits and Limitations of sampling. Classification and tabulation of data –Diagrammatic and graphic presentation of data.
- Unit II :** **Measures of Central Tendency :** Mean- Arithmetic mean –Weighted arithmetic mean – Median – Mode. **Measures of Dispersion :** Quartile deviation – Mean deviation – Standard deviation – Lorenz curve. **Skewness Moments and Kurtosis :** Measure of skewness –Absolute measure of skewness -Relative measure of skewness -Karl Pearson’s coefficient of skewness- Bowley’s coefficient of skewness. Moments. Measures of kurtosis. **Correlation analysis :** Types of Correlation –Methods of studying correlation Karl Pearson’s coefficient of correlation –Regression Analysis –Regression line, Regression equations.
- Unit III :** **Probability and Expected Value :** Concepts of probability –Types of events - Theorems of probability - conditional probability –Bayes’ Theorem. **Theoretical Distribution :** Binomial distribution -Poisson distribution - Normal distribution. **Statistical Inference :** Test of hypothesis -procedure of testing hypothesis. **Estimation :** Test of significance for large sample - Test of significance for small samples –Student’s t- distribution.
- Unit IV :** Chi square test and a Goodness of fit –Yates correction F-Test and Analysis of Variance – one way classification and two way classification .Experimental design – Randomized block design –Latin squares – The Sign Test – A rank sum test (The Mann-Whitney U Test).

Unit V : Bioinformatics : Information Technology in Biology - Types of sequences used in bioinformatics – Application of Bioinformatics. **Biological Database** : Objectives – Properties of Database –database retrieval system –Symbols used in data base – Nomenclature of DNA sequences Nomenclature of protein sequences –NCBI .SWISS-PROT. **Data Base Similarity Search Tools** : BLAST –FASTA – Application of bioinformatics tools –Homology search tools –Protein functional analysis tools –Sequences analysis tools –Structural analysis tools - Molecular modeling and visualizing tools –Polygenetic analysis tools .

Text book

1. Gupta S.P. 2008 Statistical methods Sultan Chand & Co .New Delhi.
2. Khanum. A& I.A. Khan 2004 Fundamental of Biostatistics ,Ukazz Publication. Hyderabad.
3. Ramakrishnan P.1994 Biostatistics SARAS Publication TamilNadu
4. C.S.V.Murthy 2008 Bioinformatics Himalya Publishing House Pvt Ltd . New Delhi.
5. Sundararajan and Balaji 2007 Introduction to Bioinformatics Himalya Publishing House Pvt Ltd .Mumbai.

Reference book

1. Gerrold H Zar Fundamentals of Biostatistics 5th edition
2. Banergi,P.K. 2004Introduction to Biostatistics S Chand & company Ltd .NewDelhi.
3. Gurumani,N. 2004Introduction to Biostatistics .MJP Puplishers Chennai
4. Misra ,B.N.and Misra ,B.K.1998 Introductory Practical Biostatistics. Naya Prakash, Calcutta.
5. Pillai, RSN.and Bhavathi ,V.1989 Statistics S Chand & company Ltd .New Delhi
6. Schefler W.C.1980. Statistics for biological sciences Addison –Wesley Publishing Company, NewYork.
7. Sokal,R.R.and Rohif ,F.J. 1987 Introduction to Biostatistics .W.H.Freeman and Company New York.
8. Sundar Rao,P.S.S and Righard ,J.2002 An Introduction to Biostatistics .III edn Prentice Hall of India . NewDelhi.
9. N.J.Chikhale and V.S. Gomare 2007 Bioinformatics Theory and Practice Himalya Publishing House Pvt Ltd .Hyderabad.
10. Attwood T.K. Parry smith D.J. 2006
11. Introduction to biostatistics ,Dorling Kindersley (India) Pvt Ltd .South Asia.

Aquaculture

- Unit I** : Aquaculture: history, definition, scope & importance, fishery resources of India in general & Tamil Nadu in particular, a biotic and biotic factors of water necessary for fish life, ecological characteristics of lakes & rivers, general ecological characteristics of reservoirs of India.
- Unit II** : Fish culture: mono, poly, mixed & composite fish culture, fresh water and marine prawn culture and its prospects in India, culture of mussels, clams, oysters and pearl culture, sewage fed fish culture, paddy cum fish culture, frog culture, sea weed culture.
- Unit III** : Fish breeding in natural conditions, bundh breeding, hypophysation & stripping, transport of live fish and seed, different types of crafts and gears used for fish catching, plankton – its definition, culture & identification, common weeds of fish ponds& methods of their eradication, production of mono sex and sterile fishes, transgenic fishes, hybridization , polyploidy , role of bio technology in conservation of fishes.
- Unit IV** : Fresh water fish farm: selection of site, construction of fish farm and soil chemistry, designing layout and construction of different types of fish ponds, setting and management of fresh water aquarium, preservation and processing of fish, fish by products industry and their utility.
- Unit V** : Water pollution, its effects on fisheries and methods of its abatement, common fish diseases(bacterial, viral, fungal and nutritional deficiency diseases), biochemical composition and nutritional value of fish, fisheries economics and marketing, fisheries managements and extension.

Reference Books (latest editions):

1. T.V.R.Pillay & Dill: Advances in Aquaculture
2. Agarwal & S.C.Narendra: A Hand Book of Fish Farming
3. R.K.Rath: Fresh water Aquaculture
4. Schonder: Hypophysation in Indian Major Carp
5. C.B.Hall: Ponds & Fish Culture
6. C.B.L.Srivastava: Fishes of India
7. Jhingaran: Fish and Fisheries of India
8. S.S. Khanna: An Introduction to Fishes
9. B.S.Rath: Fresh Water Aquaculture
10. Gopalji Srivastava: Fishes of U.P.& Bihar
11. H.D.Kumar: Sustainability & Management of Aquaculture & Fisheries
12. A.J.K.Mainan: Identification of Fishes
13. R.Sanatam: A Manual of Fresh Water Aquaculture
14. S.K.Gupta: Fish and Fisheries

Research Methodology

- Unit I** : Research – Characteristics – types of research – steps in research – objectives of research – research report formatting and typing – laboratory safety – intellectual property rights.
- Unit II** : Microscopy – Principles – types of light microscopes – bright field – dark field – phase contrast – fluorescence – scanning – micrometry. Electron microscopes and types – atomic force and magnetic force microscopes.
- Unit III** : Centrifuge – types – principles and applications. pH meter – types – principles and applications. Colorimeter – principles and applications. Cryopreservation and its applications. Freezing and freeze drying microtomes. Cytotechniques.
- Unit IV** : Chromatography – paper – thin layer – column – gas liquid chromatography – affinity chromatography. Electrophoresis – paper – cellulose acetate – gel – immune electrophoresis. Blotting techniques – southern – northern – western. Radioactive counters – autoradiography – labeling studies.
- Unit V** : Spectrophotometer - Spectrofluorimeter – ESR –NMR Spectrophotometer – Flame Emission Photometry.

Reference Books

1. Gurumai, N., 2006. Research Methodology for Biological Sciences, MJR Publishers, Chennai.
2. Rana, S. V. S., Biotechniques, Rastogi Publications, Meerut.
3. Vijayalakshmi, G. and Sivapragasam, C., 2008. MJP Publishers, Chennai.
4. Wilson, K. and Walker, J., Practical Biochemistry, Cambridge Publications.
5. Palanivelu, R., Analytical Biochemistry and separation techniques. Tulsi Book Centre, Town Hall Road, Madurai.

Bioinstrumentation

- Unit I** : Microscopy, principles & applications – Light microscope and phase contrast microscope – Fluorescence microscope – Electron Microscope (SEM and TEM) – Confocal microscopy – Photo Micrography – Camera Lucida. General Principle and applications of Colorimeter – Spectrophotometer (UV / VIS) – Ultra Centrifuge – Flame Photometer – Beer and Lambert’s Law. Infra Red Spectroscopy, Atomic Absorption Spectroscopy, ESR and NMR, FT-IR and Raman Spectroscopy.
- Unit II** : Cryotechniques : Cryopreservation of cells, tissues, organs and organisms. Cryosurgery – Cryotomy – Freeze fracture and freeze drying. Separation techniques : Chromatography – Principle type and applications – Paper, Thin layer, Ion Exchange, Affinity and HPLC. Electrophoresis : Principles, types and applications, PAGE and Agarose Gel Electrophoresis.
- Unit III** : Radioisotope and main isotope techniques in biology : a. Sample preparation for radioactive counting – Autoradiography. Immunological techniques : Immunodiffusion (single & double) – Immuno electrophoresis. Techniques immune detection : Immunocyto / histochemistry – Immunoblotting, immunodetection, immunofluorescence. Surgical techniques : organ ablation (e.g. Ovariectomy, adrenalectomy) – Perfusion techniques – Stereotaxy – Indwelling catheters.
- Unit IV** : Histology techniques : Principles of tissue fixation – Microomy – Staining – Mounting – Histochemistry. Cell culture techniques : Design and functioning of tissue culture laboratory – culture media, essential components and preparation – Cell viability testing.

Unit V : Cytological techniques – Mitotic and meiotic chromosome preparations from insects – Chromosome banding techniques (G.C.Q. R. Banding) – Flowcytometry. Molecular cytological techniques – In site hybridization (radio labeled and non-radio labeled methods) – FISH – Restriction banding. Molecular biology techniques – Isolation of plasmid and chromosomal DNA – Staining and quantification of DNA.

References

1. Introduction to instrumental analysis – Robert Braun – Mc Graw Hill.
2. A biologist guide to Principles and Techniques of Practical Chemistry – K. Wilson and K. H. Goulding EIBS Edn.
3. Clark & Swizer, Experimental Biochemistry, Freeman, 2000.
4. Locquin and Langeron, Handbook of Microscopy, Butterworths, 1983.
5. Boyer, Modern Experimental Biochemistry, Benjamin, 1993.
6. Freifelder, Physical Biochemistry, Freeman, 1982.
7. Wilson and Walker, Practical Biochemistry, Cambridge, 2000.
8. Cooper, The Cell – A Molecular Approach, ASM, 1997.
9. John R. W. Masters, Animal Cell Culture – A Practical Approach, IRL Press.
10. Robert Braun. Introduction to instrumental analysis, Mc Graw Hill.
11. Nuclear Magnetic Resonance : Williams.
12. Biochemical Techniques theory and practice, White R.
13. Analytical Chemistry : Christion, G. D.
14. An Introduction to Practical Biochemistry, Plummer, D. T.
15. Sandhu, G. S., 1990. Research Techniques in Biological Sciences, Anmol Publications, New Delhi.
16. Srivastava, P. K., 2006. Elementary Biophysics. An Introduction, Narosa Publishing House, New Delhi.
17. Varghese, T. and Balakrishna, K. M., 2012. Nanotechnology – An Introduction to Synthesis, Properties and Applications of Nanomaterials. Atlantic Publishers and Distributors (P) Ltd., New Delhi.
18. Weesner, F. M., 1960. General Zoological Microtechniques. The Willams & Wilkins Co., Baltimore, USA.

Animal Physiology

Practical

1. Estimation of haemoglobin – Any method.
2. Determination of erythrocyte sedimentation rate (ESR)
3. Detection of haemin crystals in blood.
4. Estimation of salt loss in fish.
5. Estimation of salt gain in fish.
6. ECG, EEE, conditioned reflex, Kymograph Sphymomanometer – Chart.
7. Rate of oxygen consumption in a fish
8. Opercular activity of fish in relation to salinity
9. Opercular activity of fish in relation to temperature.
10. Qualitative analysis of excretory products in Ammonotelic, Ureotelic and Uricotelic animals.

Biostatistics and Bioinformatics

Practical

1. Diagrammatic and graphic presentation of any data collected from the college campus.
2. Calculation of mean, median, mode, standard deviation, standard error, variance and coefficient of variation - individual observation.
3. Calculation of mean, median, mode, standard deviation, standard error, variance and coefficient of variation – continuous series.
4. Calculation of correlation coefficient – length and width of leaves.
5. Calculation of correlation coefficient – height and weight of students in the class.
6. Calculation of regression co-efficient using length and weight of leaves.
7. Probability experiment with coin tossing (one coin, two coins and three coins).
8. Test of significance for small samples – one sample and two samples – student's t test.
9. Verifying the biasedness of the coin, Mendel's monohybrid cross and dihybrid cross using chisquare test.
10. PubMed, NCBI, EMBL, SWISS-PROT – printout.

Aquaculture

Practical

1. Morphometry of a pond
2. Estimation of fish population using mark and recapture method
3. Estimation of primary productivity of macrophyte
4. Physical chemical analysis of dissolved oxygen, salinity and alkalinity in any two water samples
5. Study of fish pathology
6. Taxonomic description of cultivable fishes(Indian major carps, 3exotic carps, Heteropneustes fossilis, Oreochrompus mossambica
7. Collection & identification of fresh water and marine planktons
8. Morphological feature of paenaid and non paenaid prawn
9. Determination of age of fishes.
10. Visit to an aquatic ecosystem- submit the report.

Biotechnology

- Unit I** : Principles of genetic engineering - Recombinant DNA technology - restriction endonucleases – linkers, adapters, vectors and ligases – transformation – selection of recombinants, hybridization techniques – Southern and Northern blotting techniques.
- Unit II** : Plasmid Biology – Cloning vectors based on pBR 322, lamda phage, yeast, Simian Virus 40 and cloning vector for *Agrobacterium tumifaciens* – gene transfer technology – transformation – Electrophoration - microinjection – particle bombardment – liposome fusion techniques.
- Unit III** : Bioreactor – microbial products – primary and secondary metabolites – antibiotics – hybridoma technology and monoclonal antibodies – wine production – biopesticides – biofertilizers – botanical pesticides – biosensors
- Unit IV** : Medical Biotechnology – Application of RFLP in forensic science – disease diagnosis using ELISA – microbial transformation for production of important pharmaceuticals (enzymes, hormones, steroids and semi synthetic antibiotics)
- Unit V** : Nano biotechnology – introduction to super small particles and nanofabrication – nanolithography – nanotubes and bucky balls – Applications of Nanobiotechnology – drug delivery systems – drug discovery – health risks concerns of Nanobiotechnology

Reference Books

1. Biotechnology by Sathyanarayana (2007) Uppala Another Publisher Interlinks, vijayawada
2. Introduction to Genetic Engineering by Ignacimuthu (2005) Blackwell Science Publications
3. Biotechnology by Purohit S.S (2008) Students edition – Nerosh Publishing house New Delhi
4. Biological Molecules in Nanotechnology – By Ratner M and Ratner D – Nerosh Publishing house, New Delhi.

Genetics

- Unit I** : Genetic Transmission : Concepts and definitions. Mendelian principles – Allelic and non-allelic interactions – Pleiotropy – Penetrance and Expressivity – Phenocopies – Multiple alleles – polygenic inheritance.
- Unit II** : Gene Fine Structure : Simple and split genes – Cistron, recon, muton, intro and exon – Gene Expressions : Genes on protein synthesis – Genetic code : redundancy and wobble hypothesis – works of Khorana and Kornberg – Regulation of gene action.
- Unit III** : Chemistry of DNA – DNA damage and repairing mechanisms – Transposable elements – Inbreeding and outbreeding : Inbreeding depression, Heterosis – Somatic cell hybridization – Eugenics, Euthenics, Euphenics – Extra chromosomal inheritance : Kappa particle and shell ceiling – Estimation of Heritability.
- Unit IV** : Population Genetics : Mendelian population – Gene pool and gene frequency – Hardy Weinberg law, Applications of Hardy-Weinberg law in calculating gene frequencies in a population – Calculation of gene frequencies for sex linked genes – Factors affecting Hardy – Weinberg equilibrium.
- Unit V** : Human Genetics : Pedigree analysis – Amniocentesis – Inborn errors metabolism – Sickle cell anemia – Karyotype – Twins – Chromosomal abnormalities – Genetic Pregnosis – Genetic Counselling – Gene Therapy – Drugs on Human heredity – simple Mendelian traits in man – genetic analysis of complex traits – Threshold traits – DNA finger printing and dermatoglyphics – Genetics and social behavior.

Reference books :

1. Elof Axel Carlson, 1985. Human Genetics. Tata Mc Graw-Hill Publishing Co., New Delhi.
2. Jain, H. K., 1999. Genetics : Principles, concepts and implications, Oxford & Publishing Co., New Delhi.
3. Benjamin Lewin, 1997. Genes VI, Oxford University Press, Oxford.
4. Sandhya Mitra, 1994. Genetics – A blueprint of life. Tata Mc Graw Hill Publishing Co., New Delhi.
5. Strickberger, M. W., 1996. Genetics, 3rd Edn., Prentice Hall of India, New Delhi.
6. Gardner et al., 1991. Principles of Genetics, 8th Edn., John Wiley & sons Inc., New York.
7. Stansfield, W. D., 1991. Schaum's Outline of theory and problems of Genetics, 3rd Edn., Schaum's Outline Series, Mc Graw Hill Inc., New York.
8. Stent, G. S. and Calender, R., 1986. Molecular Genetics : An introductory narrative, 2nd Edn., CBS Publishers & Distributors, New Delhi.
9. Goodenough, U., 1984. Genetics, 3rd Edn., Saunders College Publishing, New York.
10. Miglani, G. S., Fundamentals of Genetics, Narosa Publishing House, New Delhi.
11. Lewis, Genes X – Jones and Bartlett Publishers, Oxford Publication.
12. Michael R. Commings, Genage Learning Pvt. Ltd., New Delhi.

Immunology

- Unit I :** Origin of Immune system in Invertebrates. Origin of vertebrate Immune system. Innate immunity : First line of defense – skin, gastrointestinal tract, urinogenital tract, mammary gland, respiratory tract. Second line of defense : physiological barriers, Alternate pathway of complement, endocytosis, phagocytosis (oxygen dependent and oxygen independent). Third line of defense : Inflammatory response. Mechanism of innate immune recognition. Acquired immunity : Naturally acquired passive immunity, Artificially acquired passive immunity, Naturally acquired active immunity, Artificially acquired active immunity. Cells of immune system : Lymphoid lineage –T cells and its types, B cells and its types, Null cell and its types - Myeloid lineage –Eosinophil, Basophil, Neutrophil, Mast cell, Platelets, Monocytes , Macrophages, Antigen presenting Cells. Organs of immune system : Primary lymphoid organs - Thymus, Bone marrow, Bursa of Fabricius. Secondary lymphoid organs - Lymph node, Spleen, Payers patches, Tonsil
- Unit II :** antigens : Properties and types of antigen, Adjuvants, Epitopes, Haptens, Super antigen. Antibodies (immunoglobulins) : Immunoglobulin structure and function - Immunoglobulin classes –IgG, IgM, IgA, IgE, IgD. Major histocompatibility complex (MHC) : Structure of MHC molecules, Class I, II and III MHC molecules, Distribution and Regulation of MHC Expression. Antigen –antibody interaction and hypersensitivity : Antigen – Antibody interactions - Propitiate reaction, Immunodiffusion, Radial immunodiffusion, Immuno electrophoresis, Two dimensional immuno electrophoresis, Counter current immuno electrophoresis, Agglutination reaction, Radio immune assay (RIA), Enzyme Linked Immunosorbent Assay (ELISA), Immuno fluorescence, Western Blotting. Hypersensitivity - Type I –Anaphylactic hypersensitivity, Type II –Antibody dependent cytotoxic hypersensitivity, Type III –Immune complex mediated hypersensitivity, Type IV – Cell mediated hypersensitivity, Type V –Stimulatory hypersensitivity. Complement system : Complement compound, Classical

complement pathway, Alternative complement pathway, Consequents of complement activation, Complement deficiencies.

Unit III : b -cell maturation, activation and differentiation : B Cell maturation, Bone marrow micro environment, Ig –gene rearrangements and formation of pre B-Cells receptor, selection of immature self reactive B Cells, B Cell activation and proliferation. T–cell maturation activation and differentiation : T –Cell maturation, discrete stages in early T cell development, Thymic selection of T cell repertoire, T cell activation, costimulation in T cell response, T cell clonal anergy. Antigen processing and presentation :Cytosolic pathway of antigen presentation, Endocytic pathway of exogenous antigen presentation. Effectors responses of cell mediated and humoral immunity : Cell mediated direct cytotoxic response, Natural killer cell mediated cytotoxicity, Antibody dependent cell mediated cytotoxicity, Regulation of immune effectors response, Immunological memory. Cytokines : General properties and functions.

Unit IV : Immune response infectious diseases : Immune response against viral infection, Immune response against bacterial infection, Immune response against protozoan parasites, Immune response against helminthine parasites. Autoimmune diseases : Organ specific autoimmune diseases, Diseases mediated by direct cellular damage, Diseases mediated by stimulating or blocking antibodies, Systemic auto immune diseases, Treatment of autoimmune disease. Immuno deficiency diseases :Phagocytic deficiencies, Humoral deficiencies, Cell mediated deficiencies Combined immuno deficiencies.

Unit V : Transplantation immunology : Classification of grafts, Method of graft rejection, Graft versus host reaction, Tissue and organ transplantation, Immuno suppressive therapy during transplantation, Immunological tolerance –Mechanism of tolerance. Immunology of tumors : Tumor antigens, Immune response to tumor antigens, Immunologicalsurveillance, Immune therapy of cancer. Vaccines : Vaccines from whole organisms, Polysaccharide vaccines, Outer membrane protein vaccines,

Toxoid vaccines, Vaccines from recombinant vectors, DNA as vaccines, Vaccines from synthetic peptides.

Text books:

1. C.V.Rao, An Introduction to Immunology Narosa Publishing House, 35, Greams Road, Thousand light, Chennai -600006.
2. Immunology, 2007. I.Kannan. MJP Publishers, Chennai.

Reference books:

1. Janis Kuby, Immunology W.H.Freeman and Company, New York.
2. Klans.D.Elger, Immunology Wiley –Liss Pub. Co. U.S.A.
3. R.M.Coleman, M.F.Lomb and R.E.S.Cord Fundamental Immunology 2nd Edn. W.C.Brown Publishers U.S.A.
4. I.M.Roitt, Essential Immunology E.L.B.S.
5. Donald M.Weir and John Shewart Immunology Churchill Livingstone 9th Edn.
6. Geroge Pinchuk 2004.Schum’s Outlines Immunology Tata McGraw –Hill.
7. Aruna Bhatia Manual of Practical Immunity Vikas Pub. House Ltd., New Delhi.
8. Talwar .G.P. A hand book practical immunology - Third edition ,Backwell scientific publication-ISBN 0-632-01491-1

Animal Physiology

Practical

11. Estimation of haemoglobin – Any method.
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17. Collection & identification of fresh water and marine planktons
18. Morphological feature of paenaid and non paenaid prawn
19. Determination of age of fishes.
20. Visit to an aquatic ecosystem- submit the report.

Biotechnology

Practical

1. Estimation of citric acid in citrus fruits
2. Preparation of wine
3. Preparation of bread - Demonstration
4. Preparation of yoghurt - Demonstration
5. Diagnosis of diseases using ELISA - Demonstration
6. Preparation of Vermicompost - Demonstration
7. Extraction of genomic DNA from bacteria - Demonstration
8. Demonstration of Southern and Northern blotting techniques
9. Flow Charts - Antibiotics production and Bioreactor.
10. Spotters
 - pBR322
 - Lamdapage
 - Dolly
 - RAPD
 - Gene cloning
 - Stem cells

Practical

Genetics

1. Analysis of simple mendelian inheritance in a small population.
2. Breeding experiments to be demonstrated with the help of colour beads – Monohybrid cross. (Chisquare test not required).
3. Breeding experiments to be demonstrated with the help of colour beads – Dihybrid cross. (Chisquare test not required).
4. Estimation of gene and genotype frequencies in the light of Hardy-Weinberg law based on facial traits.
5. Estimation of gene and genotype frequencies in the light of Hardy – Weinberg law based on ABO blood groups.

6. Random genetic drift – using colour beads.
7. Analysis of dermatoglyphic patterns.
8. Charts, models and flash cards pertaining to theory syllabus
 - a. DNA replication
 - b. Karyotyping
 - c. Operon concept
 - d. Transposable elements.
 - e. Syndrome

Inborn errors of metabolism.

Practical

Immunology

1. ABO blood grouping by haemagglutination technique.
2. Immunodiffusion technique.
3. Separation of blood cells by centrifugation.
4. Counting of white blood corpuscles and red blood corpuscles.
5. Primary and secondary lymphoid organs in man (chart).
6. Lymphoid organs in rat (chart).
7. Cells of immune system – (slides).
8. Immunoglobulin G (chart).
9. Monoclonal antibody preparation (chart).
10. Histology of lymphoid organs: Primary organs – Thymus, Bone marrow. Secondary organs – Lymphnode, Spleen. (slides).

MSU / 2016-17 / PG-Colleges / M.Sc.(Zoology) / Semester-IV / Ppr.no.22 / Project

Major Project

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.A. (English)

(Choice Based Credit System)

(With effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem.	Sub 'Pr.No.	Subject status	Subject Title	Hrs/ week	Cre dits	Marks				
						Maximum			Passing Minimum	
						Int.	Ext	Tot.	Ext.	Tot
III	11	Core - 9	Literary Theory and Criticism II	6	4	25	75	100	38	50
	12	Core -10	Research Methodology	6	4	25	75	100	38	50
	13	Core - 11	World Literature in English Translation	6	4	25	75	100	38	50
	14	Core - 12	Shakespeare	6	4	25	75	100	38	50
	15	Elective - III	Commonwealth Literature	6	5	25	75	100	38	50
IV	16	Core - 13	Literature and Ecology	6	5	25	75	100	38	50
	17	Core - 14	Diasporic Women's Writing	6	5	25	75	100	38	50
	18	Core - 15	Language, Literature and Media	6	5	25	75	100	38	50
	19	Elective - IV	History of English Language and Linguistics	6	4	25	75	100	38	50
	20	Project	Dissertation	6	5	50	50	100	25	50

Literary Theory and Criticism - II

Unit – I

Mark Schorer - from *Technique as Discovery*
Roman Jakobson - “Two Aspects of Language and Two
Types of Aphasic Disturbances”

Unit – II

Jonathan Culler - “Structuralism and Literature”
Roland Barthes - “The Death of the Author”

Unit – III

Terry Eagleton - from *Literary Theory: An Introduction*
Stephen Greenblatt - “Resonance and Wonder”

Unit – IV

Edward Said - “Introduction” to *Orientalism*
Homi Bhabha - “Introduction” to *Location of Culture*

Unit – V

Sandra Gilbert & Susan Gubar – excerpt from *The Madwoman in the
Attic*
Simone de Beauvoir - “Woman as the Other” from *The Second Sex*
Patricia Waugh - “Postmodernism and Feminism”

Source Texts

1. S. Ramaswami & V.S. Sethuraman. *The English Critical Tradition: An Anthology of English Literary Criticism*. Vol 2 Chennai: Trinity Press
2. *Modern Literary Theory: a Reader* Eds. Philip Rice & Patricia Waugh. London: Bloomsbury
3. Rohan Savarimuthu. *Literary Theory and Criticism since 1930*. Chennai: New Century Book House.
4. *The Norton Anthology of Theory and Criticism. 2nd Edition*. Eds. Cincet B. Leitch et al. New York: W.W. Norton & Company.

Recommended Reading

1. Elaine Showalter. *The New Feminist Criticism*
2. Jonathan Culler. *Literary Theory: A Very Short Introduction*
3. Peter Barry. *Beginning Theory: An Introduction to Literary and Cultural Theory*
4. Terry Eagleton. *Literary Theory: An Introduction*

Research Methodology

Unit – I

Research and Writing
Plagiarism and Academic Integrity

Unit – II

The Mechanics of Writing

Unit – III

The Format of the Research Paper
Abbreviations

Unit – IV

Documentation: Preparing the list of Works Cited

Unit – V Novel

Documentation: Citing Sources in the text

Reference:

MLA Hand Book for Writers of Research Papers – 7th Edition

World Literature in English Translation

Unit – I Poetry

Virgil - The Aenied (Book I Lines 1 – 222)

Unit – II Prose

St. Augustine - The Confessions (Book I Chapter 1 – 19)

Unit – III Drama

Sophocles - Oedipus Rex

Bertolt Brecht - Mother Courage and Her Three Children

Unit – IV Short Stories

Anton Chekov -

Saadat Hasan Manto - The Price of Freedom

Guy de Maupassant -

Leo Tolstoy - God Sees the Truth but Waits

Unit – V Fiction

Albert Camus - The Stranger

Orhan Pamuk - My Name is Red

Shakespeare

Unit – I

Midsummer Night's Dream

Unit – II

Hamlet

Unit – III

Measure for Measure

Unit – IV

Antony and Cleopatra

Unit – V

General Shakespeare
Quartos and Folios
Textual Criticism
Shakespearean Criticism
Historical Plays
Narrative Poems

Reference:

A.C. Bradley – Shakespearean Tragedy
G. Wilson Knight –
A.W. Pollard – Shakespeare Folios and Quartos
Britannica Encyclopedia on Shakespeare

Commonwealth Literature

Unit – I Poetry

Derek Walcott -	“Ruins of a Great House”
	“A Far Cry from Africa”
Mervyn Morris -	“Judas”
Razia Khan -	“My Daughter’s Boyfriend”
Judith Wright -	“The Harp and the King”

Unit – II Drama

Mahesh Dattani -	Thirty Days in September
George Ryga -	Indian

Unit – III Fiction

Patrick White -	The Tree of Man
Bapsi Sidhwa -	Ice Candy Man

Unit – IV Fiction

Margaret Laurence -	Diviners
Buchi Emecheta -	The Joys of Motherhood

Unit – V Non-fiction

Chinua Achebe -	Thoughts on the African Novel
Arundhati Roy-	Walking with Comrades

Literature and Ecology

Unit – I Introduction

Ecology, Literature and Language

Peter Barry – Beginning Theory

Unit – II Poetry

S.T. Coleridge	-	To Nature
Emily Dickinson	-	Summer Shower
Robert Frost	-	The Oven Bird
Sri Aurobindo	-	The Tiger and the Deer
Toru Dutt	-	Our Casuarina Tree
Muhammed Iqbal	-	A Mountain and a Squirrel

Unit – III Prose

C. Rajagopalachari	-	Tree Speaks
Terry Tempest William	-	Refugee: An Unnatural History of Family and Place
Margaret Atwood	-	Survival – Chapter I Nature the Monster

Unit – IV Fiction

Amitav Ghosh	-	The Hungry Tide
Margaret Atwood	-	Surfacing
Indira Sinha	-	Animal's People

Unit – V Drama

William Shakespeare	-	As You Like It
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Reference:

1. *The Eco Criticism Reader: Landmarks in Literary Ecology* by Harold Fromm and Cheryll Glotfelty
2. *The Environmental Imagination: Thoreau Nature Writing and the Formation of American Culture* by Lawrence Buell
3. *Bloomsbury* by N. Krishnaswamy

Diasporic Women’s Writing

Unit I Poetry

Chitra Banerjee Divakaruni	-	Cutting the Sun
DebjaniChatterjee	-	My Mother Combs My Hair All Whom I Welcome Leave Just Middling
Meena Alexander	-	Aftermath For My Father, Karachi 1947

Unit II Prose

ChimamandaNgoziAdichie	-	We Should All Be Feminists
MeenaAlexander	-	Poetics of Dislocation (from <i>Poetics of Dislocation</i>)

Unit III Drama

Uma Parameshwaran	-	Sons Must Die
Julia Cho	-	99 Histories OR
Jean Yoon	-	Hongbu and Nolbu : The Tale of Magic Pumpkins

Unit IV Fiction

Gita Hariharan	-	Fugitive Histories
JumphaLahiri	-	The Lowland

Unit V Fiction

ZadieSmith	-	White Devil
MeeraSyal	-	Anita and Me

Reference:

- MeenaAlexnader,*Poetics of Dislocation* ,University of Michigan Press,2009.
MeenaAlexnader, *The Shock of Arrival*, South End Press, Boston,1996.
Esther Kim Lee(Editor), *Seven Contemporary Plays from the Korean Diaspora in the Americas*, Duke of University Press,2012.
ChimamandaNgoziAdichie, *We Should All BeFeminists*, Vintage Books 2012.
Joel Kurotti, *Writing Imagined Diasporas: South Asian Women Reshaping North American Idnentity*, Cambridge Scholars Publishing, Newcastle, 2007.
MukeshYadev, *The Panorama of South-Asian Diaspora Literature*, Yking Press, Jaipur, 2012.
Arvind Kumar Jha and Ram Kumar Naik, *Indian Diaspora Literature in English*, Raj Publication, New Delhi, 2014.
Uma Parameshwaran, *Sons Must Die* and Other Plays, (South Asian and Canadian Literature Series), Prestige, New Delhi 1998.

Language, Literature and Media

Objective:

- To expose the learners to the production of diversely mediated meanings of the media
- To help the learners to incorporate an understanding of the tools and techniques employed by personalities other than writers
- To understand the semiotic signs that are available in the movies

Unit I

- | | | |
|----------------------------------|---|---|
| Sally Johnson and Astrid Ensslin | - | Language in the Media: Theory and Practice |
| George Yule | - | The Study of Language (Chapter 20)
Culture
Categories: Kinship and Time Concepts
Cognitive and Social Categories
Gendered Words, Speech and Interaction |

Unit II

- | | | |
|---------------|---|--|
| Adam Jaworski | - | Language in the Media: Authenticity and Othering |
| Umberto Eco | - | Casablanca: Cult movies and Intertextual collage |

Unit III

- Film Appreciation: Fantasy Literature Series
1. *Frozen*
 2. *The Chronicles of Narnia: The Voyage of the Dawn Treader*

Unit IV

- Film Appreciation: Magic/Action Literature Series
1. *Harry Potter and the Sorcerer's Stone*
 2. *I, Robot*

Unit V

- Film Appreciation: Historical Literature Series
1. *Exodus: Gods and Kings*
 2. *Ramayan, "Prince of Ayodhya"*

Reference:

George Yule. *The Study of Language Fifth Edition*. Cambridge University Press.
Sally Johnson and Astrid Ensslin. *Language in the Media*.

History of English Language and Linguistics

Unit – I English Language

Place of English in the Indo-European Family of Languages
Old English, Middle English, Modern English, Global English,
Grimm’s Law, Verner’s Law

Unit – II Influences

Latin, French, Greek, Scandinavian and Standard English

Unit – III Linguistics

What is Linguistics?
Modern Linguistics: A Historical Survey

Unit – IV

I C Analysis
TG Grammar

Unit – V Phonetics

Phonetics: Classification of English Vowels and Consonants
Stress and Intonation
Transcription

Reference:

F.T. Wood – An Outline History of English Language
Phonetics: Macmillan Publication
Peter Roach – English Phonetics and Phonology. Cambridge University Press.
Lalitha Ramamoorthy – A History of English Language and Elements
Baugh, A.C. A History of the English Language (1973)
George Yule. *The Study of Language Fifth Edition.*

Dissertation Writing and Viva-Voce - Core

The students are expected to submit a Dissertation of about 50 pages on preferably a recent writer not included in the current syllabi.

The dissertation will be evaluated on the basis of the students' understanding of the topic, their knowledge of the fundamental aspects of research and their ability to document and present their work in accordance with the concepts of research methodology.

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

PG - COURSES – AFFILIATED COLLEGES

Course Structure for M. Com.

(Choice Based Credit System)

(With effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem	Sub No.	Subject status	Subject Title	Hrs/week	Credits	Marks				
						Maximum			Passing minimum	
						Int.	Ext.	Tot.	Ext.	Tot.
III	10	Core - 8	Advanced Corporate Accounting	6	5	25	75	100	38	50
	11	Core - 9	Research Methodology	6	5	25	75	100	38	50
	12	Core - 10	Taxation and Tax Planning	6	5	25	75	100	38	50
	13	Core - 11	E- Commerce	6	5	25	75	100	38	50
	14	Core -12	Human Resources Management	6	5	25	75	100	38	50
IV	15	Core - 13	Advanced Cost Accounting	8	5	25	75	100	38	50
	16	Core - 14	Computerized Accounting Package Tally – 9.0*	8	5	25	75	100	38	50
	17	Elective - 3	Financial Markets	7	5	25	75	100	38	50
	18	Project	Project	7	5	50	50	100	25	50

Note:

For all problems involving paper 60% for problem and 40% for theory questions shall be asked.

ADVANCED CORPORATE ACCOUNTING

Unit I

Advanced Problems in Issue, forfeiture and Redemption of shares & Debentures, underwriting – Valuation of Goodwill and Shares.

Unit II

Amalgamation – Absorption and Reconstruction of companies.

Unit III

Company Final Accounts – Liquidators Final Statement – Accounts of Holding Company.

Unit IV

Accounts of Banking and Insurance Companies – Double Account System.

Unit V

Accounting Standards Meaning, Objectives, Benefits – AS Boards of India – AS issued by ICAI – International Financial Reporting Standards (IFRS) – AS convergence to IFRS Need – Benefits – IFRS in India.

Reference Books :

1. Jain, S.P. & Narang, K.L – Advanced Accountancy, Kalyani Publishers, New Delhi. 2013.
2. Gupta R.L. – Advanced Accountancy, Sultan Chand & Sons, New Delhi.

RESEARCH METHODOLOGY

UNIT – I

Research and research methodology – Methods of social research – Scope for research – Procedures in research – Fact concepts and theory – Scientific method.

UNIT – II

Selection and formulation of research problem – Research design – sampling design – Methods – Sample size determination - Sampling errors – Causes and control – Selection of appropriate method of sampling.

UNIT –III

Methods of data collection – Primary - Questionnaire – Observation methods – Designing questionnaire / Interview schedules – Secondary data.

UNIT - IV

Statistical analysis – Brief Introduction to computer software to do statistical analysis and websites – Diagram – Graphs – Commonly used statistical tools in research – Scaling techniques.

UNIT –V

Processing of data – Analysis of data – Interpreting statistical / Graph data- Research Report – Problems and precautions – Conventions in writing a Research Report – Annexure Bibliography.

Books for reference:

1. Kothari, C.R., Research Methodology: Methods and Techniques, New Age International, New Delhi, 2013.
2. Zikmund, William G., Business Research Methods, Thomson Asia, Singapore,2003.
3. Krishnaswami O.R, “Methodology of Research in social science”, Himalaya publishing House,Mumbai 2003.
4. Copper, Donald R. and Pamela S. Schindler,Business Research Methods, Tata McGraw-Hill,New Delhi,2003.
5. Gupta S.P. (2005) Statistical methods,Sultanchand&sons , New Delhi

TAXATION AND TAX PLANNING

Unit I

Income Tax Act 1961 – Basic Concepts – Capital and Revenue – Residential Status – Incidence of Tax- Exempted Income.

Unit II

Computation of Taxable Income under various heads – Salary – House Property – Profits and Gains of Business or Profession – Capital Gains – Income from other sources.

Unit III

Clubbing of Income – Setoff, set off and carry forward of losses – Deduction from Gross Total Income – Computation of Tax liability.

Unit IV

Assessment, Tax planning and Tax Management of Individual – Hindu undivided family firms and AOPs.

Unit V

IT Authorities – Procedure for Assessment – Collection of Tax – Recovery of Tax and Refunds

Reference Books:

1. H.C.Mehrotra and S.P. Goyal, Income Tax Law and - Practice.
2. K. Raajhavelu– Income Tax Law and Practice – Sri VenkateshwaraPadmawadhi Publications – Walajapet.
3. Dr. VinodSinghania – Income Tax – Taxmann publications Pvt. Ltd.

E-COMMERCE

Unit I:

Introduction to E-Commerce: Meaning, Significance and scope of E-commerce – Traditional Commerce and E-commerce – Advantages and disadvantages of E-commerce - Technical and Non-technical limitations of E-commerce. Online shopping sites in India.

Unit II :

Application of E-commerce : Basic in E-commerce – Introduction to E - commerce Modules – B2B Modules, Advantages and disadvantages of B2B – B2C Modules – Electronic Retailing and malls. The process of electronic shopping, Electronic Catalogs, interactive advertising, and marketing – Benefits and limitations of internet advertising – Impact of E- commerce on business opportunities in E- commerce.

Unit III:

Internet, Intranets and Extranets -Introduction to Internet – Components of Internet – Business use of the Internet – Categories of Internet – Intranet – Advantages and disadvantage of Intranet & Extranet -Relationship between Internet, Intranet and Extranet – Difference between Internet and Extranet-Mobile E-Commerce Technology (M-Commerce).

Unit IV:

Introduction to electronic data inter change [EDI] - definition, benefits of EDI, limitations of EDI, EDI transaction and EDI Application- SMTP,POP and FTP Protocols- Network Layers and TCP/IP Protocols

Unit V:

E-commerce Supporting Functions: Purchase and sale procedure- Supply Chain Management [SCM], Value chains in e-commerce, Value chain management – Electronic Payment system- authentication of payment, mode of payment. Electronic credit and debit cards, smart cards, and electronic cash -Risks in EPS – digital signature, Encryption, electronic certificate, Firewall, secure electronic transaction (SET) –Security issues in E-Commerce- protocols-SSL-SHTTP-Computer Crimes-Security in E-Commerce.

Books Recommended

- 1.E-Commerce and its Applications- U.S.Pandey, Rahul Srinivastava, SaurabhShukla-S.Chand&company Ltd
2. E-commerce – C.S.V. Murthy, Himalaya Publishing House
3. E-commerce – David Whiteley – McGraw Hill
4. E-commerce – P. Joseph – PHI
5. E-commerce – The cutting edge of business – K. Bajaj and Nog TMH.
6. Information Technology in business – J.A. Senn – Prentice Hall

HUMAN RESOURCE MANAGEMENT

Unit –I

Human Resource Management-Meaning – Definition –Objectives –Need – H.R. Planning –H.R. Function – H.R.Philosophy – Strategic Human Resource Management – Trends in HRM –Role of HR managers.

Unit- II

Job Design –Job Analysis – Job Description –job Specification –Recruitment –Source and Techniques – Assessment of Recruitment Programme –Selection –Procedure- Test – Basic Testing Concepts –Types of Test –Interview –Types – Interview Process –Qualities of a Successful Interviewer –Common Interviewing Mistakes –Placement.

Unit –III

Training –Meaning –Importance –Benefits –Need –Training Vs Development – Training Objectives –Principles –Methods –Assessment of Training Needs –Assessment Methods –Management Development –Objectives –Essential Ingredients of the Management Development Programme – Techniques of Management Development - On the Job and Of the Job Techniques –Performance Appraisal –Meaning –Need –Purpose –Methods –Essential Characteristics of an Effective Appraisal System –Uses – Problems –Advantages.

Unit- IV

Job Evaluation –Meaning –Objectives –Principles – Procedures –Methods –Problems –Rewards –Types –Financial Vs Non- Financial Rewards –Salary Administration –Concepts –Need – Objectives –Principles –Elements –Factors Affecting Wage/Salary Levels –Fringe Benefits – Need for Extending Fringe benefits –Objectives –Types –Non Monetary Rewards.

Unit –V

Industrial Relations –Meanings –Characteristics –Objectives –Functions –Conditions-Factors – Actors –HRM Vs IR –Approaches –Trade Union – Meanings – Definition – Characteristics –Functions – Methods of Achievement of Objectives – Union Structure – Problems – Measures to strengthen Trade Union Movement in India –Collective Bargaining – Definition – Characteristics –Importance – Need –Principles –Essential Conditions for the Success of Collective Bargaining –Functions –Collective Bargaining Process –Grievance Procedure and Discipline Procedure.

Books For Reference

1. Human Resource Management- C.B .Gupta. Sultan Chand&Sons
2. Human Resource Management –L .M .Prasad.Sultan Chand &Sons.
3. Essentials of Human Resource Management and Industrial Relations –P. SubbaRao.Himalaya Publishing House.
4. Personal Management – C.B .Memoria, S. V.Gankar .Himalaya Publishing House.
5. Human Resource Management –K. Aswathappa . Tata McGraw Hill Education Private Ltd.

ADVANCED COST ACCOUNTING

Unit I

Costing – Meaning, Definitions- Difference between cost and financial accounts – Analysis of Cost and Cost Centre – Cost concepts - Installation of Cost System – Preparation of cost sheet – Tenders and Quotations.

Unit II

Elements of Costing – Cost determination and Control over Individual elements of Costing – Accounting for Material, labour and overheads.

Unit III

Methods of Costing – Job Costing – Process Costing – Job Costing Vs. Process Costing – Process losses – Inter Process Profit – Equivalent production – Joint products and By Profit Costing.

Unit IV

Contract Costing – Operating Costing – Transport Costing – Objectives – Classification of Costs, Selection of units, ascertainment of costs.

Unit V

Cost Control Accounts – Integrated Costing – Reconciliation of Cost and Financial Accounting – Cost Audit – Programmes and Procedures.

Reference Books :

1. Jain, S.P. & Narang, K.L. Cost Accounting, Kalyani Publishers, Agra. 2003
2. Wilson, M. Cost Accounting, Himalaya Publishing House, Bangalore, 2012.
3. Pillai.R.S.N&Bagavathy Cost Accounting, S.Chand& Co., New Delhi.

COMPUTERIZED ACCOUNTING PACKAGE – TALLY 9.0

Unit-I

Introduction to Tally

New features of Tally 9.0 – Tally screen components – Creating company in Tally – company features – creating accounting ledgers – creating inventory ledgers – creating stock item, stock group, stock category – Creating cost categories and cost centers- types of vouchers- POS –types of Accounting and Inventory vouchers – Trial balance – Final accounts with adjustments.

Unit-II

Value Added Tax

Meaning of VAT –General technologies used in VAT – VAT rates – computation of VAT – VAT classification – ledger creation for VAT – Voucher entry – Input credit adjustments for capital goods- features of composite dealers – VAT composition computation report – VAT composition returns.

Unit-III

TDS,TCS and ST

Features of TDS – creation of ledgers in TDS – account classification of TDS – TDS deduction for advance payment and balance payment – TDS computation report – TDS pending statement – features of TCS – TCS on contracts, license and lease – TCS reports – Features of Service tax – creation of ledgers and input credit adjustment of service tax – service tax reports.

Unit-IV

Excise dealer and BRS

Basic concepts of Excise dealer – creating ledgers, vouchers in Excise dealer – Dealer Excise report – Excise stock register – Bank Reconciliation Statement – Need and importance of BRS – Reasons for the difference between pass book and cash book – process of reconciliation – ledger creation and effective date for reconciliation.

Unit-V

Pay Roll

Features of Tally Pay roll info menu – create pay heads – employee groups – salary details – units of attendance – pay sheet report – pay slip – pay roll statement report – pay roll register – pay roll with PF and ESI.

Reference Books:

1. **A.K. Nadhani and K.K.Nadhani** ,”Implementing Tally”, BPB Publications.
2. **P.Mohan**, “Information Technology for Business”, Himalaya Publishing House.

External: 75 Marks (Practical)

Record Note	= 25 Marks
Program / Procedure writing	15 x 2 = 30 Marks
Debugging	5 x 2 =10 Marks
Result	5 x 2 =10 Marks
	=====
Total	75 Marks
	=====

Note :

- a) There is no external theory examination for this subject. Only practicals shall be conducted as external examination.

But for internal, as like other theory subjects marks shall be awarded as below:

- | | | |
|-----|--|-------------|
| i) | The average of the best two scores of the student from three tests of an hour duration shall be averaged | -- 15 marks |
| ii) | Assignment | -- 4 marks |
| i) | Seminars | -- 6 marks |
| | | ----- |
| | | 25 marks |
| | | ===== |

- b) Practical examination should be conducted by both internal and external examiners

- c) Examiners are requested to select any 2 batches in the morning session and other two in the evening session.

Batch I	Set	A	B	C
Batch II	Set	D	E	F
Batch III	Set	B	D	E
Batch IV	Set	A	C	F

List of Practicals

1. Accounting ledgers and vouchers creation
2. Inventory ledgers and vouchers creation
3. Ledgers and vouchers creation of VAT
4. VAT composite dealers
5. Ledgers and vouchers creation of TDS
6. Ledgers and vouchers creation of TCS
7. Ledgers and vouchers creation of ST
8. Ledgers creation and preparation of BRS
9. Ledgers and vouchers creation of Excise dealer
10. Ledger creation of POS
11. Ledger and vouchers creation of payroll
12. Final account and its adjustments
13. Trial balance

FINANCIAL MARKETS

UNIT –I

Indian Financial Systems

Financial System and its Functions-Financial concepts-Financial Assets-Financial intermediaries-Financial Markets-Classifications-Capital Market-Classification- Money Market –Classification-Foreign Exchange Market-Financial Instruments-Financial System and Economic Development-Weakness of Indian Financial System.

UNIT-II

Money Market

Definition-Characteristics-Objectives-Money market Vs Capital market-Features of a Developed Money market-Importance of Money Market –Composition of Money Market – Call Money Market-Commercial Bill Market-Treasury Bill Market-Money market Instruments- Structure of Indian Money market- Features –Recent Developments.

UNIT-III

New Issues Market

New Issues Market-Meanings- Functions-Methods of floating New Issues- General guidelines for New Issues Principal steps of a Public Issues- Instruments in New Issues Market-Players in New Issues Market- Recent Trends- Advantages and Disadvantages of Primary Market- Stock Exchange-Distinction between New Issues Market and Stock Exchange

UNIT-IV

Secondary Market

Introduction-Services of Stock Exchanges- Organisation of Stock Exchanges in India Traditional Structure of Stock Exchanges- Recognition of Stock Exchanges-Listing of Securities- Registration Procedures of Stock Brokers-On Line Trading- Genuine Trading Vs Speculative Trading- Defects of Indian Secondary market- Recent Developments.

UNIT-V

SEBI, OTCEI and NSE

SEBI- Objectives- Functions- Powers- Organisational set up-SEBI guidelines to- Primary Market-Secondary Market – Foreign Institutional Investors – Bonus Issue- Right Issue- Investors Protection- Recent Reforms-Features of OTCEI- Promoters and Participants- Trading in OTCEI Exchange- Listing Operational High Lights- NSE- Objectives – Features – Stock Exchange Vs NSE Vs OTCEI

Books For Reference

1. Financial Markets and Services .Gardon .Natarajan.Himalaya Publishing House.
2. Banking and Financial Systems.D.M.Mittani. E. Gardon. Himalaya Publishing House.
3. Financial Institutions and Markets. L. M. Bhole,JitendraMahakud. Tata McGraw-Hill education Private Ltd.
4. Merchant Banking and Financial Services, S.Guruswamy, Vijay Nichole Imprints Private Limited
5. Financial Markets and Institutions, S.Gurusamy, Vijay Nichole Imprints Private Limited

MSU / 2016-17 / PG –Colleges / M.Com / Semester –IV/Ppr.no.18 /Project

Major Project

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12
M. Phil. BOTANY
(For all affiliated Colleges)
(Curriculum Effective From July 2018 Onwards)

Objectives of the program

To provide a holistic understanding in depth to the scholars in the specific area of research

To equip the researchers with complete comprehension on the tools techniques used in botanical research

To make the scholars to develop critical and analytical thinking towards research and enable them for independent writing of research manuscripts, articles review papers and thesis

Course Structure for M. Phil. Program in Botany – 2018 onwards

S. No.		Name of the course	Hrs/ week	Credits
	Semester I	CORE PAPERS		
1		Research and Teaching Methodology	4	4
2		Advances in Plant Science	4	4
		ELECTIVE PAPERS (any One)		
3		Plant Conservation Biotechnology	4	4
4		Developmental Botany & Plant Biotechnology		
5		Phytochemistry and Pharmacognosy		
6		Bio fertilizers and Plant Responses		
7		Soil Fertility and Plant Nutrition		
8		Ecology, Biodiversity and Sustainability		
9		Taxonomy of Angiosperms		
10		Plant Anatomy and Reproductive Biology		
11		Algal Technology		
12		Bryophyte Systematics and Evolution		
13		Ethnomedicine		
14		Marine Botany		
15		Vascular Cryptogams		
	Semester II	MINI PROJECT		
		Project and viva voce		12
		Total		24

RESEARCH AND TEACHING METHODOLOGY

L	C
60	4

Objectives

- To understand the principles and operation of basic and advanced instruments required for doctoral research
- To analyse the scientific findings and data by applying certain statistical methods and software
- To learn the methods of teaching and carrying out scientific research, documentation and communication

Unit I Microscopic and Analytical techniques (15 hrs)

Microscopy - principles and applications. Properties of electromagnetic radiation - Light, Phase contrast and Fluorescence microscopy. Electron Microscopy-Principles and applications of TEM and SEM- Preparation of materials for Electron Microscope. Spectroscopic techniques- UV and Visible, Fluorescence, IR, NMR, AAS, AES and AFM. Electrochemical techniques- Radioisotope techniques-radioactivity, atomic stability and radiation-radiation decay. Detection and measurement of radioactivity and applications of Geiger-Müller and Scintillation Counter. Labelling of biological molecules and autoradiography.

Unit II Separation techniques (8 hrs)

Chromatography- Principles and applications - GC, GLC, HPLC, MS. Electrophoretic techniques-Principles and construction of horizontal and vertical electrophoresis-Buffers and electrolytic separation- detection by staining and estimation of electrophorograms gel documentation. Molecular techniques: PCR based-RFLP, RAPD, AFLP, SSR, blotting techniques.

Unit III Statistical Methods (10 hrs)

Population and sampling, data collection, analysis and graphical representation. Measures of Central Tendency, Measures of Dispersion-Standard Deviation, Correlation and Regression analysis, Probability -normal and binomial distribution. Statistical testing: F-test, t-test and chi-square test. Experimental design, ANOVA one way and two way analysis, statistical software-MS Excel and SPSS.

Unit IV Research Methods (12 hrs)

Research - Meaning - Role of a researcher – Hypothesis - Methods-Approaches Objectives. Literature and Reference collection. Role of libraries in research, virtual libraries, Internet-World wide web-searching and browsing tools- e-journals and e-books. Impact factor, H- index, citation. Manuscript preparation- Citation and Proof correction, Thesis/Dissertation components - Introduction, Review, Materials and methods, Results - tables, figures, footnote, Discussion, Summary and Conclusion. Role of Supervisors/ Guides in research.

Unit – V Methodology of Teaching (15 hrs)

Teaching – Objectives of teaching, phases of Teaching – Teaching methods: lecture method, discussion method, discovery learning, Inquiry, Problem solving method, project method. Seminar- Integrating ICT in teaching: Individualised instruction, ways for effective presentation with power points, documentation - Evaluation; formative, summative & continuous and comprehensive Evaluation. Later Adolescent Psychology: meaning, physical, cognitive, emotional, Social and moral Development –Teaching later adolescents.

Reference Books:

1. Bryan C Williams and Keith Wilson 1983, A biologist's guide to practical techniques of Practical Biochemistry Second edition. Edward Arnold Publications.
2. David Plummer, 1988. An Introduction to Practical Biochemistry, Tata McGraw Hill Publishing Company, New Delhi.
3. George Casella and Roger L. Berger, 2003. Statistical Inference II Ed. Duxbury Advanced Series, Thomson Press.
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8. Steel and Torrie, 1986. Principles and Procedures of Statistics with special reference to Biological Sciences.
9. Kothari, C.R., 2004. Research Methodology Methods and Techniques, New Age International
10. Isaac, S., Michael, W., 1971. Handbook in research and evaluation, (2nd ed.), San Diego, USA
11. Gomez, K.A., Gomez, A.A., 1984. Statistical procedures for agricultural research, John Wiley & Sons.
12. Townend, J., 2012. Practical statistics for environmental and biological scientists, John Wiley & Sons.
13. Sampathkumar, K, Panneerselvam, A. & Santhanam, S. 1984. Introduction to educational technology 2nd revised ed. Sterling Publishers, New Delhi.
14. Sharma, S. R. 2003. Effective classroom teaching modern methods, tools and techniques. Mangal Deep publishers, Jaipur.
15. Vedanayagam, E. G. 1989. Teaching technology for college Teachers, Sterling publishers, New York.

ADVANCES IN PLANT SCIENCE

L	C
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OBJECTIVES

- To comprehend the important aspects of biodiversity and conservation methods
- To make the scholar abreast in advanced areas of plant science and the recent developments
- To equip the scholar to learn the theoretical and application concepts on economic and medicinal importance of plants

Unit 1- Climate change and plant diversity (12 hrs)

Biodiversity – Alpha, Beta, Gamma; Species, genetic and ecosystems diversity. Centres of origins of crops – Vavilov’s Theory, Mega biodiversity, centres of origin of genetic diversity, Plant Genetic Resources (IBPGR/ NBPGR). Endangered plants – IUCN categories, Red Data Books, *In Situ* and *Ex situ* conservation strategies. Components of the atmosphere, greenhouse gases & green house effect, global warming and climate change, sea level rise, increased CO₂ levels, impacts on plants. Carbon sequestration, carbon credits and economy and energy policy. Climate Change adaptation and mitigation strategies (UNEP/ FAO/ IPCC / GBIF / CBD).

Unit -2 Plant Physiology (12 hrs)

Photosynthesis recent concepts in Photosystems I & II, ATP complex. Chloroplast DNA. Water transport and utilization. Resource mobilization and allocation. Advances in auxin and cytokinin molecular synthesis and function. Biochemistry of plant animal interaction.

Unit – 3. Plant Energy (12 hrs)

The concept of energy richness in plants – lignocelluloses, sugars and terpenoids. Plants that produce fuel, wood, waxes, alcohol and hydrocarbons. Products include biodegradable plastics, industrial enzymes, industrial oils, biofuels, fibers, papers, agents for bioremediation, phytoremediation.

Unit – 4 Molecular biology (12 hrs)

Cloning vectors and Transgenics. Genetic improvement of medicinal plants through Biotechnology and Genetic engineering. Molecular diversity analysis using various types of markers. Applications of molecular techniques in herbal research. Applications of *in-vitro* culture methods in drug production. Growing and harvesting genetically engineered crops to produce compounds of industrial importance.

Unit – 5 Advances in Plant Medicines (12 hrs)

Plants as bioreactors, molecular pharming - production of pharmaceutically valuable compounds from plants. Plant made pharmaceuticals (PMP). Plantibodies Edible Vaccines / Plantigens, Interferon's, Blood clotting factors, Anticoagulant, Hormones, Enzymes, Secondary metabolites, other proteins. IPR and medicinal plants.

References

- 1) Melchias, G. 2001. Biodiversity and Conservation. Science Publishers, NH USA
- 2) Krishnamurthy K.V. 2004. Advanced Textbook on Biodiversity: Principles and Practice. Oxford & IBH, New Delhi.
- 3) The World Conservation Strategy. IUCN, Switzerland.
- 4) Heywood, VH (Ed.). 1995. Global Biodiversity Assessment Report .UNEP.
- 5) Bidwell. R. G. S. 1979 Plant Physiology. Macmillon Delhi.
- 6) Lea, P. J. and R. C. Leegood. 1993. Plant Biochemistry and Molecular Biology, JohnWiley & Sons. New York.
- 7) Hans-walter heldt. 1997. Plant biochemistry and molecular biology. Oxford university press, New York. USA.
- 8) Jogdand. S.N.1997. Environmental Biotechnology – Industrial Pollution Management. Himalaya Publishing House.
- 9) Watson, J.D. and W.A. Benjamin. 2004. 3rd Edition. Molecular Biology of the Genes. Benjamin Cummings.
- 10) Freifelder, D. 1983. Molecular Biology. 2nd Ed. Narosa publishing house.
- 11) Lodish, H., Berk, A., Zipursky, S.L., Matsudaira, P., Baltimore, D. and Darnell, J. 2000. Molecular Cell Biology, W.H. Freeman and Co., New York, USA.
- 12) Wolfer, S.L. 1993 Molecular and Cellular Biology, Wadsworth Publishing, USA.
- 13) Revised guidelines for research in Transgenic plants (August 1998), Department of Biotechnology, Ministry of Science & Technology, Government of India, New Delhi.

PLANT CONSERVATION BIOTECHNOLOGY

L	C
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OBJECTIVES

- To study the essentiality of conservation of rare plants and their conservation status by IUCN
- To enhance the understanding on conservation and linking biotechnological tools in conservation programs
- To learn the recent theoretical and practical approaches towards conservation of germplasm

Unit –1 Conservation (12 hrs)

Introduction - Need for inventorying and documentation. Principles of conservation; extinctions; environmental distribution status of plants based on international union for conservation of nature (IUCN). Red data list of Indian plants.

Unit – 2 Plant conservation Biotechnology (12 hrs)

Integration of biotechnology into conservation practices. Molecular approaches to assessing plant diversity. Biotechnology in plant germplasm acquisition. Methods of Plant conservation, and sustainable utilization of plant genetic resources.

Unit – 3 Tissue culture techniques (12 hrs)

In vitro Plant Conservation: Culture room and lab facilities. Media composition and preparation – plant growth regulators, adjuvants; sterilization. Morphogenetic patterns. Callus culture - Subculture, differentiation, and regeneration. Organogenesis : Embryoids, Caulogenesis, Rhizogenesis, Cell Line, Somaclone, Gametoclone.

Unit – 4 Micro propagation (12 hrs)

Preparative stage: Germplasm acquisition and selection of explants. Establishment stage: Axenic and viable cultures. Multiplication stage. Plantlet production: induction of roots and acclimatization of plantlets to green house condition. Somatic embryogenesis. Synthetic seed technology. Suspension culture, in vitro production of secondary metabolites, cell immobilization.

Unit – 5 Cryopreservation and Germplasm storage (12 hrs)

Slow or retarded growth. Principles, Cryoprotection, Freezing and long term cryogenic storage, protocols and recovery of germplasm. Conservation of Rare, endemic, threatened and economically important plants of India, current status and Active research stations in India. Stability assessments of conserved plant germplasm.

References

1. Dodds.I.H, and Roberts. L.W, 1995, Experiments in plant tissue culture. Cambridge University press, London.
2. Erica Benson. 1999, Plant conservation Biotechnology. Taylor and Francis Ltd., UK.
3. Dixon.R.A, 1994, Plant cell culture, A Practical approach.IRL press.Oxford, London.
4. Freifelder.D.1990.Molecular Biology.Narosa publishing house, New Delhi.
5. Murray Moo – Young. Plant biotechnology, comprehensive biotechnology series, pergamon press, Netherlands.
6. Narayanasamy.S, 1994, Plant cell and tissue culture. Tata McGraw – Hill Publishing co., Delhi.
7. Yeomen, 1987, Plant cell culture technology. Narosa Publication. New Delhi.
8. Lindsay, 1992, Plant Tissue Culture manual, Kluver Academic Publishers. Netherland.
9. George. E. F, 1994, Plant Propagation by Tissue culture. Exegetics Ltd., England.
10. Vasil.I.L, and Vasil.V.K, 1992, Plant Biotechnology and tissue culture. Kluver Academic Publishers, Netherlands.
11. Raven, Johnson, Losos, Mason and Singer 2008. BIOLOGY. 8th edition. McGraw Hill. New York, New Delhi.
12. Russell, Wolfe, Hertz and Starr 2008. Biology – THE DYNAMIC SCIENCE. Thomson Brooks/Cole, Australia, United States.

DEVELOPMENTAL BOTANY

L	C
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UNIT I -MERISTEMS

Organization of Meristem – Stem (monocot & dicot) – root (monocot & dicot) cambium and secondary growth in dicots, anomalous secondary growth, Secondary thickening meristem in monocots. Microtechnique – anatomical fingerprinting. Histochemical localization of starch, proteins, oil and phenols.

13 HRS

UNIT II – PLANT HORMONES

– Growth hormones and their role in development and resource mobilisation : Auxin, Cytokinin and Gibberellins- Functions and genetic molecular mechanism.

8 HRS

UNIT III – DIFFERENTIATION AND MORPHOGENESIS

Cellular mechanisms of Development – overview of development- cell differentiation – pattern formation – morphogenesis – environmental effects on development. Growth and development through tissue culture – cell, tissue, organ culture – regeneration through somatic embryogenesis.

14 HRS

UNIT IV – WATER AND FOOD MOVEMENT

Mobilization of food reserve – Pathway of upward movement of water and mineral ions – Mechanism of upward Movement in the xylem – Pathway of Movement of Organic Assimilates – Mechanisms of movement in Phloem. Cell wall architecture Mobilization of cell wall reserves (NSPs) in grasses.

12 HRS

UNIT V – GENETIC CONTROL IN DEVELOPMENT

Gene expression with reference to plant development- Auxin response genes: Aux/IAAs, sUAR and GH3. Reactive Oxygen Species (ROS)- Nuclear gene expression: regulation by light. Differential gene expression in fruits and seeds.

13 HRS

References

1. Raven, Johnson, Losos, Mason and Singer 2008. Biology. 8th edition. McGraw Hill. New York, New Delhi.
2. Russell, Wolfe, Hertz and Starr 2008. Biology – THE DYNAMIC SCIENCE. Thomson Brooks/Cole, Australia, United States.
3. Curtis (1935). The Translocation of Solutes in Plants. McGraw – Hill, New York.
4. Salisbury, Ross 1991. Plant Physiology. 4th edition. Brooks/Cole.

5. Richardson 1968. Translocation in Plants. The English Language Book Society and Edward Arnold (Publisher) Ltd.
6. Rudall 2006. Anatomy of Flowering Plants – An Introduction to Structure and Development. Cambridge University Press.
7. Mauseth 1988. Plant Anatomy. The Benjamin/ Cummings Publishing company, Inc. California.
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9. Lodish, Berk, Matsudaira, Kaiser, Krieger, Scott, Zipursky, Darnell. Molecular Cell Biology 5th edition.
10. Nicholl 2008 – An Introduction to Genetic Engineering 3rd edition. Cambridge University Press.
11. Primrose and Twyman 2006. Principles of Gene Manipulation and Genomics 7th edition. Blackwell.

PHYTOCHEMISTRY AND PHARMACOGNOSY

L	C
60	4

Objectives

- To have an understanding on the need for phytochemical studies which help to know the diversity of chemical compounds present in the plants.
- To learn the methods used in the extraction of the diverse compounds and their economic importance.
- To understand the need for pharmacological studies that help in the formulation of drugs for the benefit of humankind.
- To know the various analytical methods approved by WHO to standardize crude drugs.

UNIT- I Phytochemistry:

Scope, importance in pharmaceuticals industry, preparation of plant extracts - digestion, decoction, percolation, hot continuous extraction, aqueous alcoholic extraction, superficial fluid extraction and counter-current extraction. **(12 hrs)**

UNIT - II Secondary metabolites:

Definition, classification, natural sources and therapeutic applications of flavonoids: Flavones, Flavanones, Flavonols, Anthocyanins. Alkaloids: Ephedrine, Serpentine and Morphine. Volatile oils - source, constituents, extraction and uses. **(12 hrs)**

UNIT- III Glycosides:

Definition, properties, classification, natural sources, pharmacological and toxicological effects of glycosides. Terpenoids: β -Sitosterol, Glycyrrhizin. Phenolics: Coumarins and Tannins.

(12 hrs)

UNIT-IV Pharmacognosy:

Definition, scope, Classification of drugs - morphological, taxonomical, pharmacological and chemical. Collection and processing of crude drugs - antichemical, phytochemical, antimicrobial and chemical. Preparation of plant extracts - maceration, infusion, decoction, percolation, sonication, hot continuous extraction, superficial fluid extraction and counter-current extraction.

(12 hrs)

UNIT -V

Screening and WHO Standardization of crude drugs (WHO guidelines): Physicochemical (Ash and Extraction values), fluorescence analysis, qualitative and quantitative analysis, basic chromatographic and spectroscopic analysis of crude drugs. **(12 hrs)**

References

1. Agarwal, S.S and M. Paridhavi. 2007 Crude Drug Technology. Universities Press, Hyderabad
2. Anonymous, 1948-1976. The Wealth of India 11 Vols.
3. Bhattacharjee, S. K. 2004. Handbook on medicinal plants, Pointer publishers. Jaipur
4. Evans, W.C. 1997. Pharmacognosy. Harcourt Brace & Co., Asios Pvt., Ltd.
5. Farooqi, A.A and Sreeramu, B.S. 2001 Cultivation of Medicinal and Aromatic Crops, Universities press.
6. Gurdeep Chatwal 1983. Organic Chemistry of Natural Products. Himalaya Publishing house, Mumbai.
7. Joshi, S.G 2000. Medicinal plants, Oxford and IBH Company Private Ltd. New Delhi.
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BIOFERTILIZER AND PLANT RESPONSES

L	C
60	4

Objectives

- To enhance the understanding of the nutrient management and plant nutrient requirements
- To impart knowledge on the importance and mechanisms of the biological nutrient enhancement and availability to the plants.
- To reveal the application of potential biofertilizer agents currently used

Unit 1: Integrated Plant Nutrient Management (12 hours.)

Biofertilizers - classification, potential to improve crop production, chemically fixed Nitrogen versus biologically fixed nitrogen, and synergistic interaction between biofertilizing agents. Biofertilizing agents and plant disease control. Brief account of beneficial microorganisms – *Rhizobium*, *Azospirillum*, *Azotobacter* and mycorrhiza.

Unit 2: Nitrogen Fixation (12 hours.)

Historical review, biochemistry and regulation of biological nitrogen fixation, factors affecting nitrogen fixation, key organism fixing nitrogen - *Rhizobium*, *Azospirillum* and *Frankia*

Unit 3: Phosphate Solubilizing Microorganisms (12 hours.)

Phosphate fixation and solubilization in different soils. Factors affecting phosphate solubilization - mechanisms of action and role of acids. Biological phosphorus solubilization and effect on crop yield. key P-fixing fungal and bacteria with special emphasis on mycorrhiza.

Unit 4: Biofertilizer Application and Evaluation Techniques (12 hours.)

Different methods of biofertilizer inoculation - seed inoculation, top dressing of biofertilizers, granular biofertilizers, frequency of inoculation, liquid inoculation of biofertilizers, culture pellet, and methods of application of other biofertilizers. Preparation and use of inoculant - *Azotobacter*, *Azospirillum*, mycorrhizae, and *Rhizobium*. Role of humus in influencing the biofertilizer inoculation.

Unit 5: Crop Response to Biofertilizers (12 hours.)

Influence of symbiotic nitrogen fixation, *Azotobacter*, *Azospirillum*, and mycorrhizae in irrigated and dry crops and fodder crops. Factors affecting crop response to biofertilizers, interaction effect of microbial strains, effect of nutrient interactions, interaction of inoculants with other nutrients, multi-microbial inoculation and compatibility between biofertilizers and chemical fertilizers.

REFERENCES

1. Rai, M.K. (2006). Handbook of Microbial Biofertilizers, the Haworth Press, Inc
2. Kannaiyan, S. 2002. Biotechnology of Biofertilizers. Springer Netherlands, p.376.
3. Dubey, R.C. and Maheshwari, D.K. 2013. A Textbook of Microbiology (Revised edition). S. Chand & Company Ltd., New Delhi
4. Relevant Journal papers & Reviews

SOIL FERTILITY AND PLANT NUTRITION

L	C
60	4

Objectives

- To introduce the student with the problems of soil plant nutrient availability and the ways to manage and improve the productivity.
- To impart knowledge on the essentiality of the key elements of plant nutrition and the ways to enhance their availability in soil.
- To introduce the biological method of enhancing the nutrient availability and plant uptake

Unit 1: Soil as a medium for plant growth (12 hours.)

Abiotic and biotic elements of soils, formation of soil, classification and soil profiling. Characteristics and impact of acidic, saline, and alkaline soils on crop productivity. Importance of C: N ratio and pH in plant nutrition.

Unit 2: Soil fertility and productivity (12 hours.)

Soil properties on nutrient availability, definition of soil fertility in terms of productivity, soil types in wild and agrarian systems, soil patterns and agricultural regimes in Tamilnadu. Factors affecting soil fertility. Essential plant nutrients- NPK other major and minor nutrients, chelates. Classification of nutrients based on utilization and metabolic functions in plants. Criteria of essentiality of elements.

Unit 3: Plant Essential Nutrients (12 hours.)

Essential plant major and minor nutrient elements - functions, deficiency systems, biogeochemical cycles, transformations and availability. Effective consumption of nutrients, plant-microbe interface interactions in soils, positive and negative plant to plant interactions, changes in water table and its consequences.

Unit 4: Influence of microbes on plant nutrition (12 hours.)

Role of microorganisms in organic matter decomposition, and humus formation. Nitrogen fixation and cycling, phosphorus mobilization, calcium and potassium uptake and transport. Key microorganisms of nitrogen and phosphorus turnover in soil.

Unit 5: Fertilizer application (12 hours.)

Use of fertilizers, manures, mulch and bio supplements, concept of organic farming, and significance of green manure. Agricultural applications and dispensation of fertilizers- Methods of fertilizer application- solid and liquid forms of fertilizer application and their merits and demerits. Comparison of chemical and biological fertilizers on the basis of definition, application and crop protection potential. Analytical methods for soil nutrients.

REFERENCES

1. Western Fertilizer Handbook (9th edition). 2002. California Plant Health Association, Sacramento, Ca.
2. Brady, N.C. and R.R. Weil. 2005. The Nature and Properties of Soils (14th Ed.) Prentice-Hall, Inc.
3. Rai, M.K. (2006). Handbook of Microbial Bio fertilizers, the Haworth Press, Inc.
4. Benton Jones, Jr. J. 2012. Plant Nutrition and Soil Fertility Manual (Second Edition) CRC Press.
5. Journal review and research articles.

ECOLOGY, BIODIVERSITY AND SUSTAINABILITY

L	C
60	4

Objectives

- To gain knowledge on the biogeography, ecosystem diversity and biodiversity hotspots of India.
- To understand the concepts of vegetation analysis
- To understand the reasons for the loss of habitats/biodiversity and learn to find solutions to minimize degradation.
- To understand the need for the sustenance of habitats including man-made ones and conserve them for the benefit of humankind.
- To be aware of the existing social issues and the laws enforced to tackle the issues.

UNIT - I Biodiversity:

(12 hrs)

Introduction, definition, genetic and species diversity. Ecosystem diversity - Aquatic: ponds, lakes, streams, rivers, estuaries, oceans, desert ecosystem, grassland ecosystem, forest ecosystem, insular species diversity.

UNIT - II Biodiversity of India

(12 hrs)

India as a Megabiodiversity nation, Biogeographical classification of India, Biodiversity hotspots of India, Eastern Himalaya, Western Ghats, Eastern Ghats, Deccan Plateau, Gulf of Mannar, Andaman and Nicobar Islands. **Threats to biodiversity:** Habitat loss - Causes, effects and solutions; Poaching of wildlife - Causes, effects and solutions; Man-wildlife conflicts - Causes, effects and solutions; Endangered and endemic species of Peninsular India.

Unit-III: Vegetation Organisation and Diversity Analysis (12 hours)

Concepts of species, population and community; analysis of communities; community coefficients, inter specific associations, and concept of ecological niche; temporal and seasonal changes; island biogeography, and mangroves.

Ecophysiology and Diversity Analysis - Conceptual introduction; plant functional traits; phenological studies and their importance; analysis of density, species richness and diversity of plants; diversity indices; ecological genetics.

UNIT-IV Food and Agricultural resources and their conservation: (12 hrs)

Centres of origin of cultivated plants, Wild relatives of cultivated plants, Agriculture and food production, Agriculture and ecosystem degradation, Impacts of modern agriculture on environment - effects of fertilizers, pesticides, water logging and salinity, Sustainable

agriculture and food production. Role of FAO.

UNIT – V Social issues and the environment:

(12 hrs)

From unsustainable to sustainable development, Environmental ethics: issues and possible solutions, Consumerism and waste products, Environment Protection Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public awareness. KYOTO protocols.

References

1. Annamalai, R. 2004. *Tamil Nadu Biodiversity Strategy and Action plan. Wild Plant Diversity*. Government of Tamil Nadu, Chennai.
2. Chapman, J.L. and Reiss, M.J. 1995. *Ecology: Principles and Applications*. Cambridge University Press, Cambridge.
3. Chhatwal, G.R. 1998. *Encyclopaedia of Environmental Biology*. Anmol Publications Pvt., Ltd. New Delhi.
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5. Dash, M.C. 2001. *Fundamentals of Ecology*, 2nd Edition. Tata McGraw Hill Publishing Company, New Delhi.
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7. Groom Bridge, B. 1995. *Global Biodiversity*. Chapman & Hall, London.
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9. Kumaresan, V. and Arumugam, N. 2015. *Plant Ecology and Phytogeography*. Saras Pub., Nagercoil.
10. Odum, E.P. & Barrett, G.W. 2005. *Fundamentals of Ecology*, 5th Edition, Affiliated East West Press Pvt. Ltd., New Delhi.
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TAXONOMY OF ANGIOSPERMS

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Objectives

- To improve the understanding of the taxonomy of angiosperms and its need
- To instill the significance of angiosperm taxonomy and its importance in conservation
- To prepare the students to become a researcher in angiosperm taxonomy

Unit I: Origin and evolution of Angiosperms (10 hours)

Ascent of angiosperms in geological time scale, major sites of origin. Theories with respect to time, place possible ancestors

Unit II: Plant nomenclature (13 hours)

Binomial Nomenclature, ICBN to IUCN; Methods of Botanical name(Latin)-Plant identification: Herbarium taxonomy, Botanical gardens, Taxonomic literature, Indented and Bracketed keys; Taxonomic hierarchy - Major categories, minor categories, species concept; Taxonomic evidences - Morphology, Anatomy, Palynology, Embryology, Cytology, Photochemistry, Genome analysis and Nucleic acid hybridization.

Unit III: Plant systematics and classification (13 hours)

Pre Darwinian Classification Based on form relationship (Bentham and Hooker); Post Darwinian classification Engler and Prantl, Bessey's, Hutchinson, Takhtajan and Cronquist; Recent modifications : Dahlgren's system of classification; Biosystematics Concept, aims and objectives, categories, methods in biosystematics, Ecotypic variations, scope and limitations, comparison of classical taxonomy and biosystematics; Angiosperm Phylogeny Group IV.

Unit IV: Numerical Taxonomy (12 hours)

Phenetic methods in taxonomy (taxometrics), principles, construction of taxonomic groups, OUTs, unit character, measurement of resemblances, cluster analysis, phenons and ranks, discrimination, nomenclature and numerical taxonomy, applications, merits and demerits, cladistics and cladogram, parsimony analysis, cladistics and classification

Unit V: Chemotaxonomy (12 hours)

Significance of chemotaxonomy, classes of compounds and their biological significance, uses of chemical criteria in plant taxonomy, protein and taxonomy, seed proteins, serology and taxonomy, application of serological data in systematic.

REFERENCES

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PLANT ANATOMY AND REPRODUCTIVE BIOLOGY

L	C
60	4

Objectives:

1. Understand the types of tissues and their organization.
2. Compare the tissue components of vegetative and reproductive parts of a plant.
3. Principles of histochemistry and methods of localization of important chemical constituents.

Unit I Meristems

Types: Apical, lateral and intercalary. Tissue system: simple and permanent tissues. Complex tissues- xylem and phloem. vascular cambium origin, structure and development, seasonal activity of cambium, factors affecting cambial activity. **(12 hrs)**

Unit II stem anatomy:

Structure of a typical young dicot stem, normal secondary growth in a dicot stem. Leaf anatomy : structure and ontogeny of a dicot leaf, petiole anatomy. Anatomy of reproductive structure flower bud and mature flower. Nodal anatomy – Uni, tri and multilacunar node. **(13 hrs)**

Unit III Reproductive Biology

Floral structure, Pollination types – anemophily, hydrophily entemophily, ornithophily and chaerapterophily. Pollen pistil interaction and significance of the structure of style and stigma. **(10 hrs)**

Unit IV External secretory structures

Trichomes and glands, Nectaries, Hydathodes Internal secretory structures : secretory cells, secretory cavities and canals, laticifers. **(10 hrs)**

Unit V Histochemistry

Histochemical localization of cellular components - starch, Proteins Nucleic acids and lipids. Phytochemistry - basic concepts. Qualitative tests for alkaloids flavonoids, saponins, tannins, terpenoids and glycosides. **(15 hrs)**

References:

1. Eames A. J. and Mac Daniels L. H., 1990. An introduction to Plant Anatomy Tata McGraw Hill Publishing Company, Bombay-New Delhi. (Unit I & II).
2. Foster and Gifford .1967. Comparative morphology of vascular plants. Second edition. Valkis Feffer and Simons pvt. Ltd. Bombay.
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8. Maheshwari, P.1971. An Introduction to the Embryology of Angiosperms McGraw Hill Book Company, Inc., London.
9. Shivanna, R. Jobri. B.M. and Sastri. D.C. 1985. Development and physiology Angiosperm pollen. Wiley Eastern Ltd., New Delhi. (Unit IV & V).
10. Krishnamurthy, K.V. 1988. Methods in Plant Histochemistry. Viswanathan Printers Publishers Ltd., Chennai.

ALGAL TECHNOLOGY

L	C
60	4

Objectives:

- **To understand the concept and life cycle of algae.**
- **To learn the methods and approach towards the eco friendly aspects.**
- **To gain an insight on the various advancement in algal technology**

Unit:I - General account (12 Hrs)

Introduction: General account- Distribution, resources of algae. Classification of Algae (Fritsch,1935 &1945;Chapman and Chapman,1973;and Sybil and Parker,1981).Taxonomic Key for identification of economically important algae – Intended & Bracketed keys. Identification of algae in the field. Research centres of algae-Indian algalogists and their contribution: F.Boergeson. M.O.P Iyengar (1886-1963), M.S.Randhawa (1932-1959). and T.V.Desikachary (1919-2005) Role of Centre for Seaweed Herbarium & Marine Algal Research Station (MARS).

Unit: II- Structure and Reproduction of Algae (12 Hrs)

Structure and reproduction.- Range of Thallus structure , Patterns of reproduction and life cycle. Cell structure and organelles: Fine structure and functions. Chemical composition of marine algae-Macro & Micromolecules. Economic Importance of Algae.

Unit-III- Common Algal Pigments (12 Hrs)

Introduction- Common Algal Pigments : Structure and properties of some important algal pigments -Phycocerythrin, Phycocyanin, Beta-carotene, Chlorophyll and Fucoxanthin. Extraction of Algal Pigments and Role of Algal Pigments- Dyes and Colorants from Algae: Textile dyeing- Chlorophyll (*Caulerpa taxifolia.*) and Pharmaceutical dyeing- anthocyanin(*Spirulina sp.*) .

Unit-IV- Extraction, Processing and uses of Nutraceuticals (12 Hrs)

Phycocolloids: Agar-agar (*Gelidiella sp.* & *Gracilaria sp.*), Carageenan (*Hypnea sp.* & *Eucheuma sp.*), Algin (*Sargassum sp.* & *Padina sp.*.) Omega-3 polyunsaturated fatty acids (*Nannochloropsis*). Nutraceutical tablets & tonic from *Spirulina sp.* and β -Carotene (*Dunaliella sp.*).

Unit-V- Commercial products from algae: (12 Hrs)

Preparation and applications of the Following: Salad & Soup (*Ulva*, *Caulerpa*) Jelly, Candy, Gelatin, Food thickeners, Sushi, (*Gracilaria sp.*) Tooth paste (Carageenan- *Euchuma sp.*). Seaweed Liquid Fertilizer (*Sargassum sp.*), Biomedicine: Caulerpin, Caulerpicin (*Caulerpa sp.*) and Heparin (*Grateloupia sp.*)

Text Books :

1. Ashutosh Kar (2010) . Chemistry of Natural Products, Vol. 1 CBS Publishers and Distributors Pvt Ltd, e-book.
2. Boergeson,F.(1938). Contributions to the South Indian marine algal flora.III. J. Indian Bot.Soc.17:205 -242.
3. CMFRI Bulletin:40., (1998). Seweed culture, Processing and utilization, Tatapuram, Cochin.
4. Fritsch, F.E. (1935) The Structure and Reproduction of the Algae ; Volume 1, First Edition . Cambridge University Press
5. Fritsch F. E. (1952) The Structure and Reproduction of the Algae ; Volume 2, First Edition. Cambridge University Press.
6. Ganguly, H.C., Kar,A. K.,and S.C.Chandra (2013) College Botany, Vol-I, New Central Book Agency PVT.London.
7. Khattar, J.I.S., Singh, D.P., Kaur, (2009) Algal Biology and Biotechnology, - Microalgae: A source of natural colours, Edition: 1, I. K. International Publishing House Pvt. Ltd. New Delhi,
8. Laura Barsanti, Paolo Gualtieri. 2014 Algae: Anatomy, Biochemistry, and Biotechnology, Second Edition. CRC Press.London.
9. Leela, S.S and Jyothi Kumar,2010. Algal BioProcess Techology, 1st Edition, New age International Publishing house, New Delhi.
10. NIIR Board of Consultants & Engineers.. ISBN: 8178330326.Code: NI160. Pages: 448. Published: 2005. The Complete book on Natural Dyes & Pigments. Publisher: Asia Pacific Business Press Inc. e-book..
11. Pandey B.P., (2000). Revised edition, *Text Book of Botany Algae*, S.Chand &. Company, New Delhi .
12. Vashista. P.C. (1996). Text book of Algae, S.Chand Publishers, Meerut.
13. Venkatataman, G.S.91962). Algal Biofertilizer and Rice cultivation, 8th Edition, Today and Tomorrow Publishers, New Delhi.

BRYOPHYTE SYSTEMATICS AND EVOLUTION

L	C
60	4

Objectives

- To gain knowledge on the origin, evolution and distribution of bryophytes including fossil evidences globally.
- To have a knowledge on habitat preferences, diversity of bryophytes and factors influencing their growth.
- To have a brief knowledge on the morphology, anatomy and life-cycle of bryophytes.
- To be aware of the factors responsible for their loss and find measures to minimize them.

UNIT - I

Origin and evolution: Origin and distribution, Fossil bryophytes, Evolution of gametophytes, Evolution of sporophytes, Primitive and advanced features of bryophytes. **(12 hrs)**

UNIT-II

Diversity: Classification of bryophytes, Diversity, Habitat diversity, Factors influencing the growth of bryophytes, Ecological adaptations. **(12 hrs)**

UNIT-III

Mosses: A comparative study of the morphological and anatomical features of Sphagnales, Polytrichales, Fissidentales, Syrrhopodontales, Funariales, Eubryales, Hookeriales and Hypnobryales. **(12 hrs)**

UNIT-IV

Liverworts: Calobryales, Sphaerocarpaceae, Marchantiales, Metzgeriales Jungermanniales and Anthocerotales. Economic importance of bryophytes. **(12 hrs)**

UNIT-V

Special features: Life-cycle of bryophytes, types of sporogonia/elaters, gemmae/receptacles, calyptrae and operculum and peristome teeth. **(12 hrs)**

References

1. Cavers, F. 1981. The Interrelationships of the Bryophyta. Indian report S.N. Technico (Book House), Patna.
2. Chopra, R.N. & Kumar, P.K. 1988. Biology of Bryophytes. Wiley Eastern Ltd., New Delhi.
3. Daniels, A.E.D. & Daniel, P. 2013. The Bryoflora of the Southernmost Western Ghats,

- India. Bishen Singh Mahendra Pal Singh, Dehra Dun.
4. Puri, P. 1981. Bryophytes. Atma Ram & Sons, New Delhi.
 5. Watson, E.V. 1980. British Mosses and Liverworts. Cambridge.

ACWBY13- ETHNOMEDICINE

L	C
60	4

- To have an insight into the various Indian Systems of medicine.
- To have a knowledge on the plants used in these systems.
- To understand the ethical values of plants involved in these systems.
- To develop methods of conservation of medicinal plants.

Unit-1 Ethnomedicine(12 hrs)

Definition, role of tribal communities in Ethnomedicine. Historical account of medicinal plants in India. Classification of medicinal plants on the basis of morphological structure viz. leaf, root, stem, rhizome, flower, fruits and seeds. Religious values of plants, faith and mythology, folk songs, plants used in rituals, tribals and medicinal plants, Holy plants in ethno medicine.

Unit-2 Distribution and Status(12 hrs)

Medicinal plants in general, distribution in Western Ghats and Eastern Ghats. Medicinal plants of Tamil Nadu: Endemic, rare and endangered species of medicinal plants.

Unit-3 Conservation(12 hrs)

Collection and conservation of medicinal plants. Sacred groves, Herbal farms, Nurseries, Medicinal gardens, Plants in Temples, Churches and Mosques. A general account of active principles found in the medicinal plants of *Aegle*, *Coriandrum*, *Cuminum*, *Piper*, *Brassica*, *Catharanthus*, *Artemisia*, *Coleus*, *Trichopus*, *Wrightia*, *Azadirachta* and *Taxus*.

Unit-4 Systems of Medicine(12 hrs)

History of Ayurvedic medicine, Ranges of Ayurveda, Significance and plants used in Ayurveda. Principles of Unani medicine, diagnosis and mode of treatment, Unani approach to common ailments. Difference between Ayurvedic and Unani medicines, safety measures in Unani medicines and plants used in Unani system.

Unit-5 Herbal remedies for Gynaecological morbidity, plants in the treatment of diabetes, herbal remedies for liver diseases, Plants in the treatment of skin diseases, antivenomic and antitoxic plants. **(12 hrs)**

Reference Books

1. Gurdeep Chatwal, 1983. Organic chemistry of Natural Products, Himalaya Publishing House, Mumbai.
2. Jean Bruneton, 1999. Pharmacognosy, Second Edition, Lavoisier Publishers, Inc. USA.
3. Kokate, C.K., Purohit, A.P and Gokhale, S.R. 2004. Pharmacognosy, Nirali Prakashan

Publications, Pune.

4. Nitin Suri, 2010. Phytochemical Techniques, Oxford Book Company.
5. Roseline, A. 2011. Pharmacognosy, MJP Publishers, Chennai.
6. Runit M Shah and Rupesh T Nayak, 2012. Pharmacognosy, Global Academic Publishers, New Delhi. (Part I and Part II).
7. Wallis, T.E. 1985. Text Book of Pharmacognosy, CSB Publishers, New Delhi.
8. William Charles Evans, 2002. Pharmacognosy, Fifteenth edition, Harcourt Brase & Company, Asia Pvt. Ltd.
9. Anonymous, 1987. The Wealth of India, (vol. 1-11). CSIR, Directorate Publications, New Delhi.
10. Bhattacharjee, S.K. 2004. Handbook on medicinal plants, Pointer Publishers. Jaipur.
11. Sharma P. and C. Etal, 2000. Database on medicinal plants used in Ayurveda, Ministry of Health and Family Welfare.
12. Yogaarasimhan S.N. 2000. Medicinal plants of India, Vol 2. Tamil Nadu., Inderline Publishing Private Ltd. Bangalore, Dehra Dun and Michigan.
13. Joshi, S.J. 2000. Medicinal Plants. Oxford & IBH company Pvt. Ltd., New Delhi.
14. Michael, A.M. Handbook of Medicinal plants. Pointer Pub., Jaipur.
15. Warriar, P.K., Nambiar, V.P.K & Ramamurthy, C. 1996. Indian Medicinal plants. Vols. 1 - 5. Orient Longman Ltd., Hyderabad.

ACWBY14 - MARINE BOTANY

L	C
60	4

OUTCOMES

- Students will be introduced to marine and estuarine environments
- Students will become familiar with the major micro- and macro- algal groups and marine vascular plants.
- Students will appreciate the roles played by algae, seagrasses and aquatic vascular plants in aquatic ecosystems.
- Students will become aware of how natural events and human activities affect coastal habitats

UNIT: I

(12 hrs)

Marine plant groups and Organisms – Brief account on Marine Phytoplankton – Seaweeds, Seagrasses and Mangroves – Corals and coral reefs. Mangroves – adaptations of marine plants.

UNIT: II

(12 hrs)

Marine Ecology – Physical, chemical and biological characteristics of marine water. Zonations in the oceans (Horizontal and vertical) - Dead zones (Anoxia and Hypoxia) - Tides and their importance.

UNIT: III

(12 hrs)

Photosynthesis of algae (Micro and macro) in sea – Photosynthetic pigments – carbon fixation – Photosynthetic rate – C3 and C4 characters in algae. Photosynthesis of mangroves – carbon fixation – Photosynthetic enzymes – accumulation of free amino acids – photorespiration – Nutrition – Salinity regulation and Metabolism of Seaweeds and Mangroves and their methods of regeneration – Biogeochemical role of algae.

UNIT: IV

(12 hrs)

Seaweed Polysaccharides – Commercial and economical products of Seaweed (Agar, Algin and Carrageenan) and Low molecular weight compounds in algae – Methods of collection and preservation of Marine algae – Commercial cultivation of seaweeds (Traditional and Recent methods) – Application and uses of Seaweeds - Economic importance of seaweeds.

UNIT: V**(12 hrs)**

Seaweed, Sea grasses, Mangroves and Coral reefs research in India and World. Marine Pollution – human Impact - Conservation strategies of Marine vegetation - Use of Remote sensing techniques in mapping of marine vegetation with GIS.

REFERENCES

1. **Jackson, D.F. 1972.** Algae and Men. Plenum Press.
2. **Krishnamurthy, V. 1985.** Marine Plants. Seaweed Research and utilization Association, madras.
3. **Chapman, V.J. 1976.** Coastal Vegetation. Pergamon press. New York.
4. **Daves, C.J. 1985.** Marine Botany Physiology and Ecology of Seaweeds.
5. **Dawson. 1960.** Marine Botany.

VASCULAR CRYPTOGAMS

L	C
60	4

OUTCOME

- An understanding the diversity, life-cycle patterns and major evolutionary trends of Pteridophytes and gymnosperms.
- An understanding of the diversity of pteridophytes and gymnosperms
- An understanding of the evolution of pteridophytes and the fossilization process.

UNIT: I General characters of Pteridophytes (12 hrs)

General life cycle pattern of homosporous and heterosporous pteridophytes. General ecology of Pteridophytes. Contributions of Indian Pteridologists.

UNIT: II Pteridophyte classification (12 hrs)

A R Smith *et al.* General morphological, anatomical and reproductive characters of major classes of pteridophytes.

UNIT: III Evolution (12 hrs)

Cytological evolution in pteridophytes; apogamy and apospory; mechanism of diplospory in apogamous ferns (Dopp and Manton, Braithwaite system).

UNIT: IV Steels (12 hrs)

Stelar types and stelar evolution, sporangial/soral types and sporangial/soral evolution in pteridophytes.

UNIT: V Pteridophytes of India. (12 hrs)

Pteridophytes in India:- Rare and endangered species in Western Ghats, South India. Medicinal pteridophytes; Conservation of pteridophytes in India.

REFERENCES

1. **Sporne, K.R. 1985.** The Morphology of Pteridophytes, Hutchinson & Co, London.
2. **Pandey, B.P. 1978.** Pteridophyta. S. Chand & Company Ltd., New Delhi.
3. **Vashista, P.C. 1997.** Pteridophyta. S. Chand and Company Ltd., New Delhi
4. **Rashid, A. 1990.** An introduction to Pteridophyta. Vikas Publishing House Pvt. Ltd., New Delhi.
5. **Manickam, V. S. & Irudayaraj, V. 1992.** Pteridophyte Flora of the Western Ghats, South India. BI Publications, Pvt. Ltd. New Delhi.

6. **Manickam, V. S. & Irudayaraj, V. 2003.** Pteridophyte Flora of Nilgiris, south India. Bishen Singh & Mahendra Pal Singh. Dehradun, India.
7. **Nayar, B. K. & Kaur, S. 1971.** Gametophytes of homosporous ferns. *The Bot. Rev.* 37: 295-396.
8. **Pullaiah, T. 2003.** Pteridophytes in Andhra Pradesh India. Daya Publishing House, India.
9. **Smith *et al.*, 2006.** A classification of extant pteridophytes. *Taxon* 55(3): 705-731.
10. **Schneider *et al.*, 2016.** A community-derived classification for extant lycophytes and ferns. The Pteridophyte Phylogeny Group. *J. Syst. & Evol.* 54: 563-603.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12
Affiliated colleges and Autonomous colleges

M.Phil. CHEMISTRY PROGRAM FROM THE ACADEMIC YEAR
2018-2019

Preamble

M.Phil is a research oriented program. After completing their Masters in Chemistry or equivalent will opt for pursuing research either directly or after completing the above program. The program is useful for research students to evaluate and identify the research problems which is related to social and economical valuable issues to the society.

Objectives

After studying the M.Phil. program, the students will be able to

- i. Introduce the purpose and importance of research for future development.
- ii. Know the different types of literature search and indexes.
- iii. Understand the error analysis, correlation methods and computer application
- iv. Enrich the knowledge in various types of spectral techniques and scientific analysis.
- v. Develop their skills for carryout the project
- vi. Make awareness in social and industrial relevant issues
- vii. Expose to present their findings in national and international seminars and conferences.

Outcome

After completing the M.Phil program the students will be able to

- i. Pursue research program
- ii. Qualify as Chemist/Scientist in various industries and research institutions

SEMESTER – I

Sl. No.	NAME OF COURSE	COURSE	
		Hrs/ week	Credits
1	Research and Teaching Methodology	4	4
2	Advance Scientific techniques in chemical analysis	4	4
3	Project oriented elective course	4	4

SEMESTER – II

4	Project work, dissertation and Viva- voce	-	12
Total			24

Paper-I

RESEARCH AND TEACHING METHODOLOGY

No. of Hrs – 4 / Week

Credits - 4

Objective

1. *To introduce the purpose and importance of research for future development.*
2. *To know the various indexes and abstracts in science and technology as a source of all information in chemistry.*
3. *To learn the ways of carrying out literature search for current awareness and for the retrospective survey.*
4. *To know the methodology of writing thesis and journal articles.*
5. *To know about the teaching methodology for teaching the scientific concepts and techniques to students*

Unit –I : Scientific Research

(12hrs.)

Introduction to Research, Selection of a research topic, reviewing the literature, preparing the proposal and design of study Experimentation and interpretation of results. Formation, testing and rejection of hypothesis. Preparation and presentation of reports, dissertation and thesis writing.

Unit-II : Chemical Literature

(12hrs.)

Primary and secondary literature: Journals, Patents, Reviews, Chemical abstracts, treatises, monographs and online journals. Web browsing for Research. ASAP alerts, CA Alerts, Scifinder, Chemport, Science direct, STN international, Journal home pages. **Impact factor, citations and h-index. Scopus, Web of Science and Google scholar.**

Unit-III: Error Analysis

(12hrs.)

Limitation of analytical methods, accuracy, precision & minimization of errors – systematic and random errors and reliability of results – Mode – Median – Mean – Standard deviation- Variance & Covariance, normal distribution and the normal probability curve.

Unit-IV: Correlation methods & Non-parametric tests

(12hrs.)

Scatter diagram and linear regression line: Spearman rank order correlation, Pearson's product moment correlation - Correlation co-efficient.

Non-parametric tests - χ^2 test, Median test, Mann-Whitney test, Sign test, Wilcoxon on matched-pairs signed ranks test.

Unit-V: Methodology of Teaching

(12hrs.)

Teaching- Objectives of Teaching, Phases of Teaching – Teaching methods: Lecture Method, Discussion Method, Discovery Learning, Inquiry, Problem Solving Method, Project method, Seminar – Integrating ICT in Teaching: Individualized Instruction, Ways for Effective Presentation with Power Point- Documentation – Evaluation: Formative, Summative & Continuous and comprehensive Evaluation- Later Adolescent Psychology: Meaning, Physical, Cognitive, Emotional, Social and Moral Development – Teaching Later Adolescents

References:

1. Rajammal P. Devadas, A Handbook of Methodology of Research, S.R.K. Vidyalaya Press, Chennai, 1976.
2. J. Anderson, B.H. Durstan and M. Poole, Thesis and assignment writing, Wiley Eastern, New Delhi, 1977.
3. R.O. Butlet, Preparing thesis and other manuscript.
4. R. L. Dominoswki, *Research Methods*, Prentice Hall, 1981.
5. J. W. Best, *Research in Education*, 4th ed. Prentice Hall of India, New Delhi, 1981.
6. H. F. Ebel, C. Bliefert and W.E. Russey, *The Art of Scientific Writing*, VCH, Weinheim, 1988.
7. Joseph, A. *Methodology for Research*; Theological Publications: Bangalore, 1986.
8. Sampath, K., Panneerselvam, A. & Santhanam, S. (1984). Introduction to educational technology. (2nd revised ed.). New Delhi: Sterling Publishers.
9. Sharma, S.R. (2003). Effective classroom teaching modern methods, tools & Techniques. Jaipur: Mangal Deep
10. Vedanayagam, E.G. (1989). Teaching technology for college teachers. New York: Sterling Publishers.

Paper-II

ADVANCED SCIENTIFIC TECHNIQUES IN CHEMICAL ANALYSIS

No. of Hrs – 4 / Week

Credits - 4

Objectives

1. To master the basic principles of spectroscopy to apply for structural elucidation.
2. To learn the methods of characterizing compounds by spectroscopic techniques.
3. To learn the various instrumental methods studying a given compound.
4. To learn the separation techniques for organic and inorganic compounds.
5. To learn about industrial analytical processes.

Unit –I : Absorption Spectroscopy

(12hrs.)

Infrared and Raman Spectroscopy: FT-IR, basic principles, quantitative IR, resonance Raman and laser Raman spectroscopy, applications of IR and Raman spectroscopy to organic and inorganic compounds.

Electronic Spectroscopy: term symbols, spin-orbit coupling in free ions, electronic spectra of O_h and T_d complexes, charge transfer transition, structural evidence from electronic spectra.

Unit II: Applications of Advanced Organic Spectroscopy

(12hrs.)

NMR: Basic principles of two-dimensional NMR spectroscopy – HOMOCSY, HETCOSY and NOESY spectra and their applications – use of INEPT and DEPT methods and their applications.

Mass: Molecular ions, isotope peaks, fragmentation pattern – McLafferty rearrangement - measurement techniques (EI, CI FI, FD, FAB, SIMS, MALDI) – M^{+1} and M^{+2} ions – calculation of molecular formula from P_{M+1} and P_{M+2}

Road-map problems covering UV, IR, $^1\text{H-NMR}$, $^{13}\text{C-NMR}$ and mass spectral data.

Unit-III: Spectroscopy

(12hrs.)

Nuclear Quadruple Resonance Spectroscopy: effect of magnetic field on the spectra, electric field gradient and molecular structure, structural elucidation of inorganic and coordination compounds.

Electron Paramagnetic Resonance Spectroscopy: hyperfine splitting in isotropic systems; epr spectra of systems with more than one unpaired electrons-Kramer's degeneracy, zero field

splitting, epr of triplet states, anisotropy in g -value, anisotropy in hyperfine splitting, nuclear quadrupleinteraction; applications of epr to organic and inorganic compounds.

Mossbauer Spectroscopy: interpretation of isomer shifts, quadruple and magnetic interactions, Mossbauer emission spectroscopy, structural elucidation.

Unit IV: Diffraction & Surface Techniques: (12hrs.)

Principles and applications of XRD, Neutron and electron diffraction – Scanning electron microscopy (SEM)- Instrumentation – applications – surface area analysis, particle size determination – Scanning Probe Microscopes – Scanning Tunneling Microscopes – Atomic force microscopes (AFM) – Principle & applications.

Unit V: Electrochemical Techniques (12hrs.)

Polarography – Chronopotentiometry – Chronoamperometry – chronocontometry- Linear Potential Sweep voltametry – Cyclic Voltametry – ImpendenceMeasurements – AC Voltametry – Principles and their applications.

References:

1. Introduction to Nanoscience- Gabor. L, Hornyak. Joydeep Dutta CRC Press 2008.
2. L. Antropov, Theoretical Electrochemistry, Mir Publication, Moscow, 1972.
3. D.A. Skoog and J.J. Leary, Principles of Instrumental Analysis, 4th Edn., Saunders College Publishing, 1992.
4. D.A. Skoog, F.S.Holler, S.R.Crouch, Principles of Instrumental Analysis, 6th Edn., Thomson Brooks/cole, 2007.
5. A.K. Cheetham, P.Day, Solid State Chemistry: Techniques, Oxford University Press, Oxford, 1987.
6. G. E. Bacon, Neutron diffraction, Oxford Universtiy Press, Oxford, 1975.
7. R.S. Drago, Physical Methods in Chemistry, Saunders, 1999.
8. Spectrometric Identification of Organic Comounds – Silverstein, Bassler and Morrill.
9. Organic Spectroscopy – William Kemp

Paper III - Elective Paper- 1

ADVANCED TOPICS IN ORGANIC CHEMISTRY

No. of Hrs – 4 / Week

Credits - 4

Objectives

1. To learn the various reagents and their application in organic synthesis
2. To study the retro synthetic analysis
3. To understand the concept of linear free-energy relationships
4. To know about the biochemical activities of amino acids and proteins
5. To study on the nucleic acids structure and function

Unit I : Organic Reagents

(12hrs.)

Gilman's reagents – DCC – Grignard reagents – crown ethers – NBS – BF_3 complexes – SeO_2 – 1, 3-dithiane, tri-n-butyl tin hydride – phase transfer catalysts – Wilkinson's catalyst.

Unit II: Retro synthetic Analysis

(12hrs.)

Introduction to disconnections – one group disconnections – two group disconnections – peri cyclic reactions – Heteroatoms and heterocyclic compounds – small rings: three membered, four membered, and five membered.

Unit III: Advances in Linear Free-Energy Relationships

(12hrs.)

An introduction to linear free-energy relationships (LFER) – the Hammett equation – the duality of substituent constants and the Yukawa-Tasumo equation – the general validity of the Hammett equation – deviations from the Hammett equation in its various forms; the separation of polar, steric and resonance effects – Taft's equations; the ortho-effect; application of LFER to organic reactions; Influence of solvent on organic reactivity; the reactivity-selectivity principle.

UNIT IV: Amino Acids and Proteins

(12hrs.)

Structure and Classification – abbreviated names (1 letter and 3 letter) – Physical properties of amino acids – chemical properties – codons – Structure and importance of simple peptides like glutathione, Carnosine, anserine, vasopressin – Peptide antibiotics – gramicidin,

bacitracine, actinomycin D - Peptide synthesis – Acid chloride method – DCC method – Determination of primary structure of peptide – Identification of N-terminal amino acid – Barger's method – the DNP method – identification of C-terminal amino acid – Hierarchical representation of protein Primary, Secondary, tertiary and quaternary structures – Ramachandran plot.

UNIT V: Purine, Pyrimidine and Nucleic Acids

(12hrs.)

Structure of Purines, Pyrimidines – Nucleoside – ribonucleoside, deoxyribonucleosides – nucleotides – ribonucleotides – deoxyribonucleotides – structure and functions of DNA - Watson and Crick model of DNA- Structure of types of RNA (m-RNA, t-RNA and r-RNA) – Nucleases – structure and function of DNA and RNA – polynucleotide – cyclic nucleotide – structure and function of cAMP, cGMP nucleoprotein – Types of DNA (A-DNA, B-DNA, Z-DNA)

References:

1. Reaction Mechanism and Reagents in Organic Chemistry – Gurdeep R. Chatwal
2. Designing Organic Synthesis: A Programmed Introduction to the Synthon Approach – Stuart Warren
3. N.B. Chapman and J. Shorter, Eds., Advances in Linear Free-Energy Relationships, Plenum Press, London, 1972.
4. J. Shorter, Correlation Analysis in Organic Chemistry – An Introduction to Linear Free-Energy Relationships, Clarendon Press, Oxford, 1973.
5. N.B. Chapman and J. Shorter, Eds., Correlation Analysis in Chemistry-Recent Advances, Plenum Press, New York, 1978.
6. J. Shorter, Correlation Analysis of Organic Reactivity, Research Studies Press, England, 1982.
7. Biochemistry, Lehinger J.CB S.Publishers,1993.
8. Biochemistry, U. Satyanarayana & U. Chakrapani, Books & Allied Pvt. Ltd, 1999.
9. Biochemistry — Lubert Stryer – W. H. Freeman and company, 4th Edn., New York, 1995.

CHROMATOGRAPHY

No. of Hrs – 4 / Week

Credits - 4

Objectives

- 1. To understand the chromatographic basic principles*
- 2. To learn the thinlayer chromatographic techniques*
- 3. To understand about the ion exchange concepts*
- 4. To learn about the high performance liquid chromatography for organic analysis*
- 5. To study about the gas chromatography technique for volatile and gas molecule analysis*

UNIT I: Chromatography

(12hrs.)

Classification of Chromatography methods. Column Chromatography- Principles, experimental procedures, stationary and mobile phases, Choice of Solvent Systems, Separation techniques. Applications.

R_f values, Factors affecting R_f values, Experimental procedures, Choice of paper and solvent systems, developments of chromatogram. Detection of the spots. Ascending, Descending and Radial Paper Chromatography, Two Dimensional Chromatography –Applications.

UNIT II: THINLAYER CHROMATOGRAPHY

(12hrs.)

Principles, factors affecting R_f values. Experimental Procedures, Choice of adsorbents and Solvents. Preparation of plates, development of the Chromatogram. Detection of the spots, advantages of thin Layer Chromatography over paper chromatography and Applications.

UNIT III: ION EXCHANGE CHROMATOGRAPHY

(12hrs.)

Principle, ion exchange resins and their types- cation exchange resins, anion exchange resins, ion exchange equilibria, properties of ion exchange resins, ion exchange capacity and techniques – applications.

UNIT IV: HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (12hrs.)

Introduction, instrumentation, stationary and mobile Phases. Mobile Phase – Composition. Column – Preparation, Cleaning –regeneration and Storage Conditions. Retention time- Types of HPLC. Applications.

UNIT V: GAS CHROMATOGRAPHY (12hrs.)

Principle, instrumentation choice of injectors, column and detectors - Programmed temperature chromatography, flow programming chromatography, gas-solid chromatography, and hyphenated techniques in chromatography- Applications of Gas chromatography.

REFERENCES:

1. Fundamentals of Analytical Chemistry – D.A.Skoog, D.M. West, F.J. Holler and S.R. Crouch – 2004; Thompson Asia Private Ltd., Bangalore.
2. Instrumental Methods of Analysis – B. K. Sharma, 2003; Goel publishing House, Meerut.
3. Contemporary Chemical Analysis - Judith F. Rubinson, Prentice Hall (India).
4. Instrumental Methods of Analysis Hobart H. Willard, Lynne L. Merritt Jr, John Dean, Wadsworth Publishing Co Inc; 7th Edn., 1988.
5. Thin Layer Chromatography- A laboratory Handbook, Ashworth, Stahl. E., 1st Edn., Springer-Verlag, 1969.
6. Dynamics of Chromatography - Principles and Theory, J. Calvin Giddings, CRC Press, 2002.
7. Principles of Instrumental Analysis, Douglas A. Skoog, F. James Holler, Stanley R. Crouch, 2006.

Paper III -Elective Paper 3

ADVANCED TOPICS IN PHYSICAL CHEMISTRY

No. of Hrs – 4 / Week

Credits - 4

Objectives

1. To study about the concept of Photochemistry
2. To understand the principles about the chemical kinetics
3. To learn about the thermodynamics behavior of systems in chemistry
4. To understand the physical characteristics of biomolecules
5. To understand the various concept of Analytical techniques

Unit I: Advanced Photochemistry (12hrs.)

Artificial photosynthesis and solar energy conversion – Photo electrochemical cells – dynamics of excited state processes (excited state energy, redox properties, emission lifetime and its temperature dependence) in micelles, reverse micelles and biomembranes – Fluorescence – quenching and anisotropy concepts; fluorescence sensing – mechanism and applications; Radioactive decay engineering – metal-enhanced fluorescence and surface Plasmon-coupled emission.

Unit – II: Advanced chemical kinetics (12hrs.)

Experimental methods for fast reactions- temperature jump, pressure jump stopped flow and flash photolysis – pulse technique – short tube kinetics.

NMR studies in rate process - Enzyme kinetics of complicated systems – theory of diffusion controlled reactions.

Unit – III: Irreversible thermodynamics (12hrs.)

Internal heat & entropy production – relation of entropy production with flux & forces – phenomenological equation – Prigogine's principle of minimum entropy production at non-equilibrium stationary state.

Unit – IV: Biophysical chemistry (12hrs.)

Biomembranes (structure & function) – Active transport & passive transport – multiple equilibria – specific examples of multiple equilibria – Transport processes – general features of transport processes optical systems of rht e study of transport processes – self organizing systems

– (Micelles, lipids, cyclodextrins, liquid crystals, reverse micelles) their interactions and solutions properties.

Unit – V: Analytical techniques

(12hrs.)

Thermal methods: TGA, DTA, DSC, Thermometric titration - Adsorption/desorption techniques: BET and EGME methods of determination of external and total surface area.

References:

1. K. Kalyanasundaram, Photochemistry in Microheterogeneous Systems, Academic Press, Orlando, 1987.
2. Extended irreversible thermodynamics – David Jon, Jose casas Vazques, 2012
3. Understanding Non-equilibrium Thermodynamics – Geogy Lebon, David Jon- 02008
4. Chemical kinetics: Fundamentals & New developments, E.T. Denisov, Ergenii tinofeerich , 2003
5. Chemical Kinetics, Laidler
6. Biophysical chemistry Alan Cooper – 2011
7. Biophysical chemistry, James P. Allen – 2008
8. Fundamentals of Analytical chemistry – Douglas A. Skoog Donal M. west 2013

Paper III -Elective Paper 4

ADSORPTION AND CATALYSIS

No. of Hrs – 4 / Week

Credits - 4

Objectives

1. To study about the various adsorption process connected with catalysis process
2. To study about the preparation methods of adsorbents
3. To evaluate the physico chemical properties of adsorbent by spectral studies
4. To study about the vapour phase and liquid phase catalysis and adsorption parameters
5. To learn about the adsorption isotherms and product analysis

Unit: I Adsorption & Catalysis

(12hrs.)

Concept of adsorption – types of adsorption, monolayer and multilayer adsorption. Adsorption - activation energy and temperature relationships, different between adsorption and catalysis, catalysis - homogeneous catalysis, heterogeneous catalysis, Acid -- base catalysis.

Unit: II Methods of preparation

(12hrs.)

Adsorbent - adsorbent preparation from plant materials, activated carbon preparation, synthetic adsorbent/catalyst - Molecular sieves – microporous & mesoporous molecular sieves – silicates, Aluminosilicates, Aluminophosphates – structure, acidic and basic sites.

Unit: III Spectral studies on Adsorbent

(12hrs.)

Characterization of adsorbent and catalyst - X-Ray Diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR), Differential thermal analysis(DTA) , Nuclear magnetic resonance spectroscopy (NMR), Temperature programmed desorption (TPD), Electron spin resonance spectroscopy(ESR) Scanning electron microscopy(SEM), BET Surface Area, pore size analysis.

Unit: IV Reactions & Factors

(12hrs.)

Liquid phase - heterogeneous reaction conditions optimization - Temperature, pH, time and molar ratios. Vapor phase reaction, Regeneration of catalyst.

Adsorption – adsorption of dye molecules, metal ions, sugar molecules and other suitable molecules, conditions optimization – time, temperature, p^H , concentration and adsorbent dosage.

Unit: V Techniques

(12hrs.)

Product analysis in catalysis reactions – Gas chromatographic technique, conversion and product selectivity. Interpretation of adsorption parameters - Adsorption kinetics, adsorption isotherms and adsorption thermodynamics.

References:

1. Environmentally stable adsorbent of tetrahedral silica and non tetrahedral alumina for removal and recovery of malachite green dye from aqueous solution, *J. Hazardous materials*, 157 (2008) 137-145.
2. Plant poisoning organic dyes adsorption on tomato plant root and green carbon from aqueous solution, *Desalination*, 249 (2009) 1132-1138.
3. Film and pore diffusion modeling for the adsorption of direct red 81 on activated carbon prepared from balsamodendron caudatum wood waste, *Digest Journal of Nanomaterials and Biostructures*, Vol. 5, No 3, July 2010, p. 911 – 919
4. Plant toxic and non-toxic nature of organic dyes through adsorption mechanism on cellulose surface, *Journal of Hazardous materials*, 189 (2011) 294–300.
5. Adsorption of cationic and anionic organic dyes from aqueous solution using Silica, *J. Environmental Science and Engineering*, volume 52, No.4 (2010) 361-366
6. Hazardous dyes removal from aqueous solution over mesoporous aluminophosphate molecular sieves with textural porosity by adsorption, *Journal of Hazardous Materials* 244– 245 (2013) 10– 20.
7. A Simple Method for the Synthesis of Thermally Stable Large Pore Mesoporous Aluminophosphate Molecular Sieves, *Materials letters*, 113 (2013) 93–95.
8. Aniline methylation over AFI and AEL type molecular sieves, *App. Catal.*, Vol. 174, 1998, 213.
9. Adsorptive removal of metanyl yellow on mesoporous Nickel aluminophosphate molecular sieves from aqueous solution, *Asian J. of chemistry*, vol. 24, no.12(2012), 5775-5778
10. Recent trends in catalysis, Narosa publication, 1st edition 2000.

Paper III -Elective Paper 5

NANOMATERIALS AND THEIR APPLICATIONS TO SOLAR ENERGY CONVERSION

No. of Hrs – 4 / Week

Credits - 4

Objectives

1. To study about the Nanomaterials
2. To study about the dye-sensitized solar cells
3. To learn about the Semiconductor and microemulsion (quantum dots)
4. To understand the Photochemistry and corrosion principles
5. To understand about the solar cell concepts

Unit I: Nanomaterials

(12hrs.)

Introduction to Nanoscience: Introduction- definition of Nanoscience, nanochemistry- classification of the nanomaterials

Synthesis of nanomaterials: Precipitative methods – hydrothermal and solvothermal methods - chemical methods - reduction methods – colloidal and micellar approach – sol-gel method – chemical vapor deposition method.

Specialized Nanomaterials: Metal oxide nanoparticles, semiconductor nanoparticles and core/shell nanoparticles

Unit II: Dye-sensitized solar cells

(12hrs.)

Solar energy conversion and storage – photo electrochemical cells – dye-sensitized solar cells – design and fabrication - power conversion efficiency

Use of metal and metal-free dye sensitizers in photovoltaic devices.

Unit III: Semiconductor and microemulsion (quantum dots)

(12hrs.)

Review of published literature – Water-soluble silica-coated semiconductor quantum dots – synthesis, characterization and properties.

Thickness-controllable silica coating of quantum dots – synthesis by microemulsion method and application in the growth of rice.

Unit IV: Photochemistry and corrosion

(12hrs.)

Review of published literature – Silica coated cadmium sulfide nanocomposites – synthesis, structure, optic and its photo catalytic properties.

Zirconia-coated carbonyl iron particles – synthesis and corrosion study.

Unit V : Solar cell

(12hrs.)

Review of published literature – Ruthenium (II) sensitizer in dye-sensitized solar cells using an organic dye as co-sensitizer – Fabrication and device characterization - photovoltaic performance.

Dye-sensitized solar cells - Co-sensitization strategy – electrochemical properties – Photo electrochemical performances – Electrochemical impedance spectroscopy – dark current measurement – Open-circuit voltage decay.

References

1. H. R. Allcock, Introduction to Materials Chemistry, John Wiley & Sons, Inc. Publication, 2008.
2. T. Pradeep, Nano: The Essentials, Tata Mc Graw-Hill, 2007.
3. A. Hagfeldt, *et al.* Chem. Rev., 2010, 110, pp. 6595–6663.
4. J. Gong, J. Liang, K. Sumathy, Renewable and Sustainable Energy Reviews, 2012, 16, 8, 5848-5860.
5. X. Chen, F. Liu, Q. Jiang, L. Sun, Q. Wang, J. Inorg. Organomet. Polym, 2012, 22:6-11.
6. A. Wang, Y. Zheng, F. Peng, J. Spectros. 2014, Article ID 169245, 1-5.
7. N. Gupta, B. Pal, J. Colloid and Int. Sci., 2010, 368, 250-256.
8. R. Chen et al. J. Colloid and Int. Sci., 2010, 342, 49-56.
9. U. Mehmood, I. A. Hussein, K. Harrabi, N. Tabet, G. R. Berdiyrov, RSC Adv., 2016, 6, 7897-7901.
10. L. Wei, Y. Na, Y. Yang, R. Fan, P. Wang, L. Li, Phys. Chem. Chem. Phys., 2015, 17, 1273-1280.

Paper III -Elective Paper 6

PHYTO-BIOSYNTHESIS AND APPLICATIONS OF METAL NANOPARTICLES

No. of Hrs – 4 / Week

Credits - 4

Objectives

1. To study about the Extraction and Isolation of natural products from Medicinal plants
2. To synthesis nanomaterial by using natural products
3. To understand the physico chemical properties of Nanoparticles
4. To utilize the nanoparticles for Biological Applications
5. To study the Nanoparticles application on Green catalysis

Unit I - Extraction and Isolation of some Indian Medicinal plants (12hrs.)

- i) Solid-Phase Extraction and LC–MS analysis of Pyrrolizidine Alkaloids in Honeys.
- ii) Comparative study of phytochemical screening, antioxidant and antimicrobial capacities of fresh and dry leaves crude plant extracts of *Datura metel* L.

Unit II – Biosynthesis of Metal Nanoparticles (12hrs.)

- i) Green synthesis of silver nanoparticles using *Ixora coccinea* leaves extract.
- ii) Ultrasmall Copper Nanoparticles Synthesized with a Plant Tea Reducing Agent.

Unit III – Characterization of Nanoparticles (12hrs.)

- i) Phytosynthesis of silver nanoparticles using *Coccinia grandis* leaf extract and its application in the photocatalytic degradation
- ii) A facile synthesis of high optical quality silver nanoparticles by ascorbic acid reduction in reverse micelles at room temperature.

Unit IV – Biological Applications of Nanoparticles (12hrs.)

- i) The green synthesis, characterization and evaluation of the biological activities of silver nanoparticles synthesized from *Iresine herbstii* leaf aqueous extracts
- ii) In vitro evaluation of antioxidant and anticancer potential of *Morinda pubescens* synthesized silver nanoparticles.

Unit V – Green catalytic activity of Nanoparticles (12hrs.)

- i) Catalytic Reduction of 4-Nitrophenol using Biogenic Gold and Silver Nanoparticles Derived from *Breynia rhamnoides*.
- ii) Catalytic degradation of organic dyes using biosynthesized silver nanoparticles.

References

1. K. A. Beales, K. Betteridge, S.M. Colegate, J.A. Edgar. *Journal of Agric. Food Chem.* 2015, 63, 7421–7427
2. Tahiya Hilal Ali Alabri, Amira Hamood Salim Al Musalami, Mohammad Amzad Hossain, Afaf Mohammed Weli, Qasim Al-Riyami. *Journal of King Saud University – Science* 2014, 26, 237–243
3. Muthu Karuppiah, Rangasamy Rajmohan. *Materials Letters* 97 (2013) 141–143.
4. Aaron D. Brumbaugh, Katelyn A. Cohen, and Sarah K. St. Angelo. *ACS Sustainable Chem. Eng.* 2014, 2, 1933–1939.
5. Rajeswari Arunachalam, Sujatha Dhanasingh, Balasaraswathi Kalimuthu, Mani Uthirappan, Chellan Rose, Asit Baran Mandal. *Colloids and Surfaces B: Biointerfaces* 94, 2012, 226-230
6. Debabrata Singha, Nabajeet Barman, Kalyanasis Sahu. *Journal of Colloid and Interface Science* 413 (2014) 37–42.
7. C. Dipankar, S. Murugan. *Colloids and Surfaces B: Biointerfaces* 98 (2012) 112– 119
8. L. Inbathamizh, T. Mekalai Ponnuru, E. Jancy Mary. *Journal of pharmacy research* 6 (2013) 32-38.
9. Abilash Gangula, Ramakrishna Podila, Ramakrishna M, Lohith Karanam, Chelli Janardhana, and Apparao M. Rao. *Langmuir* 2011, 27, 15268 – 15274.
10. V.K. Vidhu, D. Philip. *Micron* 56 (2014) 54–62.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

MASTER OF PHILOSOPHY – COMMERCE
For Affiliated Colleges (Full-Time) – CBCS

(Revised Effective from the academic year 2018-2019 and thereafter)

OBJECTIVES

To Provide Exposure to emerging issues in the area of Commerce

To Undertake Research Problems on the Contemporary Issues with Social Relevance

To Persuade to Undertake Independent Projects and Consultancy

Scheme of Examination (Revised)

Sl.No	Semester	Subject	Credits	Hours / Week
1.	I	Core I – Research and Teaching Methodology	4	4
2.	I	Core II – Contemporary Functional Management	4	4
3.	I	Project Oriented Elective Course (Theory) – Professional Competencies	4	4
4.	II	Dissertation and Viva - Voce	12	-
		Total	24	-

PAPER-I
RESEARCH AND TEACHING METHODOLOGY

L T P C
2 1 1 4

Objectives:

- To enable the students acquire knowledge on Research methods.
- To enable the students develop understanding of Research design.
- To enable the students apply their knowledge in carrying out research.
- To enable the students develop skills to undertake research in select areas.

Unit-I - Research Approach

(12 L)

Research Approach - Research process-problem Identification-Research Designs-Principles-sample Design – Experimental Designs.

Unit-II – Sampling

(12 L)

Sampling – Probability and Non- Probability sampling – Measurement and scaling – Scaling Techniques- multidimensional scaling – data collection – primary and secondary, data Preparation – Process: Editing,Coding,Classification,Tabulation.

Unit-III - Data analysis

(12 L)

Data analysis – Testing of Hypothesis- Statistical Inferences- Parametric tests- t- test, Z-test, F-test, ANOVA – one way – two way – MANOVA -paired sign test - Non-Parametric test – Chi-Square test – U test - H test - Sign test; Factor analysis - Discriminate analysis- Multiple Correlation – Multiple Regression- statistical packages- SPSS – AMOS – Lisrel, Mendeley.

Unit-IV - Interpretation and Report Writing

(12 L)

Interpretation and Report Writing - Steps in writing report, Layout of research Report – Types of Reports – mechanics of writing a research report – Ethics in report writing- Plagiarism

Unit-V – Methodology of Teaching

(12 L)

Teaching – Objectives of Teaching, Phases of Teaching – Teaching Methods: Lecture Method, Discussion Method, Discovery Learning, Inquiry, Problem Solving Method, Project Method, Seminar – Integrating ICT in Teaching: Individualized Instruction, Ways for Effective Presentation with Power Point – Documentation – Evaluation: Formative, Summative & Continuous and Comprehensive Evaluation – Later Adolescent Psychology: Meaning, Physical, Cognitive, Emotional, Social and Moral Development – Teaching Later Adolescents.

Total: 60 L

Question Papers shall consist of questions in the proportion 60% Theory 40% Problem.

References:

1. Research Methodology: Methods and Techniques, C.R.Kothari, Gaurav garg, New Age International Publishers.
2. Business Research Methods – Donald Cooper & Pamela Schindler, TMGH, 9th edition.2016.
3. Business Research Methods – Alan Bryman & Emma Bell, Oxford University Press.2016.
4. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers. 2015
5. Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International. 418p.2015.
6. Sampath,K.,Panneerselvam, A. & Santhanam, S. (1984). Introduction to educational technology. (2nd revised ed.). New Delhi: Sterling Publishers.
7. Sharma,S.R.(2003),Effective classroom teaching modern methods, tools &techniques,Jaipur:Mangal Deep.
8. Vedanayagam, E.G, (1989), Teaching technology for college teachers, New York: Sterling Publishers.

PAPER-II
CONTEMPORARY FUNCTIONAL MANAGEMENT

L T P C
4 0 0 4

Objectives:

- To enable the students acquire overall knowledge on functional management.
- To enable the students develop understanding of the components of functional management.
- To enable the students apply the acquired knowledge in solving the business issues.
- To enable the students develop skills in areas of functional management.

Unit-I - General Management (12 L)

General Management - Modern Management response to globalization-deregulated environment – paradigm shift in management principles- diversification and advance in Information Technology

Unit-II - Human Resources Management (HRM) (12 L)

Human Resources Management (HRM) - Managing diversity-Dual Career Management-Glass Ceiling- Quality of Work Life (QWL)-Outsourcing HR Activities-Ethical issues in HRM- Dimensions of E-HRM.

Unit-III - Financial Management (12 L)

Financial management- Portfolio Management- Determinants –Investors preferences-Efficient portfolios – Corporate Restructuring -Mergers and Acquisitions- Corporate governance.

Unit-IV - Marketing Management (12 L)

Marketing Management - Service Marketing- CRM- Ethics in Marketing- Social Marketing- E-Marketing- Global Marketing

Unit-V - Information Technology in Business (12 L)

Information Technology in Business - Business pressure- Organizational responses -IT Support at different Organizational levels- Telecommunication and Networks – Internet, Intranet and Extranet- Information System for the Enterprises (ERP).

Total: 60 L

References:

1. P.SubbuRao, Management Theory and practice; Himalaya Publishing House.2006.
2. K.Aswhappa, Human Resources Management Text and Cases; MC Graw Hill pvt Ltd.2015.
3. Bhabatosh Banerjee, Fundamentals of Financial Management; PHI learning pvt Ltd.2014
4. IM Pandey ,Financial Management,Vikas Publishing House pvt Ltd.2015.
5. Tejashree Patankar; Marketing Management; International Book House.2014.
6. Alexis Lean, Mathews Lean; Introduction to Information System; Tata MC Graw Hill pvt ltd.2014.

PAPER-III
PROFESSIONAL COMPETENCIES

L T P C
4 0 0 4

Objectives:

- To enable the students acquire overall knowledge on Professional Competencies.
- To enable the students develop understanding on Professional Competencies.
- To enable the students apply the acquired knowledge Professional Competencies
- To enable the students develop skills of Professional Competencies.
- To enable the students to compete in the professional competitive examination.

Unit-I - Teaching Aptitude (12 L)

Teaching Aptitude- Modern methods of Teaching- Multimedia tools- Games and simulation relevant to the area of specialization

Unit-II - General Awareness (12 L)

General Awareness - Knowledge on Contemporary economic, social and Business issues- Reports on Industry and Trade analysis- People and Environment- Pollution and its impact on human life.

Unit-III – Communication (12 L)

Communication - Nature- Characteristics- types, barriers and effective classroom communication- Time Dynamics- visuals to improve verbs – Arts of Writing – Non verbal communication – word processing stations – Teleconferencing.

Unit-IV - Information Communication and Technology (12 L)

Information Communication and Technology - Concepts, advantages, disadvantages- using web as a tool of updating knowledge- Competency to download and save, ability to follow the right link.

Unit-V - Reasoning Aptitude (12 L)

Reasoning Aptitude - Number Series, letter series, codes; Relationships, Classification, understanding the structure of arguments- evaluating and distinguishing deductive, inductive reasoning.

Total: 60 L

References:

1. Arun Sharma, General Studies paper – II for civil services preliminary examination, McGraw Hill Education (india) Private Limited, New Delhi, 2016.
2. IBPS – Bank PO/MT/SO, CWA – VI , kiran institute of career excellence Pvt.Ltd., Delhi,2016.
3. Group –I, General Studies, sakthi’s publishing house, Chennai, 2017.
4. P.Subba Rao, Business Communication, Cengage learning India Pvt.Ltd.2012.
5. Mallika Nawal, Business Communication, , Cengage learning India Pvt.Ltd.2012

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI – 12

MPhil English (For affiliated colleges)

(For those who joined the course from the academic year 2018-2019 onwards -Fulltime)

Sl. No.	Sem	Course Title	Credits	LHrs/Wk
1.	I	Core –I- Research and Teaching Methodology	4	4
2.	I	Core—II – Critical Theory	4	4
3.	I	Elective –Contemporary Literature (or) Women’s Studies	4	4
4.	II	Project and Viva Voce	12	-
		Total	24	

MANONMANIAM SUNDRANAR UNIVERSITY

MPhil English

Paper - I

RESEARCH AND TEACHING METHODOLOGY

L T P C

OBJECTIVES:

4 0 0 4

1. To introduce the students to the research methodology associated with future courses in literature.
2. To make the students understand the methodology of research.
3. To enable the learners to prepare dissertation/thesis/journal papers.

Unit – I - Meanings and objectives of research (12 Hours)

Research in language and literature, Materials and tools of research (books, anthologies, thesauruses, encyclopedias, conference proceedings, unpublished thesis, newspaper articles, journals, govt. publications, e-journals, web references, research cities, printed and web indexes, etc. e-mail discussions groups, special libraries. Advanced study centers, virtual libraries, web search engines, etc.)

Unit – II – The Process of research (12 Hours)

Selecting a project: the survey of relevant literature: defining aims and objectives: designing hypothesis: scope and limitations: preparing a research proposal: planning, etc. – Mechanics of research

Unit – III – Presentation of Research (12 Hours)

Title, aims and objectives: research format: avoiding plagiarism: quoting and creating in-text citations (documentation); research findings; using standard style sheets.

Unit – IV – Language, style and types of discourses (12 Hours)

Diction, the style suitable for a literary thesis, Narration, Argumentation, Exposition, Description, Affective Fallacy. Dissociation of Sensibility, Figurative; Language, Intentional Fallacy, Objective Correlative, Pathetic fallacy, Point of view, Satire.

Unit – V – Methodolgy of Teaching (12 Hours)

Teaching – Objectives of Teaching, Phases of Teaching- Teaching Methods; Lecture Method, Discussion Method, Discovery Learning, Inquiry, Problem Solving Method, Project Method, Seminar – Integrating ICT in Teaching: Individualised Instruction, Ways for Effective Presentation with Power Point – Documentation – Evaluation ; Formative, Summative & Continuous and Comprehensive Evaluation – Later Adolescent Psychology: Meaning, Physical, Cognitive, Emotional, Social and Moral Development – Teaching Later Adolescents.

(Total 60 Hours)

References:

- Paltridge, B (2006). *Discourses Analysis: An Introduction*. London: Continuum Discourses
- Barry, Peter.2002. *Beginning Theory: an Introduction to Literary and Cultural Theory*. New York: Manchester United Press.
- Crystal, David. 1994. *The Cambridge Encyclopedia of the English Language*. London. CUP.
- Madden, Frank.2002. *Exploring Poetry*. London: Longman.
- Versonk, Peter.2002. *Stylistics*. Oxford:OUP
- Frow, John.2009. *Genere*, Routledge Publication
- Black Elizabeth, 2006. *Pragmatic, Stylistics*, Edinburgh University Press Ltd.
- Gilbaldi, *MLA Handbook for writers of Research Papers*(8th Edition)
- Sampath.K, Panneerselvam, A & Santhanam, S. (1984). *Introduction to Educational Technology (2nd revised ed.)* New Delhi; Sterling Publishers.
- Sharma, S.R.(2003). *Effective classroom teaching modern methods, tools & techniques*. Jaipur: Mangal Deep.
- Vedanayagam, E.G. (1989). *Teaching technology for college teachers*, New York: Sterling Publishers.

Paper –II CRITICAL THEORY

L T P C

Objectives:

(1) Acquainting the learners with the various literary theories.

4 0 0 4

(2) To make the students appreciate and criticize texts and works of art themselves.

UNIT – I Theory after Theory (12 Hours)

1. Peter Barry -- Legacies of Theory – Presentism – Presentism in practice – New Aestheticism – New aestheticism in practice – What to read on new aestheticism – Cognitive poetics – Cognitive poetics in practice – What to read on cognitive poetics.

2. Jonathan Culler – Structuralism and Literature

UNIT – II Marxist literary theories (12 Hours)

Roland Barthes - Andy Stafford and Susan McManus

Moyra Haslett - The politics of literature: Marxist Literary Theories

UNIT – III Feminist Theory (12 Hours)

Helene Cixous – Julia Dobson

Ruth Robbins - Will the real feminist theory please stand up?

UNIT – IV Deconstruction (12 Hours)

Paul de Man – The Resistance to Theory

Julian Wolfreys – Deconstruction, what remains unread

UNIT – V Postmodernism (12 Hours)

Cleanth Brooks - The Primacy of the Reader

Arkady Plotnitsky – Postmodernism and Postmodernity

(Total 60 Hours)

REFERENCES:

- Peter Barry, *Beginning Theory an Introduction to Literary and Cultural Theory* Third Edition
- S. Ramaswami & V.S. Sethuraman. *English Critical Tradition an Anthology of English Literary Criticism Volume 2*. Chennai. Trinity Press.
- *Contemporary Critical Theories From Lacan to Said*, Edited by Jon Simons, Edinburgh University Press.
- *Introducing Literary Theories: A Guide and Glossary* Edited by Julian Wolfreys, Edinburgh University Press.
- *Contemporary Criticism an Anthology* Edited by V.S. Sethuraman , Macmillan Publishers India Ltd.

Paper III – Elective I
Contemporary Literature

L P T C
4 0 0 4

Objectives:

- To familiarize the students with the literary works of different countries and cultures.
- To enable the learners to compare the different works and get a better understanding of them.

Unit I British Literature(12 Hours)

Poetry	Benjamin Zephaniah – 1) <i>We Refugees</i> 2) <i>The Race Industry</i>
Drama	Tom Stoppard - <i>Arcadia</i>
Fiction	Zadie Smith - <i>Swing Time</i>

Unit II American Literature(12 Hours)

Poetry -	Charles Bright- <i>North American Bear (The Norton Anthology of American Literature)</i>
Drama	Tracy Letts - <i>August: Osage County</i>
Fiction	Rachel Gold - <i>Being Emily</i>

Unit III African Literature(12 Hours)

Poetry	Francis Duggan -- <i>Racism is Around me Everywhere</i>
	Herbert Logerie -- <i>The Colour of Racism</i>
Drama	Athul Fugord -- <i>A Lesson From Aleos</i>
Fiction	Ben Okri -- <i>The Famished Road</i>

Unit Canadian Literature(12 Hours)

Poetry	Dorothy Livesay --1) <i>Green Rain</i> 2) <i>Nocturne</i>
Drama	Joan Mac Leod -- <i>The Valley</i>
Fiction	Michael Ondaatje -- <i>Divisadero</i>

Unit V South Asian Literature(12 Hours)

Poetry	Basil Fernando <i>Yet Another Incident in July 1983</i>
Drama	Girish Karnad <i>Wedding Album</i>
Fiction	Khalid Hosseine <i>And the Mountains Echoed</i>

(Total 60 Hours)

References:

1. David Lane - *Contemporary British Drama*, 2010.
2. Tracy J. Prince, *Culture Wars in British Literature: Multiculturalism and National Identity*, 2012.
3. Florence Stratton *Contemporary African Literature and the Politics of Gender*, 1994
4. Karen Meyers, Erik V. R. Rangno, Jerry R. Phillips, Michael Anesko *Contemporary American Literature, 1945 – Present*, 2010
5. W. J. Keith ,*Canadian Literature in English, Volume 2*, 2006
6. Alex Tickell, *South-Asian Fiction in English: Contemporary Transformation*

Elective – II
Women’s Studies

L P T C
4 0 0 4

Objectives:

- To sensitize the learners on the issues of women
- To analyze and interpret the various voices raised in support of women and to contribute towards women empowerment.

Unit I : Prose (12 Hours)

Virginia Woolf – *Modern Fiction*

Arundhati Roy -- *Walking with the Comrades*

Unit II : Poetry (12 Hours)

Carol Ann Duffy -- “Anna Hathaway” , “ Onion”

Sylvia Plath -- “Daddy” , “The Colossus”

Kamala Wijeyaretna -- “ On Seeing a White Flag Across a Road”

Imtiaz Dharkar – “Purdah I”

Unit III : Drama (12 Hours)

Susan Glaspel -- *Trifles*

Vinodini -- *Thirst*

Lorraine Hansberry -- *What Use are Flowers?*

Unit IV : Fiction (12 Hours)

Jeannette Winterson -- *Oranges are not the Only Fruit*

Mahasweta Devi – *Draupadi*

Unit V : Fiction (12 Hours)

Bama – *Karukku*

Chimamanda Ngozi Adichie – *Half of a Yellow Sun*

(Total 60 Hours)

References:

- Winterson, Jeanette. *Oranges Are Not the Only Fruit.* , 1987
- Nick Bentley, *Contemporary British Fiction*, 2008
- Angela Y. Davis, *Women, Race, & Class*, 2011.
- Kathy Davis, Mary Evans, Judith Lorber, *Handbook of Gender and Women's Studies*, 2006.

MANONMANIAM SUNDARANAR UNIVERSITY

M.Phil Mathematics (for Affiliated Colleges)

(From the academic year 2018 -19)

1. SCHEME OF EXAMINATION

Sl. No	Sem-ester	Paper title	Hrs/Week	Credits
1.	I	Research and Teaching Methodology	4	4
2.	I	Advanced Analysis	4	4
3	I	Project Oriented Elective Course (Theory)	4	4
4	II	Project and Viva Voce		12
		TOTAL		24

LIST OF PROJECT ORIENTED ELECTIVE PAPERS

- 1 Banach Algebra and Spectral Theory
- 2 Advanced Graph Theory
- 3 Harmonic Analysis
- 4 Theory of Near-rings
- 5 Advanced Calculus
- 6 Algebraic Graph Theory
- 7 Stochastic Modeling.
8. Wavelets

Core Paper- I

RESEARCH AND TEACHING METHODOLOGY (60 hours)

It is the study of commutative rings. The objective of the paper is to introduce algebraic structure through the modules and different types of modules and its algebraic application. A pass in PG level algebra course is the prerequisite for this paper. Outcome of this paper is to motivate students to do research in diverse fields such as homological algebra, algebraic number theory, algebraic geometry, finite fields and computational algebra.

- Unit I:** Rings and Ideals – Modules (12 hours)
- Unit II:** Rings and Modules fractions – Primary Decomposition (12 hours)
- Unit III:** Integral Dependence and valuations – Chain conditions (12 hours)
- Unit IV:** Noetherian Rings – Artin Rings (12 hours)
- Unit V:** Methodology of Teaching (12 hours)

Teaching - Objectives of Teaching, Phases of Teaching - Teaching Methods: Lecture Method, Discussion Method, Discovery Learning, Inquiry, Problem Solving Method, Project Method, Seminar - Integrating ICT in Teaching: Individual Instruction, Ways for Effective Presentation with Powerpoint - Documentation - Evaluation: Formative, Summative & Continuous and Comprehensive Evaluation - Later Adolescent Psychology: Meaning, Physical, Cognitive, Emotional, Social and Moral Development - Teaching Later Adolescents.

Text Book: Content and Treatment as in Atiyah and Macdonald, Introduction to Commutative Algebra, Chapters 1 to 9.

References:

1. Sampath, K., Pannerselvam, A. & Santhanam, S. (1984). Introduction to educational technolog. (2nd revised ed.). New Delhi: Sterling Publishers.
2. Sharma, S. R. (2003). Effective classroom teaching modern methods, tools & techniques. Jaipur: Mangal Deep.
3. Vedanayagam, E. G. (1989). Teaching technology for college teachers. New York: Sterling Publishers.

Core Paper II

ADVANCED ANALYSIS (60 hours)

Preamble: The objective of the paper is to understand borel measure in real and complex. Field. Prerequisite for this course is a good knowledge in calculus, real and complex analysis, topology and measure theory concepts. Motivation is to prepare scholars with L_p spaces for the study of analysis.. The out come of this paper is to help the students to undertake further research in Fourier analysis, Harmonic analysis and Functional analysis.

Unit I : Abstract Integration : The concept of measurability – Simple functions – Elementary properties of measures – Arithmetic in $[0, \infty]$ - Integration of positive functions – Integration of complex functions – The role played by sets of measure zero. (12 hours)

Unit II : Positive Boral Measures : Topological preliminaries – The Riesz representation theorem – Regularity properties of Borel measures – Lebesgue measure – Continuity properties of measurable functions. (12 hours)

Unit III : Complex Measures : Total variation – Absolute continuity – Consequences of the Radon-Nikodym theorem – Bounded linear functions on L^p - The Riesz representation theorem. (12 hours)

Unit IV : H^p - Spaces : Sub-harmonic functions – The spaces H^p and N - The theorem of F. and M. Reisz – Factorization theorems – The shift operator – Conjugate functions. (12 hours)

Unit V : Fourier Transforms : Formal properties – The inversion theorem – The Plancherel theorem – The Banach algebra L^1 .

Holomorphic Fourier Transforms : Two theorems of Paley and Wiener – Quasi-analytic classes – The Denjoy- Careman theorem. (12 hours)

Text Book : Content and Treatment as in Walter Rudin, Real and Complex Analysis, Third Edition, Chapters 1, 2, 6, 9, 17 and 19.

PAPER III

PROJECT ORIENTED ELECTIVE COURSE (THEORY)

1. BANACH ALGEBRA AND SPECTRAL THEORY (60 hours)

Preamble: This syllabus is designed to introduce the students to the topics of Banach algebra and Hilbert spaces. Knowledge expected is to be aware of the background concepts in algebra. The students are expected to know about functionals. This will motivate the students to learn about various operators and their characteristics.

Unit I: Banach algebras – Complex Homomorphisms – Basic properties of Spectra – Symbolic Calculus. (12 hours)

Unit II: Differentiation - Group of invertible elements – Commutative Banach algebra – Ideals and Homomorphisms – Gelfand transforms. (12 hours)

Unit III: Involutions – Applications to non commutative algebra – Positive Linear functionals. (12 hours)

Unit IV: Bounded Operators on Hilbert spaces – Bounded Operators – A commutativity theorem – Resolution of the Identity – Spectral theorem. (12 hours)

Unit V: Eigen values of normal operators – Positive operators and square roots – Group of invertible operators – Characterization of V^* algebra. (12 hours)

Text Book: Content and Treatment as in Rudin, Functional Analysis, Tata McGraw Hill, Chapters 10,11 & 12.

2. ADVANCED GRAPH THEORY (60 hours)

Preamble: This course aims to introduce the learner some topics for his research in graph theory. It provides several conjectures and open problems to widen the scope of research. The pre-requisite for the course is a sound knowledge in graph theory at the post-graduate level. The outcome of the course is identification area and problems for research in graph theory.

Unit I: Dominating sets in graphs - Bounds on the domination number: in terms of order, degree, size, degree, diameter and girth. (12 hours)

Unit II: Product graphs and Vizing's conjecture – Domatic number - Nordhaus-Gaddum type theorems - dominating functions. (12 hours)

Unit III: Decompositions and colorings of a graph – Generalizations of graph decompositions. (12 hours)

Unit IV: Necessary conditions for the existence of a G-decomposition of a graph - Cycle decompositions, Vertex labelings and graceful graphs. (12 hours)

Unit V: Perfect graphs: The perfect graph theorem – p-critical and partitionable graphs – A polyhedral characterization of perfect graphs and p-critical graphs – The strong perfect graph conjecture (and recent theorem). (12 hours)

Text Books: Content and Treatment as in

- 1) Teresa W. Haynes, Stephen T. Hedetniemi and Peter J. Slater, Fundamentals of Domination in graphs, Marcel Decker (1998), Section 1.2, 2.1to2.4 (For Unit I)
Sections 2.6, 8.3, 9.1 and 10.1 to10.3 (for Unit II)
- 2) Juraj Bosak, Decompositions of graphs , Kluwar Academic Publishers, Chapters 2, 3 4, 6 and 7. (for Units III and IV)
- 3) Martin Charles Golumbic, Algorithmic graph theory, Academic Press, Chapter 3 (for Unit V)

3. HARMONIC ANALYSIS (60 hours)

Preamble: Periodic functions play a vital role in solving many problems in Mathematics and Physics. Fourier analysis is the study of various aspects of periodicity of functions. Harmonic Analysis is a natural generalization of Fourier analysis and is significant for its mathematical aspect. The pre requisite for this course is a basic knowledge of Real and Complex analysis covered in a post graduate programme in Mathematics. The outcome of the course is to help researchers in both pure and applied mathematical fields.

Unit I: Fourier series and integrals – Definitions and easy results – The Fourier transform – Convolution – Approximate identities – Fejer’s theorem – Unicity theorem – Parseval relation – Fourier Stieltjes Coefficients – The classical kernels. (12 hours)

Unit II: Summability – Metric theorems – Pointwise summability – Positive definite sequences – Herglotz’s theorem – The inequality of Hausdorff and Young. (12 hours)

Unit III: The Fourier integral – Kernels on \mathbb{R} . The Plancherel theorem – Another convergence theorem – Poisson summation formula – Bachner’s theorem – Continuity theorem. (12 hours)

Unit IV: Characters of discrete groups and compact groups – Bochners’ theorem – Minkowski’s theorem. (12 hours)

Unit V: Hardy spaces- Invariant subspaces – Factoring F and M . Rieza theorem – Theorems of Szego and Beuoling. (12 hours)

Text Book: Content and Treatment as in Henry Helson, Harmonic Analysis, Hindustan Book Agency, Chapters 1.1 to 1.9, 2.1 to 3.5 and 4.1 to 4.3.

4. THEORY OF NEAR-RINGS

(60 hours)

Preamble: The main objective of this course is to provide the knowledge about the generalized ring structures. In fact, near-ring is a natural generalization of rings in the sense that the set of all endomorphisms of a group form a ring, where the set of all mappings of a group form a near-ring. The structure of near-rings is useful in project geometry to deal about generalized field conditions.

Unit I: The elements of theory of near-rings. **(12 hours)**

Unit II: Ideal theory. **(12 hours)**

Unit III: Elements of structure theory. **(12 hours)**

Unit IV: Near-fields. **(12 hours)**

Unit V: More classes of near-rings. **(12 hours)**

Text Book: Content and Treatment as in G. Pilz, Theory of Near-rings, North Holland, Chapters 1,2,3, 8(a), 9(a) and 9(b).

5. ADVANCED CALCULUS (60 hours)

Preamble: The Calculus of several variables involves many branches of Mathematics such as Partial Differential Equations, Optimization, Statistics etc. The main objective of this course is to give a thorough understanding of differentiation and integration of functions of several variables. The prerequisite is a precise knowledge of Calculus of single variable. The outcome of the course is the ability to solve problems involving several variables.

Unit I : Differentiation – Basic theorems – Partial derivatives – Derivatives – Inverse functions. **(12 hours)**

Unit II : Implicit functions – Integration – Measure zero and Content zero – Integrable functions. **(12 hours)**

Unit III : Fubini's theorem – Partitions of Unity – Change of Variables. **(12 hours)**

Unit IV : Integration on chains - Algebraic preliminaries – Fields and Forms - Geometric preliminaries – The fundamental theorem of Calculus. **(12 hours)**

Unit V : Manifolds – Fields and Forms on Manifolds – Stokes' theorem on Manifolds - The Volume element – The Classical theorems. **(12 hours)**

Text book : Calculus on Manifolds by Michael Spivak, The Benjamin / Cummings Publishing Company. **(12 hours)**

References : (1) Mathematical Analysis by Tom M. Apostol, Narosa Publishing Company.
(2) Advanced Calculus by Gerald B.Folland, Pearson Publishing Company.

6. ALGEBRAIC GRAPH THEORY (60 hours)

Preamble: This course aims to improve the knowledge of the learner to apply algebra in graph theory. It is framed to give adequate exposure about algebraic approach to graph theory. The beginner of this course is expected to have sound understanding of graph theory and algebra at PG level. The outcome of the course is to enable the student to do qualitative research in algebraic graph theory.

Unit 1: Linear Algebra in graph theory: The spectrum of a graph – Regular graphs and line graphs - The homology of graphs. **(12 hours)**

Unit 2: Spanning trees and associated structures – Complexity – Determinant expansions. **(12 hours)**

Unit 3: Symmetry and regularity of graphs: General properties of graph automorphisms – Vertex-transitive graphs – Symmetric graphs – Trivalent symmetric graphs. **(12 hours)**

Unit 4: The Covering - graph construction – Distance-transitive graphs - The feasibility of intersection arrays. **(12 hours)**

Unit 5: The Laplacian of a graph: The Laplacian matrix – trees – representations – energy and eigenvalues – connectivity – the generalized Laplacian – Multiplicities – embedding. **(12 hours)**

Text Books:

1. **Norman Biggs**, Algebraic Graph Theory, Cambridge University Press, London, 1974.
Chapters 2, 3 and 4 for Unit I, 5, 6 and 7 for Unit II, C 15, 16, 17 and 18 for Unit III, 19, 20 and 21 for Unit IV.
2. **Chris Godsil, Gordon Royle**, Algebraic Graph Theory, Springer-Verlag, New York, 2006. Chapter 13 (Sections 13.1 to 13.6, 13.9 to 13.11) for Unit V.

7. STOCHASTIC MODELING

(60 hours)

Preamble: The theory of stochastic modelling is considered to be an important contribution to mathematics and it is an active topic of research. It is concerned with concepts and techniques and it is oriented towards a broad spectrum of mathematical, scientific and engineering interests. Characterization, structural properties, inferences and control of Stochastic processes are covered in every unit. The paper is designed to get deep knowledge of stochastic processes.

Recap : Basics of Probability space random variable – Discrete distributions and Continuous distributions – Expectation – Conditional Expectation – Moment Generating Function – Probability Generating Function – Laplace Transform – Joint Distributions – Functions of random variables and random vectors.

Unit I : Markov chains : Transition probability matrix of a Markov chain – First step Analysis – Functional of Random walks and successive runs – classification of states – Basic Limit Theorem of Markov Chain. (12 hours)

Unit II : Continuous time Markov Chains : Poisson distribution and Poisson process – Distributions associated with Poisson process – Pure Birth Process – Pure Death process – Birth and Death Process – Limiting behavior of Birth and Death Process – Birth and Death Process with absorbing states. (12 hours)

Unit III : Renewal Phenomena : Renewal process and Related concepts – Poisson process viewed a Renewal Process – Asymptotic behavior of Renewal process. (12 hours)

Unit IV : Branching Process and Population Growth : Branching process – branching process and generating functions – Geometrically distributed offspring – variation on Branching process – Stochastic models of Plasmid Reproduction and Plasmid copy Number partition. (12 hours)

Unit V : Queueing Systems : Queueing Processes – Poisson Arrival and exponentially distributed service times – The M/G/1 and M/G/∞ systems – variations and extensions. (12 hours)

Text Book : Content and Treatment as in Howard M. Taylor and Samuel Karlin, An Introduction to Stochastic Modeling (Revised Version), Academic Press, New York, 1984.

8. WAVELETS

(60 hours)

Preamble: Wavelet analysis has drawn much attention from both mathematicians and engineers alike. The emphasis of the course is on spline wavelets and time-frequency analysis. The only pre-requisite is a basic knowledge of function theory and real analysis. The outcome of the course is to enable the learner to apply the pure mathematics in signal processing and image analysis.

Unit I : An Overview : Fourier to Wavelets – Integral Wavelets Transform and Time frequency analysis – Inversion formulas and duals – Classification of Wavelets – Multi-resolution analysis – Spines and Wavelets.

Fourier Analysis : Fourier and Inverse Fourier Transformation – Continuous Time Convolution – The delta function – Fourier Transformation of square integrable functions. (12 hours)

Unit II : Fourier Analysis (contd): Fourier Series – Basic Convergence Theory – Poisson Summation Formula.

Wavelet Transforms and Time Frequency Analysis : The Gabor Transforms – Short time Fourier Transforms and the uncertainty principle – The integral Wavelet Transform – Dyadic Wavelets – Inversion – Frames – Wavelet Series. (12 hours)

Unit III : Cardinal Spline Analysis : Cardinal Spline spaces – B-splines and their basic properties – The time scale relation and an interpolating graphical display algorithm – B-Net representations and computation of cardinal splines - Constructions of cardinal splines – constructions of spline application formulas – Construction of Spline interpolation formulas. (12 hours)

Unit IV : Scaling functions and Wavelets : Multi-resolution analysis – Scaling functions with finite two scale relation – Direction sum Decompositions of $L^2(\mathbb{R})$ - Wavelets and their duals. (12 hours)

Unit V : Cardinal Splines Wavelets : Interpolating splines wavelets – Compactly supported spline – Wavelets – Computation of Cardinal spline Wavelets – Euler – Frebenious Polynomials. (12 hours)

Orthogonal Wavelets : Examples of orthogonal Wavelets - Identification of orthogonal two scale symbols - Construction of compactly supported orthogonal wavelets. (12 hours)

Text Book : Content and Treatment as in Charles K. Chui, An introduction to Wavelets, Academic Press, New York, 1992.

Reference Books :

1. Chui C. K. (ed), Approximation theory and Fourier Analysis, Academic Press Boston, 1991.
2. Daribeckies I, Wavelets, CBMS-NSF Series in Appl, SIAM Philadelphia, 1992.
3. Schurnaker L, L. Spline Functions : Basic Theory, Wiley, New York, 1981.
4. Nurnberger G, Applications to Spline Functions, Springer Verlag, New York, 1989.

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI – 12
DEPARTMENT OF PHYSICS
M. Phil. (Physics) For Affiliated Colleges- Choice Based Credit System (CBCS)
(From the academic year 2018-2019 onwards)

S. No.	Semester	Subject	Credits	Teaching Hours / week
1	I	Research and Teaching Methodology	4	4
2	I	Advanced Physics	4	4
3	I	Project related Elective (section 3.1)	4	4
4	II	Project and Viva-voce	12	-
Total			24	-

PAPER – 1: RESEARCH AND TEACHING METHODOLOGY

Preamble: To introduce the knowledge on research. This paper provides a broad knowledge on methods of research, problem solving and analytical techniques

Unit - I: Research Methodology (12 hrs)

Methods of Research and Methodology of Research – Types of Research – Selection of Research Topic and Problem – Literature survey – Reference collection – Internet and its applications – Infilbnet - Accessing the current status – Mode of Approach – Actual Investigation – Results and Conclusion – Presenting a paper in a Scientific Seminar – - Art of writing a Research Paper – Layout of M.Phil. Dissertation

Unit - II: Statistical Methods And Simulations (12 hrs)

Statistical description of data: Mean, Variance, Skewness, Median, Mode; Distributions: Binomial, Poisson, Gaussian – Student's t-test and chi-square test - Simulation studies (theory only): Generation of uniform random numbers by Park - Miller method – Gaussian random number generation – Box-Muller method – Basic ideas of Monte-Carlo method – Evaluation of definite integrals and value of π .

Unit – III: Numerical Methods (12 hrs)

Curve fitting: straight line and exponential, Numerical integration: Composite Trapezoidal rule, Interpolation: Newton's forward and backward interpolation – Numerical integration – Ordinary differential equation: Fourth order Runge-Kutta method – Eigen value problem

Unit – IV: Analytical Techniques (12 hrs)

Analytical techniques –X - Ray Diffraction – SEM and TEM techniques – XPS – TG-DTA – Hall measurement – VSM and EDAX

Unit – V: Methodology of Teaching (10 hrs)

Teaching – Objectives of Teaching, Phases of Teaching – Teaching Methods: Lecture Method, Discussion Method, Discovery Learning, Inquiry, Problem Solving Method, Project Method, Seminar – Integrating ICT in Teaching: Individualised Instruction, Ways for Effective Presentation with Power Point – Documentation – Evaluation: Formative, Summative & Continuous and Comprehensive Evaluation – Later Adolescent Psychology: Meaning, Physical, Cognitive, Emotional, Social and Moral Development – Teaching Later Adolescents.

Books for Study and References

1. J. Anderson, B.H. Durstan and M.Poole, Thesis and Assignment Writing (Wiley Eastern, New Delhi,1977)
2. Rajammal P. Devadas, A Handbook of Methodology of Research (S.R.K. Vidyalaya Press, Chennai, 1976)
3. G.B.Arffken and H.J.Weber, Mathematical Methods for Physicists (Academic Press,2005)
4. C.R.Kothari, Research methodology methods and techniques
5. Vijaya How to teach science
6. J A Belk: Electron Microscopy and Microanalysis of Crystalline Materials (Applied Science Publishers), 1979.
7. K.P.N. Murthy, Monte - Carlo Basics (ISRP, Kalpakkam, 2000)
8. K.P.N. Murthy: Monte-Carlo Methods (University Press, 2004)

9. Louis A. Pipes and Lawrence R. Harvill: Mathematical Physics for Engineers and Physicists (McGraw Hill International, Singapore, 1971)
10. Hobart H. Willard, Lynne L. Merritt, Jr., and John A. Dean, Instrumental Methods of Analysis
11. Sampath K, Panneerselvam, A & Santhanam S (1984). Introduction to educational technology. (2nd revised ed.) New Delhi: Sterling Publishers.
12. Sharma. SR (2003) Effective classroom teaching modern methods, tools & techniques. Jaipur: Mangal Deep
13. Vendanayagam EG (1989). Teaching technology for college teachers. New York: Sterling Publishers.

Paper - 2: ADVANCED PHYSICS

Preamble: To impart knowledge on various materials of technological importance. To make the students learn the basics of quantum mechanical calculations, nanomaterials, thin films, environmental physics and biophysics

Unit - I: Quantum Mechanical Calculations (12 hrs)

Molecular orbital theory - Basis set – Electronic structure methods – Semi empirical methods – *Ab initio* methods - density functional theory methods – Z-matrix - geometry optimization – Harmonic Vibrational analysis – Atoms in molecules charges and bond order – Potential energy surface – Mullican population analysis – Vibrational circular dichroism intensities – Softwares: MOPAC, Gaussian.

Unit - II: Nanomaterials (12 hrs)

Nanomaterials: Salient features – Different methods of fabrication – Physical and chemical methods - Characterisation – Effect of size on various physical properties – Applications – Quantum wells, wires, dots – Fullerenes – Nanotubes – Carbon Nanotubes

Unit - III: Thin Films (12 hrs)

Thin films - Fundamentals and Salient features – Different methods of preparation – Solution growth - Spray Pyrolysis – Electrodeposition - Thermal evaporation – Flash evaporation – Electron beam evaporation – Thickness measurement method – Applications of thin films.

Unit - IV: Environmental Physics (12 hrs)

UV radiation impact on human health – Ozone formation – Depletion of Ozone layer – Conservational methods – Montreal Protocol – Effect of Nuclear Radiation - Radioactive Pollution – IR radiation and its effect – Green house effect – Global warming – Impact of microwave radiation.

Unit - V: Biophysics (12 hrs)

Molecular alphabets of life (Amino acids, nucleic acid bases, saccharides and lipids) – Roles of biomolecules in biological functions – Geometry of biomolecules – Conformation and Configuration – Lennord-Jones potential – Basis of molecular interactions – Various bonds involved in structural stabilization of biomolecules

Books for Study and References

1. Rodney Cotterill: Biophysics: An Introduction (John Wiley & Sons), 2003.
2. G. Cao: Nanostructures & Nanomaterials: Synthesis, Properties & Applications, (Imperial College Press), 2004.
3. B.D. Cullity: Elements of X-ray diffraction, (Addison – Wesley, London), second edition, 1977.
4. A.Goswami: Thin film fundamentals (New Age international (P) Ltd., New Delhi), 2006.
Charles P. Poole Jr and Frand J. Owens : Introduction to Nanotechnology, (John Wiley & Sons), 2003.
5. Vasantha Pattabhi, Gautham N: Biophysics (Narosa Publishing House, 2ndEdition), 2011

Paper - 3(a): MATERIALS SCIENCE

Preamble: To expose the students with theoretical aspects of materials science. To provide the knowledge about phase diagrams, mechanical properties, ceramics, polymers, plastics and crystals.

Unit – I: Phase Diagrams (12 hrs)

Solid solutions and intermediate phases – Equilibrium phase diagrams, Cu-Ni, Pb-Sn, Al-Cu system phase diagrams – Free energy and equilibrium phase diagrams – Nucleation and growth – Martensitic transformation – Strengthening mechanisms – Iron-Carbon system – Alloy steels – Aluminium-Copper system – Copper-Zinc system – Corrosion

Unit - II: Mechanical Properties (12 hrs)

Stress- Strain curve – Elastic deformation: Characteristics, Atomic mechanism, Shear stress, Bulk modulus, Strain energy, Strain deformation – Viscous deformation: Spring-Dashpot models – Anelastic and Viscoelastic deformation: Viscoelastic models – Plastic deformation: Dislocations and Stress-strain curves, Plasticity theory – Fracture: Ideal fracture, Brittle fracture, Fracture mechanics, Cohesive models, Ductile fracture – Mechanical testing

Unit - III: Ceramics (12 hrs)

Structure of ceramics – Production of ceramics: Raw materials, Forming and Post-forming processes – Production of glass: Melting of glass, Glass forming and annealing – Mechanical properties of ceramics – Wear and erosion resistance – Thermal shock – Silica-Alumina system – Commercial systems: Zirconia, Sialones, Cement and Concrete

Unit - IV: Polymers and Plastics (12 hrs)

Molecular structure: Monomers & Polymers, Synthesis, Molecular weight measurement, Branching & Tacticity, Copolymers and blend – Mechanics of polymer chain: Freely jointed chains, Entanglements, Rubber elasticity – Thermoplastic melts: Viscosity, Shear thinning, Processing, Extrusion – Amorphous polymers: Solidification, glass transition, Various models – Crystalline polymers – Crosslinked polymers: Elastomers, Thermosets – Liquid crystal polymers – Mechanical properties: Stress-Strain behaviour – Chemical properties

Unit - V: Crystals (12 hrs)

Crystal growth from solution – Melt growth techniques: Bridgman method, Czochralski crystal pulling technique, Crystal growth from Vapour phase – Crystal Imperfections – Point defects: Vacancies, interstitials, Impurities, electronic defects – Line defects: Edge dislocation, Screw dislocation – Surface defects: Grain boundaries, Tilt boundaries, Twin boundaries, Stacking faults, Ferromagnetic domain walls – Volume defects: Cracks, Voids

Books for Study and References

1. J.C.Anderson, K.D.Leaver, P. Leever and R.D.Rowlings, Materials Science for Engineers, Nelson Thomas Ltd, First Indian reprint, 2010
2. M.Arumugam, Materials Science, Anuradha Agencies, Publishers, Second Edition, Fifth Reprint, 2005
3. R,Balasubramaniam, Materials Science and Engineering, Wiley India (P) Ltd, 2010
4. V.Raghavan, Materials Science for Engineering, Prentice Hall of India Pvt Ltd, 2006

Paper - 3(b): NANOMATERIALS

Preamble: To felicitates the knowledge on nanomaterials. To make the students understanding the fundamental aspects of nanomaterials, synthesis, nanostructures, properties and characterization techniques

Unit-I: Synthesis (12 hrs)

Sol-Gel and Precipitation technologies - Ball milling - RF plasma - Combustion Flame - Chemical Vapor Condensation process – Electrodeposition - Laser synthesis - Gas phase condensation - Sonochemical.

Unit-II: Nanostructures (12 hrs)

Preparation of quantum nanostructures: Preparation - Size and Dimensionality Effects – Excitations - Single-Electron Tunneling - Applications. Nanomachines and Nano devices: Micoelectrochemical systems – Nano electrochemical systems - Molecular and Super molecular switches.

Unit-III: Properties (12 hrs)

Properties of Individual Nanoparticles: Metal Nanoclusters – Semiconducting Nanoparticles - Rare Gas and Molecular clusters. Bulk Nanostructured Materials: Solid disordered Nanostructure - Nanostructured crystals.

Unit - IV: Characterization Techniques (12 hrs)

Structural: Powder XRD & particle size determination, Neutron diffraction; Spectroscopic: X-ray Photoelectron (XPS), Photoluminescence, Impedance and Energy Dispersive X-ray (EDAX) spectroscopy.

Unit - V: Characterization Techniques (12 hrs)

Thermal: Differential Thermal Analysis (DTA), Differential Scanning Calorimetry (DSC); Microscopic: Atomic Force Microscopy (AFM); Electrical and Magnetic: Four - probe method, Vibrating sample Magnetometer.

Books for Study and Reference

1. Evgenij Barsoukov and J. Ross Macdonald : Impedance Spectroscopy : Theory, Experiment and Applications, (John Wiley & Sons, Inc., Hoboken, New Jersey, second edition), 2005.
2. G. Cao: Nanostructures & Nanomaterials: Synthesis, Properties & Applications, (Imperial College Press), 2004.
3. Koch CC, Nanostructured Materials processing, properties and potential applications, Williams Andrew Publishing, Noyes, 2002
4. Pavia, Lampman, Kriz and Vyvyan, Spectroscopy, Cengage Learning India Pvt Ltd., 2011.
5. Willard, Merritt, Dean and Settle, Instrumental Methods of Analysis. CBS Publishers & Distributors, Delhi, 1986.
6. J.Ross Mcdonald, Impedance Spectroscopy Emphasizing solid materials and systems, John Wiley & sons, New York, 1996.
7. T. Pradeep, NANO: The Essentials, Tata Mc Graw-Hill Pvt. Ltd., New Delhi, 2007.
8. Charles P. Poole Jr & Frank J. Owens, Introduction to Nanotechnology, John Wiley & Sons (Asia) Pvt. Ltd., New Delhi, 2006.
9. Jackie Y.Ying, Nanostructured Materials, Academic Press, USA, 2001.

Paper – 3(c): SPACE PHYSICS

Preamble: To enlighten the students with the concepts of space physics. To make the students understanding the concepts of remote sensing of earth's climate system, space and plasma physics, space weather, introduction to magneto hydrodynamics, x-ray astronomy

Unit – I: Remote Sensing of Earth's Climate System (12 hrs)

Remote sensing of earth's climate system- requirements for remote sensing of climate system- methodology- constrains- basic concept of remote sensing- surface factors- atmospheric factors- instrumental factors- using reflected sunlight- global vegetation remote sensing- using thermal emission- global sea surface temperature measurement- radar altimetry- surface effects- atmospheric effects- ocean and ice monitoring by radar altimetry.

Unit - II: Space and Plasma Physics (12 hrs)

Basic plasma physics- principle- application- space plasma- the frozen in-flux-MHD plasma waves- solar wind and IMF- collision less shocks- bow shocks- shock jumps- shock structure- shock acceleration- magnetic reconnection- terrestrial magnetosphere- closed, open and flux transfer events- storms , sub storms- solar wind interaction with ionosphere- planets- insulator bodies(moon)- comets.

Unit – III: Space Weather (12 hrs)

Space weather- structure of sun- solar cycle- solar activity- coronal heating. The solar wind- wind- Aurora- Auroral sub storms- co-rotating interaction region(CIR)- solar flares- the ionosphere- solar energetic particle events(SEP)- coronal mass ejections(CME) and geomagnetic storms- Halo CME's- interplanetary CME's- magnetic clouds.

Unit - IV: Introduction to Magneto Hydrodynamics (12 Hrs)

Maxwell's equations in MHD- magnetic Reynold's number- Alfven speed- plasma beta parameter- force free magnetic field- magnetic buoyancy- magneto sttic equilibrium- magnetic reconnection- current sheet- acoustic waves- Alfven waves compressional Alfven waves- magneto acoustic waves- inertial waves.

Unit – V: X-Ray Astronomy (12 hrs)

Origin of X-rays astronomy- X-ray binaries- black hole- neutron stars- pulsars- white dwarfs- clusters of galaxies.

Books for Study and References

1. Thomas E Cravens, Physics of Solar System Plasma, (Cambridge University Press), 1997.
2. Thomas I Gombosi, Physics for Space Environment, (Cambridge University Press), 2004.
3. Louise K Hara and Keith O Mason, Space Science, (University of London, World Scientific Publishing Co.), 2004.
4. Margaret G Kivelson and Christopher T Russell, Introduction to Space Physics, (Cambridge University Press), 1995.

Paper – 3(d) : CRYSTAL GROWTH

Preamble: To introduce the knowledge on crystal growth and characterization. To expose the students with theories of nucleation & crystal growth, crystal growth from various techniques such as, solution, melt and vapour phase and their characterization.

Unit – I: Fundamentals of Crystal Growth (12 hrs)

Importance of crystal growth – Classification of crystal growth methods – Basic steps: Generation, transport and adsorption of growth reactants – Nucleation: Kinds of nucleation – Classical theory of nucleation: Gibbs Thomson equations for vapour and solution – Kinetic theory of nucleation – Becker and Doring concept on nucleation rate – Energy of formation of a spherical nucleus – Statistical theory on nucleation: Equilibrium concentration of critical nuclei, Free energy of formation.

Unit – II: Theories of Crystal Growth (12 hrs)

An introductory note to Surface energy theory, Diffusion theory and Adsorption layer theory – Concepts of Volmer theory, Bravais theory, Kossel theory and Stranski's treatment – Two-dimensional nucleation theory: Free energy of formation, Possible shapes and Rate of nucleation – Mononuclear, Polynuclear and Birth and Spread models – Modified Birth and Spread model – Crystal growth by mass transfer processes: Burton, Cabrera and Frank (BCF) bulk diffusion model, Surface diffusion growth theory.

Unit – III: Experimental Crystal Growth-Part-I: Melt Growth Techniques (12 hrs)

Basics of melt growth – Heat and mass transfer – Conservative growth processes: Bridgman-Stockbarger method – Czochralski pulling method – Kyropoulos method – Non-conservative processes: Zone-refining – Vertical and horizontal float zone methods – Skull melting method – Vernueil flame fusion method.

Unit – IV: Experimental Crystal Growth-Part-II: Solution Growth Techniques (12 hrs)

Growth from low temperature solutions: Selection of solvents and solubility – Meir's solubility diagram – Saturation and supersaturation – Metastable zone width – Growth by restricted evaporation of solvent, slow cooling of solution and temperature gradient methods – Crystal growth in Gel media: Chemical reaction and solubility reduction methods – Growth from high temperature solutions: Flux growth Principles of flux method – Choice of flux – Growth by slow evaporation and slow cooling methods – Hydrothermal growth method.

Unit – V: Experimental Crystal Growth-Part-III: Vapour Growth Techniques (12 hrs)

Basic principles – Physical Vapour Deposition (PVD): Vapour phase crystallization in a closed system – Gas flow crystallization – Chemical Vapour Deposition (CVD): Advantageous and disadvantageous – Growth by chemical vapour transport reaction: Transporting agents, Sealed capsule method, Open flow systems – Temperature variation method: Stationary temperature profile, Linearly time varying temperature profile and Oscillatory temperature profile.

Books for Study and Reference

1. 'Crystal Growth Processes' by J.C. Brice, 1986, John Wiley and Sons, New York.
2. 'Crystallization' by J.W. Mullin, 2004, Elsevier Butterworth-Heinemann, London.
3. 'Crystal Growth: Principles and Progress' by A.W. Vere, 1987, Plenum Press, New York.

4. 'Crystals: Growth, Morphology and Perfection' by Ichiro Sunagawa, 2005, Cambridge University Press, Cambridge.
5. 'Crystal Growth' by B.R. Pamplin, 1975, Pergamon Press, Oxford.

PAPER – 3 (e): Thin film

Preamble: To expose the students with knowledge of understanding the basic preparation and to get knowledge about the various properties of thin films. To make the understand the preparation and various necessary techniques used for analyzing the thin films

Unit- I: Preparation of Thin Films (12 hrs)

Spray pyrolytic process – characteristic feature of the spray pyrolytic process – ion plating – Vacuum evaporation – Evaporation theory – The construction and use of vapour sources – sputtering Methods of sputtering – Reactive sputtering – RF sputtering - DC planar m magnetron sputtering .

Unit - II: (Thickness Measurement and Nucleation and Growth in Thin Film (12 hrs)

Thickness measurement: electrical methods – optical interference methods – multiple beam interferometry – Fizeau – FECO methods – Quartz crystal thickness monitor. Theories of thin film nucleation – Four stages of film growth incorporation of defects during growth.

Unit - III: Electrical Properties of Metallic Thin Films (12 hrs)

Sources of resistivity in metallic conductors – sheet resistance - Temperature coefficient of resistance (TCR) – influence of thickness on resistivity – Hall effect and magneto resistance – Annealing – Agglomeration and oxidation.

Unit - IV: Transport Properties of Semiconducting and Insulating Films (12 hrs)

Semiconducting films ; Theoretical considerations - Experimental results – Photoconduction – Field effect thin films – transistors, Insulation films Dielectric properties – dielectric losses – Ohmic contacts – Metal – Insulator and Metal – metal contacts – DC and AC conduction mechanism

Unit - V: Optical Properties of Thin Films and Thin Films Solar Cells (12 hrs)

Thin films optics –Theory – Optical constants of thin films – Experimental techniques – Multilayer optical system – interference filters – Antireflection coating ,Thin films solar cells : Role, Progress , and production of thin solar cells – Photovoltaic parameter, Thin film silicon (Poly crystalline) solar cells : current status of bulk silicon solar cells – Fabrication technology – Photo voltaic performance : Emerging solar cells : GaAs and CuInSe.

Books for study and reference

1. Hand book of Thin films Technology: L I Maissel and R Clang .
2. Thin film Phenomena : K L Chopra .
3. Physics of thin films, vol. 12 , Ed George Hass and others .
4. Thin films solar cells – K L Chopra and S R Das .
5. Thin films processes – J L vilsan
6. vacuum deposition of thin films – L Holland .
7. The use of thin films in physical investigation – J C Anderson.
8. Thin films technology – Berry, Koil and Harri

PAPER – 3(f): ELECTRONIC STRUCTURE CALCULATION

Preamble: To introduce knowledge on electronic structure calculation. To make the students to understand basic concepts, various analysis on natural bond Orbitals, normal coordinates and different experimental methods

Unit – I: FTIR Raman Spectra (12 hrs)

Normal modes of vibration – Group frequencies – Origin of Infrared and Raman spectra – Infrared and Raman activity – IR and Raman spectral characteristics – FTIR and Raman spectra and their interpretation – Factors affecting Vibrational spectra - Hydrogen bonding – Structure elucidation using IR and Raman spectra – Resonance Raman scattering – Vibrational spectra of aromatic molecules

Unit – II: Quantum Chemical Computation (12 hrs)

Molecular Orbital Theory - Basis set – Electronic structure methods – Semi empirical methods – *Ab initio* methods - density functional theory methods - Z-matrix – geometry optimization – Harmonic Vibrational analysis – Atoms in molecules charges and Bond order – Potential energy surface – Mulliken population analysis – Vibrational circular dichroism intensities – Software: MOPAC, Gaussian

Unit – III: Natural Bond Orbital Analysis (12 hrs)

Natural bond orbitals and one-particle density matrix – Atomic eigenvectors – Natural atomic orbitals and natural population analysis – Bond eigenvectors – natural hybrids and natural bond orbitals – Natural localized molecular orbitals – Hyperconjugative interaction in NBO analysis.

Unit – IV: Normal Coordinate Analysis (12 hrs)

Classical theory of molecular vibrations – Construction of force constant matrix F – Internal coordinates in force field calculations – Theory of lattice vibrations – Scale factor calculation – Intensity calculation – Natural internal coordinates – MOLVIB software: General structure input data – Control parameters

Unit – V: Experimental Techniques (12 hrs)

IR spectrometer instrumentation – IR sources – Sample handling techniques – IR detectors – FTIR spectrometer – FTIR Raman spectrometer – Sample handling techniques – Laser exciting sources – Raman detectors – SERS techniques.

BOOKS FOR REFERENCE

1. Brain Smith, Infrared Spectral Interpretation – A Systematic Approach , CRC Press, New York, (1999)
2. G.Aruldas, Molecular structure and spectroscopy, prentice-Hall of India (P) Ltd., New Delhi-1110001, (2001).
3. G.Socrates, Infrared characteristic group frequencies, John Wiley & Sons, New York, (1980)
4. Ira N.Levine, Quantum chemistry V Ed., Prentice Hall International, Inc., London (2003).
5. Alan E. Reed et al., Chem. Rev. 88 (1988) 899-906.
6. Tom Sundius, MOLVIB User's guide Ver. 2, Helsinki (June 2002)
7. Robert M. Silverstein et al., Spectrometric identification of organic compounds, John Wiley & Sons, Inc., New York, (2003).

PAPER – 3(g) : NONLINEAR DYNAMICS

Preamble: To understand the basic concepts of nonlinear dynamics. This course provides knowledge about the effects of nonlinearity on dynamical systems

Unit – I: Nonlinearity, linear and nonlinear oscillators (12 hrs)

Dynamical systems - linear and nonlinear forces - Mathematical implications of nonlinearity - Working definition of nonlinearity - Effects of nonlinearity-Linear oscillators and predictability - Damped and driven nonlinear oscillators.

Unit – II: Equilibrium points, bifurcations and chaos (12 hrs)

Equilibrium points - General criteria for stability – Classification - Some simple bifurcations - Saddle node, pitch fork, transcritical and Hopf bifurcations - Discrete dynamical systems - Logistic map - Equilibrium points and their stability - period doubling phenomenon - chaos.

Unit – III: Chaos in nonlinear electronic circuits (12 hrs)

Linear and nonlinear circuit elements - nonlinear circuits - Chua's diode - Autonomous case - Bifurcations and chaos - Chaotic dynamics of MLC circuit-Analogue circuit simulation - Some other useful nonlinear circuit - Colpitt's oscillator.

Unit – IV: Fractals (12 hrs)

Self similarity - Properties and examples of fractals - Fractal dimension - Construction and properties of some fractals-Middle one third cantor set-Koch curve - Sierpinski triangle-Julia set - Mandelbrot set - Applications of fractals.

Unit – V: Solitons (12 hrs)

Linear waves - Linear non dispersive wave propagation - Linear dispersive wave propagation - Nonlinear dispersive systems - Korteweg de vries equation - solitary and cnoidal waves - Numerical experiments of Zabusky and Kruskal - birth of solitons - Properties of solitons - applications of solitons.

Book For Study:

Nonlinear dynamics, Integrability, Chaos, Patterns, M. Lakshmanan and S.Rajasekar, Springer, Berlin, 2003.

Books for Reference:

1. Chaos in nonlinear oscillator, controlling and synchronization, M.Lakshmanan and K.Murali (World Scientific, Singapor,1997.)
2. Deterministic chaos, H.G.Schuster, (Verlag,Weinheim,1998.)

PAPER – 3(h): MEDICAL PHYSICS

Preamble: To study the basic concepts of medical physics. To make the students to understanding the concepts of Physics in lungs and breathing, sound in medicine, light in medicine, physics of diagnostic X-rays and cardio vascular systems.

Unit - I: The Physics of the Lungs and Breathing (12 hrs)

The Airways– How the blood interact – Measurement of Lung Volumes – Pressure, Airflow, Volume Relationships of the Lungs – Physics of the Alveoli – The Breathing Mechanism – Airway Resistance – work of Breathing – Physics of some common Lung Diseases. Electricity within the Body: Electric signals – from the Heart (Electro Cardiogram) – From the Brain (Electro encephalogram) – From the Eye (Electro retinogram and electrooculogram) – Magnetic signals from Heart and Brain (Magnetocardiogram and Magnetoencephalogram) – Current Research involving electricity in the body.

Unit – II: Sound in Medicine (12 hrs)

General properties of sound, the body as a drum (percussion in medicine) – The stethoscope – ultrasound pictures of the body – ultrasound to measure motion – physiological effects of ultrasound in therapy – the production of speech – Physics of the ear and hearing : The outer ear – the middle ear – the inner ear – sensitivity of the ears – testing your hearing – deafness and hearing aids

Unit – III: Light in Medicine (12 hrs)

Measurement of light and its units – applications of visible light in medicine – applications of ultraviolet and infrared light in medicine – Lasers in Medicine applications of microscopes in medicine – Physics of eye and vision: Focusing elements of the eye – some other elements of the eye – the retina – the light detector of the eye – how sharp are your eye? Optical illusions and related phenomena – defective vision and its correction – colour vision and chromatic aberration – instruments used in ophthalmology.

Unit – IV: Physics of Diagnostic X-Rays (12 hrs)

Production of X-ray beam – how X-ray are absorbed – making an X-ray image – radiation to patients from X-rays – producing live X-ray images – fluoroscopy – X-ray slices of the body – radiographs taken without film Physics of Radiation Therapy: The dose units used in radiotherapy – the red and the gray – principles of radiation therapy – a short course in radiotherapy planning – megavoltage therapy – short distance radiotherapy or brachytherapy other radiation sources – closing thought of radiotherapy.

Unit – V: Physics of the Cardiovascular System (12 hrs)

Major Components of the Cardiovascular system – O₂ and CO₂ Exchange in the Capillary system – Work done by the Heart – Blood pressure and its measurement Transmural Pressure– Bernoulli's Principle – Blood flow – Heart Sounds – Cardiovascular Diseases – Functions of Blood Cardiovascular Instrumentation: Biopotentials of the Heart – Electrodes – Amplifiers – Patient Monitoring – Defibrillators – Pacemakers

BOOK FOR STUDY

Medical Physics–John R.Cameron & James G.Skofronick (John Wiley&Sons, New York1978)

PAPER – 3(i): RADIATION PHYSICS

Preamble: To teach the students about the basic concepts of radiation physics. To impart knowledge on radiation and interaction, principles of radiation detection and measurement, radiation therapy techniques, diagnostic radiology and radiation protection.

Unit-I: Radiation and Interactions (12 hrs)

Interaction of Electromagnetic radiation with matter – Photoelectric and Compton process – pair production – interaction of particles with matter – neutrons – heavy ions – nuclear reactions and production of radioisotopes – radiation sources – natural and artificial radio active for medical applications – Bethe- Bloch formula.

Unit – II: Principles of Radiation Detection and Measurement (12 hrs)

Radiation units and definitions – G.M. Counter – Scintillation detectors – Solid state detectors – Photofilm method - Pocket dosimeter – TLD - FBX dosimeters.

Unit – III: Radio Therapy Techniques (12 hrs)

Telegamma unit – accelerators for therapy – Iridium and cobalt needles – preparation of tracers and labeled compound – uses of radioisotopes (Gamma and beta) in brachytherapy. Dosimetry in medical applications – beta particles dose computation for biological models – dosimetry of internally administered isotopes Principles and overview of conformal radiotherapy, SRS, SRT and IMRT.

Unit – IV: Diagnostic Radiology (12 hrs)

The physical basis of diagnostic radiology – the diagnostic X-ray tube – electrical circuits – rating of the x-ray unit – factors on which quality and quantity of x-ray production depends – geometric factor which influences the radiographic image – fluoroscopy – tomography – radio isotopes in clinical medicine – rectilinear scanner – gamma camera.

Unit – V: Radiation Protection (12 hrs)

Philosophy behind radiation protection – basic concepts of MPD – recent ICRP recommendations – tissues at risk – risk factor – evaluation of internal and external radiation hazards – transport and waste disposal of radioactive materials.

REFERENCES

1. Meredith and Massay. "Fundamental Physics of Radiology", John Wright & Sons Jones M.E. and Cunningham J, "Physics of Radiology", Charles C. Thomas, USA, 1984.

2. Knoll, "Radiation Detection and Measurement", John Wiley and Sons, New York, 1982.
3. Mould R.F, "Radiation Protection", Adam Hilger's Boston, 1985.
4. Govindarajan K.N, "Advanced Medical Radiation Dosimetry", Prentice Hall of India, New Delhi, 1992

PAPER- 3(j) : ALTERNATIVE ENERGY CONVERSION DEVICES

Preamble: To introduce knowledge on alternative energy sources. To introduce the importance and overview of alternate energy sources. To make the students learn the basics of various energy conversion devices

Unit – I: Introduction and Overview of Alternative Energy Sources and Utilization (12 hrs)

Global energy budget – origins of fossil fuels – Principles of energy conversion: thermodynamic first and second laws – the Carnot cycle – Solar energy: Solar intensity and spectrum – global solar energy potential and current level of utilization – Photovoltaic: history – principles and theoretical limits – Solar cells and modules – semiconductor materials – single and multiple layer p-n junction diodes – Solar cells and modules – maximum power output – energy efficiency – quantum efficiency – Solar cells: characterization and modeling – Photovoltaic utilization.

Unit – II: Fundamentals of Electrochemistry and Electrode Kinetics (12 hrs)

Charge transfer reaction and reaction kinetics – Third-generation solar cells: dye-sensitized photocell – organic/polymer solar cell-Fuel cells: overview of types – basic operation and performance – Fuel cells: catalysis – Fuel cells: charge and mass transport – PEM fuel cells' Molten carbonate fuel cells – Solid oxide fuel cells – Overview of fuel cell systems: fuel-cell stack and thermal management.

Unit – III: Hydrogen as a Renewable Energy Source (12 hrs)

Sources of Hydrogen, Fuel cell – Principle of working – construction and applications – Fuel for Vehicles – Hydrogen Production: Direct electrolysis of water, thermal decomposition of water, biological and biochemical methods of hydrogen production – Storage of Hydrogen: Gaseous, Cryogenic and Metal hydride – Environmental impact.

Unit – IV: Batteries (12 hrs)

Primary and Secondary batteries - principles and application – Lithium batteries, Lithium ion and polymer batteries. Super-capacitors: principles and working, electrode materials synthesis process, fabrication of the devices and their applications.

Unit – V: Biomass Utilization (12 hrs)

Biodiesel and ethanol, Biomass utilization, Nuclear Energy: Potential of Nuclear Energy, International Nuclear Energy Policies and Regulations. Nuclear Energy Technologies – Fuel enrichment, Different Types of Nuclear Reactors, Nuclear Waste Disposal, and Nuclear Fusion.

REFERENCES:

1. Renewable Sources of Energy and Conversion Systems: N.K.Bansal and M.K.Kleman.
2. Principles of Thermal Process : Duffie -Beckman
3. Solar Energy Handbook: Kreith and Kreider (McGrawHill)
4. Solar Cell : Marteen A. Green
5. Solar Hydrogen Energy Systems -T. Ohta (Ed.) (Pergamon Press)
6. Hydrogen Technology for Energy – D.A.Maths (Noyes Data Corp.)
7. Handbook : Batteries and Fuel cell – Linden (Mc.Graw Hill)
8. Batteries Volume (I) and (II) – Collins
9. Fuel Cell Fundamentals :O'Hayre, Suk-Won Cha, Whitney Colella, and Fritz B. Prinz, 2nd ed, John Wiley & Sons, New York.
10. Energy Storage Materials: S.Selladurai Proceedings, 2010
11. Practical Photovoltaics: Electricity from Solar Cells, 3rd Ed.Richard J. Komp, Aatec Publications, Ann Arbor, MI, 2002

PAPER – 3(k) : LASERS AND APPLICATIONS

Preamble: To facilitates the students with theoretical aspects of laser theory and its applications. To provide the knowledge on laser theory, resonators and switching theory, gas & liquid lasers, solid state & semiconductor lasers and their applications.

Unit – I: Laser Theory (12 hrs)

Absorption - Spontaneous and stimulated emission - Einstein's coefficients - threshold conditions for laser action - Line broadening, Mechanism - Lorentzian and Doppler line shapes - Small signal gain - Gain coefficient - gain saturation - Rate equations for 3 and 4 level systems.

Unit – II: Resonators and Switching Theory (12 hrs)

Resonant cavity - Fox and Li - Boyd and Gorden's theory on resonators - modes - Spot size - Types of resonators - Mode selection - Q switching theory and technique - Mode locking theory and technique.

Unit – III: Gas and Liquid Lasers (12 hrs)

He-Ne, Argon Ion, Carbon dioxide, Nitrogen - Metal vapour - Gas dynamics - Excimer - Free electron lasers - Dye lasers organic dyes - Pulsed and CW dye lasers - Threshold conditions - Puming configurations.

Unit – IV: Solid State And Semiconductor Lasers (12 hrs)

Ruby, Nd : YAG, Nd : Glass, Ti-sapphire, Alexandrite, lasers - Semiconductor lasers - Homo function - Hetro function - Quantum well laser.

Unit – V: Applications (12 hrs)

Speckle, speckle interferometry - Holography - Holographic interferometry - Material processing - Surface treatment - welding, drilling - Laser ranging - Laser Doppler Velocimetry - Pollution monitoring - Medical applications.

REFERENCES

1. Laser Fundamentals, William T. Silfvast, Cambridge University Press, 1999.
2. Oshea, Callen and Rhcdes, "An Introduction to Lasers and their Applications", Addison Wesley, 1985.
3. A.Yariv, "Quantum Electronics", Third Edn., Addison-Wesley 1990.
4. Hariharan, "Optical Holography", Academic Press, New York, 1983.
5. Erf.R.K."Speckle Metrology", Academic Press, New York, 1978.

MANONMANIAM SUNDARANAR UNIVERSITY

M. Phil., Zoology

**M.S. University Affiliated Colleges-CBCS
With effect from the academic year 2018-19 onwards**

Sem.	Course Code	Title of the Paper	Credits	Contact Hours/week
I	MZO-1	Research and Teaching Methodology	4	4
I	MZO-2	Animal Biodiversity	4	4
I	MZOE3 (or) MZOE4	Elective 1- Animal Health (or) Elective 2– Applied Zoology	4	4
II	MZOP5	Project and Viva-voce	12	-
		Total	24	-

MZO-1: RESEARCH AND TEACHING METHODOLOGY

L	P	T	C
4	0	0	4

Course objective:

To provide in-depth Knowledge on methods involved in preparation of working solutions, quantitative and also on the working principles of equipments involved in research and teaching pattern.

Learning outcome:

- Know to significance and preparation protocol of solution and buffers for research work.
- Learn to know the principle and functions of advanced biological instruments and their applications.
- Acquired Knowledge on the histopathological and histochemical techniques.
- know the quantitative and qualitative estimation of biological macro and micro molecules.
- Learn to handle the computer aided statistical software packages.
- Enable to familiarize the methods of thesis writing and project proposal preparation.
- Inculcate the knowledge on the teaching and learning methods.

Unit I : Preparation of solutions :Types of Solutions- Standard Solutions, Stock Solution, Saturated Solution, Solution of Acids; Expression of Concentration - Molarity (M), Molality (m), Preparation of One Molar (1 M) Solutions, Normality (N), Mass Percent % (w/w), Percentage by Volume or % (v/v), Volume/Weight (V/W), Parts per Million (ppm), Parts per Billion (ppb); pH; Buffers and their preparation. -12h

Unit II: Microscopy and Microtechnique:Microscopy–Principle, working mechanism and applications of Light, Phase contrast, Fluorescent,Darkfield, SEM, TEM and STEM.Microtechnique–Preparation of Whole mount and sections, staining, mounting and preparation of permanent slides; Cyto and Histochemical techniques.-
-10h

Unit III: Quantitative and Molecular Techniques: Quantification of carbohydrate, protein, lipid, fatty acids and amino acids (Proximate composition); Estimation of Hydrolytic and Detoxication enzymes. Molecular Techniques – Principle, mechanism and application of SDS PAGE, AGE, PCR, RT-PCR; Basic principle and application of Chromatography; Basic principle and application of Spectrophotometer and UV Spectrophotometer. -14h

Unit IV: Biostatistics: Parametric – Student T test, F Test, Z – Test, Correlation, Regression and Co-efficient, ANOVA (One-way, Two-way), MANOVA, ANCOVA; Non-parametric – Chi-square, Wilcoxon signed rank test, Mann-Whitney test, Kolmogorov-Smirnow tests; SPSS, Sigma Plot, MAT LAB, and MiniTab for Biological data analysis. -12h

Unit V: Methodology of Teaching: Teaching-Objectives of Teaching, Phases of Teaching-Teaching methods: Lecture Method, Discussion method, Discovery learning, Inquiry, Problem Solving method, Project method, Seminar-Integrating ICT in teaching: Individualized instruction, ways for effective presentation with power point-Documentation-Evaluation: Formative, Summative and Continuous and

comprehensive evaluation-Later adolescent psychology: meaning, physical, cognitive, emotional, social and moral development-Teaching later adolescents. Manuscript, Thesis and Project writing. -12h

60h

Reference Books:

1. Rodney F. Boyer 2012. Biochemistry Laboratory: Modern Theory and techniques, second edition, Prentice Hall
2. Rajan Katoch. 2011. Analytical Techniques in Biochemistry and Molecular Biology, Springer, New York.
3. Chander,D.E. and Rtoberston, R.W.2009. Bioimaging: Current concepts in light and electron microscopy. Jones & Bartlet Publishers Jandberry M.A., USA.
4. Gurumani.2008. Text book of Research methodology.
5. Hoppert M.2003. Microscopic Techniques in Biotechnology. Wile and VCH,G Book & Co, Germany.
6. Sampath, K. Pannerselvam,A and Snathanam,S.1984. Introduction to educational technology(2nd Rebised edition), New Delhi: Sterling Publ.
7. Sharma, S.R.2003. Effective class room teaching modern methods, tools & techniques. Jaipur: Mangal Deep.
8. Vedanayagam, E.G.1989. Teaching technology for college teachers. New York: Sterling Publishers.

MZO-2: ANIMAL BIODIVERSITY

L	P	T	C
4	0	0	4

Course Objective : To provide knowledge on animal diversity, its significance in natural environmental and conservation strategies.

Learning Outcome:

- Understand the ecosystem, diversity of organisms and their ecological relationship.
- Know the genetic relationship of an animals their distribution and biological hotspot areas.
- Realize the importance of animal classification and taxonomy; species concept and their evolutionary significance.
- Inculcate conservation strategies of ecosystem and various enactments relating to conservation policy at national and international status.
- Learn the measurement of biodiversity richness, species evenness and geometric analysis.

- Unit I : **Basic concepts of Biodiversity:** Definition - Components of Biodiversity – Ecosystem – Genetic and Species diversity Species Concept – Patterns of Diversity (alpha, beta and gamma diversities) – Principles of Taxonomy: Animal diversity – Distribution, Population inventory – Biodiversity Hotspots – Mammals, Birds, Reptiles, Fishes and Invertebrates. -10h
- Unit II : **Identification of below ground faunal biodiversity:** meso- or meio- and macro faunal biodiversity and estimation of their diversity indices. Environmental pollution; global environmental change; biodiversity: status, monitoring and documentation; major drivers of biodiversity change; biodiversity management approaches. -10h
- Unit III : **Biological diversity :** Species richness gradient, levels of diversity – genetic, species and ecosystem diversity, patterns of diversity – alpha, beta and gamma diversities, diversity indices – Shannon, Simpson, Brillounin index, Jaccard index, Keystone species – predators, food source, Ecosystem modifies and ecosystem engineers, indicator species, endemism and hot spots – ecosystem services. -14h
- Unit IV : **Threats to biodiversity (Extinctions):** IUCN categories of threat, red data book, causes for biodiversity loss – habitat fragmentation, population reduction - Threats Status of Species Isolated species – Rate, Endemic and Threatened towards extinctions Wild species – Measurement – Organizations – UNEP, MoEF (India), NERI, NBA (India) – A brief account. -12h
- Unit V : **Conservation of biodiversity:** Principles of conservation, studies on conservation/management strategy - Environmental impact assessment (EIA)

– Remote sensing in EIA – *In situ* conservation (Project Tiger, biosphere reserves, national parks, wild life sanctuaries) and *Ex situ* conservation (Zoological and Botanical gardens, Cryopreservation, Tissue culture) – Tools in Conservation of wild life (statistics) and methods of interpretation wild life maps – Economics of biodiversity conservation. -14h

60h

Reference Books

1. Parker, T. F. and W. A. Haswell. 1921. Text Book of Zoology. Macmillan and Company Limited.
2. Simpson, G. G. 1961. Principle of animal taxonomy, Columbia University Press.
3. Avise, J.C. 1994. Molecular Markers, Natural History, and Evolution. Chapman and Hall, New York.
4. Odum, E. P. 1996. Fundamentals of Ecology, Nataraj Publishers, Dehradun.
5. Wilson, E. O. 1999. The Diversity of Life (The College Edition), W.W. Northern and Co.
6. Stiling, P. 2004. Ecology – Theories and Applications, Prentice Hall of India Pvt. Ltd. New Delhi, India.
7. Avise, J.C. 2008. Clonality: The Genetics, Ecology, and Evolution of Sexual Abstinence in Vertebrate Animals. Oxford Univ. Press, New York.
8. Hickman, P. C., Roberts, L.S., Keen, S.L., Larson, A. and D. Eisenhour. 2011. Animal Diversity. McGraw-Hill Higher Education.

MZOE3: ELECTIVE - ANIMAL HEALTH

L	P	T	C
4	0	0	4

Course Objective:

To provide knowledge on animal health, disease control, and related farm management practices.

Learning Outcome:

- Know the importance of animal nutrition, nutritional deficiency diseases and feed management.
- Learn the control and management of zoonotic organisms.
- Know the cattle/livestock management practices.

Unit I: Animals nutrition and Nutritional diseases: Animals nutrition- Nutritional importance of carbohydrates, lipids, proteins, vitamins, minerals and water- Nutritional deficiency diseases- Feeds and fodders, Scientific feeding of livestock, Feeding schedule for different categories of livestock and poultry- Feed additives- Silage making, Diet formulation for newborn, growing, pregnant, lactating and sick animals; Milking techniques and clean milk production- Sanitation and hygiene practices, Common health problems and their prevention. 14h-

Unit II: Zoonoses: Introduction to Zoonoses- Viral Zoonoses, Signs, symptoms, diagnosis and treatment of (Rabies, Japanese encephalitis, Dengue, SARS, Swine Influenza and Yellow fever)- Bacterial Zoonoses (Anthrax, Borreliosis, leptospiroses, plague, vibrioses, tuberculosis and Tetanus)- Rickettsioses (Scrub Typhus, Murine Typhus; Tick Typhus)- Parasitic Zoonoses (Toxoplasmosis, leishmaniases and Filariasis)- Fungal Zoonoses (Aspergillosis, Candidiasis, Histoplasmosis and blastomycosis)- Zoonoses associated with meat, fish and milk- Prevention and control measures of Zoonotic diseases. -14h

Unit III: Epidemiology: Principles of epidemiology, surveillance, forecasting and monitoring of diseases- Public health considerations of Disposal of cadaver and clinical waste- Guidelines for control of contagious diseases and infectious diseases, disease outbreaks- Prevention of cruelty to animals (CSPSCEA guidelines)- Introduction of Pharmacology, Nature and sources of drugs, Routes of drug administration, Dosage forms, Antiseptics and disinfectants- Handling of Hazardous substances. -12h

Unit IV :Poultry disease and Management: Chicken breeds, Duck breeds, Goose breeds and Turkey breeds- Poultry Nutrition- Diseases of poultry: Common poultry diseases, Different types of poultry diseases, Signs, symptoms, diagnosis and treatment of Bacterial, Viral, Parasitic diseases in poultry- Importance of water in poultry health- Integrated diseases prevention management in poultry- Epidemic threat from poultry farming- Epidemiology of Newcastle disease and economics of its control- Transmission, infection, pathogenesis and prevention of H5NI, Avian flu and Fowlpox- Flu vaccines- Probiotics in the Poultry industry. -10h

Unit V: Cattle Disease and Management: Dairy Breeds: Indigenous breeds of Cow, Buffalo, Goat and Sheep- Dairy products- Common Dairy diseases; Signs, symptoms, diagnosis and treatment of Bacterial, Viral, Fungal, Parasitic diseases in Dairy- Integrated diseases prevention management in Dairy- Epidemiology of Foot and mouth diseases- Anthrax disease, Bluetongue, Bovine ephemeral fever, transmission, infection, pathogenesis and prevention- Vaccines- Artificial insemination for Live stock improvement. -10h

60h

Reference Books:

1. Naresh Mahajan. 2014. Hand book of Poultry of Diseases. Random Publications, New Delhi.
2. Sumen kumara Joshi 2015.A text book of Zoonotic Diseases. Satish Serial publishing house,Delhi
3. Divyesh Pandey .2014. Poultry Husbandry. Random Publications, New Delhi.

(OR)

MZOE4: ELECTIVE – APPLIED ZOOLOGY

L	P	T	C
4	0	0	4

Course Objective: To provide knowledge on vermiculture techniques, harmful insects related to agriculture, infectious and communicable diseases, live stocks diseases and farming also on the significance and economic importance of sericulture and apiculture.

Learning outcome:

- Know the importance of productive insects and their conservation strategies.
- Learn the management and control of causative agents.

Unit I: Apiculture and Sericulture: APICULTURE: Types of honey bees, social organization, Life history of honey-bee, Bee keeping, Economic importance of honey bee, Bee Hive, Management of Bee Hive, Swarming, Pests and diseases. SERICULTURE: Silk moth, silk farming-cocoon processing-other farm of silk:-Tasar silk, Muga silk and Eri silk-Pests and Diseases in silkworm. -12h

Unit II: Agricultural Zoology: Beneficial Insects: Mantis-lady bird beetle-damsel fly-Predators-Parasitoids. Harmful Insects: Migratory locust, Rhinoceros beetle-Aphids-Economic Importance of rodents, snakes and bates. -10h

Unit III: Medical Zoology: Infectious and communicable diseases: Small box, AIDS, Influenza, Tuberculosis, Plaque, Cholera, Amoebiasis, Malaria, Dengue, Chicgunkunya, Trypanosomiasis and Elephantiasis. Vectors - definition, types of vector. Arthropod vector of medical importance. -12 h

Unit IV: Veterinary Zoology: Importance of live stock, cattle, goat, sheep and rabbit-live stock diseases: Anthrax, Ranikhet-Live stock parasites: Helminthes- Arthropod vector of veterinary importance – sand flies, mosquitoes, horse flies and Rat flea, ticks, mites and vector control. Dairy and Poultry farming. -12h

Unit V: Vermiculture: Vermiculture – definition, scope and importance. Exotic species of earthworm-Biology of *Eisenia fetida* & *Eudrilus eugeniae*-Taxonomy Anatomy, physiology and reproduction .Culture methods: indoors and out door; Monoculture and polyculture. Applications of Vermiculture /Vermiculture Bio-technology. Vermicomposting, Chemical composition of vermicastings. Use of Earthworms as feed/bait for capture/culture fisheries. Role of earthworms in agro-ecosystems Land reclamation and sustainable soil fertility; forest regeneration Earthworms for management of municipal/selected biomedical solid wastes. -14h

60h

Reference Books:

1. Edwards CA & Bater JE. 1977. Biology of Earthworms. Chapman & Hall.
2. Edwards CA. 1998. Earthworm Ecology. CRC Press.
3. Sultan Ahmed Ismail, 2005. The Earthworm Book, Second Revised Edition. Other India Press, Goa, India.
4. Shukla, G.S. and V.B. Upandhyya. 2017. Economic Zoology, 5th Edition. Rev. Edn. Rastogi Publ., Meerut.
5. Kotpal, R.L. 2000. Modern text of Zoology. Rastogi Publication.
6. Ashok Kumar, 2000. Text book of Animal Disease, Sonali Publication
7. Pradip, V. Jabde. 2005. Text book of Applied Zoology.
8. Ashok Kumar and Prem Mohan Nigam. 1991. Economic and Applied Entomology. Emjkay Publications, New Delhi.

SEMESTER-II: MZOP5-PROJECT WORK