St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	STATISTICS II
Course Code	**GAST21**
Class	I year(2014-2015)
Semester	Even
Staff Name	T Santhakumari
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- This is the second segment of a sequential course as a tool for solving problems in real life.
- The aim of this course is to enable the students to understand statistics.
- The course deals with analysis of variance- analysis of time series and statistical quality control.

Syllabus

Statistics-II
Text : Statistics, S. Arumugam and Others.
Unit I: 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 II: Statistical Quality Control-Definition, advantages, Process Control-Control Chart, Mean Chart, Range Chart, P-Chart, Product Control-Sampling Inspection Plans.

Unit III: 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 IV: 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 V: Analysis of Variance-One way and two way classified data-Basis of experimental design-Simple problems.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2014
1-L1	Unit-1 Index numbers introduction and price Relative method
2-L2	Solved examples on Aggregate and price relative method
3- L3	Weighted index number and weighted aggregative method with example
4-L4	Exercise problems of weighted average price relative method
5-L5	Exercise problems on index number
6-L6	Consumer price index numbers formulas
7-L7	Solved problems of consumer price index number
8-L8	Conversion of chain based index number into fixed base index with solved problems
9-L9	Exercise problems of conversion of index number
10-P1	**Inauguration of Mathematics Association**
11-L10	Exercise problems of conversion of index number
12-L11	Exercise problems of conversion of index number
13-L12	Unit-2 Statistical Quality control- definition
14-L13	Advantage, process control with examples
15-L14	Solved problems on statistical Quality control
16-L15	Exercise problems on statistical Quality control
17-L16	Exercise problems on statistical Quality control
18-L17	Control chart, mean chart, rang chart
19-L18	Solved problems on chart
20-L19	Exercise problems on chart
21-L20	Exercise problems on chart
22-L21	Production control definition with example
23-L22	Solved problem on production control- **Allotting portion for Internal Test-I**
	Internal Test I begins(19-01-2015)
24-L23	Solved problems on production control
25-L24	Exercise problems on production control
26-IT-1	**Internal Test-I**
27-L25	Exercise problems on production control
28-L26	Sampling inspection plan- introduction
29-L27	Solved problems on sampling inspection plan
30-L28	Exercise problems on sampling inspection plan- **Test Paper distribution**

	and result analysis
	Entering Internal Test-I Marks into University portal
31- L29	Exercise problems on sampling inspection plan
32- L30	Exercise problems on sampling inspection plan
33- L31	Unit-3 Tests of significance- sampling introduction
34-P2	**college level meeting/Cell function**
35- L32	Sampling distribution with example
36- L33	Testing of hypothesis- definition and errors in testing of hypothesis
37- L34	Procedure for testing of hypothesis and significance for large samples
38- L35	Difference of properties and solved problems on sampling
39- L36	Solved problems on tests on significances
40- L37	Solved problems on tests on significances
41- L38	Solved problems on tests on significances
42- L39	Exercise problems on tests on significance
43- L40	Exercise problems on tests on significance
44- L41	Test of significance for defence of sample means
45- L42	Solved problems on sample means
46- L43	Exercise problems on sample means
47- L44	Test for standard deviation
48- L45	Solved problems on standard deviation
49- L46	Exercise problems on standard deviation
50- L47	Test of significance for correlation coefficient
51- P3	**department Seminar**
52- L48	Solved problems and exercise
53- L49	Unit-4 Test of significance t–distribution
54- L50	Solved problems on t-distribution
55- L51	Solved problems on t-distribution
56-L52	Exercise problems on t-distribution - **Allotting portion for Internal Test-II**
	Internal Test II begins(16-02-2015)
57-L53	Exercise problems on t-distribution
58-L54	Exercise problems on t- distribution
59-IT-II	**Internal Test-II**
60- L55	Test of significance based on F-distribution
61- L56	Solved problems on F-distribution **-Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Exercise problems on F-distribution
63- L58	Exercises problems on F-distribution
64- L59	Exercise problems on F-distribution
65- L60	Test for significance sample correlation and solved problems
66- L61	Exercise problems on sample correlation
67- L62	Exercise problems on sample correlation
68- L63	Exercise problems on sample correlation
69- L64	Unit-5 Analysis of variance-Introduction
70- L65	One criterion of classification
71- L66	Solved problems on one criterion
72- L67	Solved problems on one criterion
73- L68	Solved problems on one criterion

74-P4	**College level meeting/ function**
75- L69	Exercise problems on one criterion
76- L70	Exercise problems on one criterion
77- L71	Two criteria of classification
78- L72	Solved problems on two criteria
79- L73	Solved problems on two criteria**Allotting portion for Internal Test-III**
	Internal Test III begins(16-03-2015)
80- L74	Exercise problems of two criteria
81- L75	There criteria of classification, Latin square
82-IT-III	**Internal Test-III**
83- L76	Solved problems of Latin square
84- L77	Solved problems of Latin square - **Test Paper distribution and result analysis**
85- L78	Exercise problems of Latin square
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test(16-04-2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course STATISTICS II
CO1	Outline basic principles in sampling also apply testing hypothesis on large samples at appropriate situations.
CO2	Apply testing hypothesis on small samples at appropriate situations.
CO3	Gain the knowledge on probability distributions.
CO4	Analyze various index numbers and formulate the procedure to measure the change in the variable over the period of time.
CO5	predict the future values based on previously observed values using concept of the time series
CO6	Evaluate the interdependency of two or more variables.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Number Theory
Course Code	**GMMA6A**
Class	III year (2014-2015)
Semester	Even
Staff Name	A.Alwyn Asir
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The study of number theory inevitably includes knowledge of the problems and techniques of elementary number theory, however the tools which have evolved to address such problems and their generalizations are both analytic and algebraic, and often intertwined in surprising ways.
- This course covers topics from classical number theory including discussions of mathematical induction, prime numbers, division algorithms, congruences, and quadratic reciprocity.

Syllabus

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 Chience Reminder Theorem.

(Chapter 4: Sections 4.2 to 4.4)

Unit 5: Fermat‘s Theorem-Wilson‘s Theorem.
(Chapter 5: Sections 5.2, 5.3)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 03-12-2014
1-L1	Unit – I Introduction
2-L2	Mathematical Induction
3- L3	Well Ordering Principle
4-L4	First principle of finite induction
5-L5	First principle problems
6-L6	First principle problems
7-L7	Bernoulli’s inequality
8-L8	Second principle of induction
9-L9	Lucas sequence
10-P1	**Inauguration of Mathematics Association**
11-L10	Second principle problems
12-L11	Pascal rule
13-L12	Newton’s identity
14-L13	Binomial theorem
15-L14	Cantalan number and Problems
16-L15	Pentagonal number
17-L16	Early Number Theory
18-L17	Unit – II Division Algorithm
19-L18	Division Algorithm related Corollary , Example
20-L19	Division Algorithm related problems
21-L20	Greatest Common Divisor – Definitions , Example , Note
22-L21	Greatest Common Divisor related Theorems , Corollary
23-L22	Relatively prime , Euclidean lemma - **Allotting portion for Internal Test-I**
	Internal Test I begins(19-01-2015)
24-L23	Mathematical Induction’s Problems
25-L24	Euclidean Algorithm and GCD problems
26-IT-1	**Internal Test-I**
27-L25	Least Common Multiple – Definitions , Theorems
28-L26	Least Common Multiple – Problems

29-L27	Diophantine equation – Definitions , Theorems
30-L28	Diophantine equations Corollary - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Diophantine equation's Examples
32- L30	Diophantine equation's Problems
33- L31	Divisions Algorithm's more problems
34-P2	**College level meeting/Cell function**
35- L32	Divisions Algorithm's problems
36- L33	Unit – III Primes and their distributions
37- L34	Composite number's definitions and theorems
38- L35	Corollary to the above theorems
39- L36	Fundamental theorem of Arithmetic
40- L37	Pythagoras theorem
41- L38	Pythagoras theorem related problems
42- L39	Pythagoras theorem related results
43- L40	The Sieve of Eratosthenes – Explanation
44- L41	The Sieve of Eratosthenes related problems
45- L42	Euclid theorem
46- L43	Euclidean number's definition and examples
47- L44	Euclidean number's theorems and result
48- L45	Euclidean number's corollary
49- L46	Repunit – Definition and Theorem
50- L47	Other two theorems on repunit
51- P3	**Department Seminar**
52- L48	Twin prime – Examples and Problems
53- L49	Unit – IV Theory of Congruence
54- L50	Definitions and Theorems on Congruence
55- L51	Properties for congruence
56-L52	Problems for congruence - **Allotting portion for Internal Test-II**
	Internal Test II begins(16-02-2015)
57-L53	Congruence related problems
58-L54	Binary and decimal representation of integers
59-IT-II	**Internal Test-II**
60- L55	Binary representation related problems
61- L56	Solution of congruence – Definitions and Corollary - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Decimal expansion's theorems and problems
63- L58	Polyndrome – Definitions and Problems
64- L59	Linear Congruence Theorem
65- L60	Problems on Linear Congruence
66- L61	Chinese Remainder Theorem
67- L62	Theorem on System of Linear Congruence
68- L63	System of Linear Congruence's problems
69- L64	System of Linear Congruence's problems
70- L65	Unit – V Fermat Theorem
71- L66	Corollary to Fermat Theorem
72- L67	Lemma to the above Corollary

73- L68	Wilson's Theorem
74-P4	**College level meeting/ function**
75- L69	Quadratic Congruence's Theorem
76- L70	Fermat – Kraitchik factorisation method
77- L71	Problems on Fermat's method
78- L72	Pseudoprime – Definition and Theorems
79- L73	Absolute Pseudoprime - Definitions **- Allotting portion for Internal Test-III**
	Internal Test III begins(16-03-2015)
80- L74	Absolute Pseudoprime – Notes
81- L75	Problems on Wilson's theorems
82-IT-III	**Internal Test-III**
83- L76	Problems on Wilson's theorem
84- L77	Problems on Fermat theorem - **Test Paper distribution and result analysis**
85- L78	Problems using Fermat theorem
	Entering Internal Test-III Marks into University portal **Model test beings (16-04-2015)**
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course Number Theory
CO1	Recall the basic concepts of divisibility.
CO2	Demonstrate renowned theorems in solving congruences.
CO3	Discuss on quadratic congruence equations.
CO4	Analyse various arithmetical functions.
CO5	Identify the numbers of special form and apply divisibility rules in solving Diophantine equations.
CO6	Have an in-depth knowledge in division algorithm, Euclidean algorithm and its applications.
CO7	Understand the concept of well-ordering principle and Archimedean property.
CO8	Acquire the basic properties of congruence.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Vector Calculus
Course Code	**GMMA21**
Class	II year (2014-2015)
Semester	Even
Staff Name	J. Suresh Suseela
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- This is a foundational course for any student aspiring to complete B. Sc degree in mathematics.
- The applicability of the subject is enormous in nature. The first unit is primarily devoted for the basics on vectors.

Syllabus

Major Paper- 3: Vector Calculus (75 hrs) Text:

Vector Analysis, P.Duraipandian and LaxmiDuraipandian, Emerald Publishers

Unit 1: Differentiation of vector functions-Gradient of a scalar point function

(Sections 1.1 to 2.5)

Unit 2: Divergence and curl of a vector point function.

(Sections 2.6 to 2.8)

Unit 3: Integration of point function-Line integrals-Surface integrals.

(Sections 3.1 to 3.5 and Problems 1 to 30 in section 3.8)

Unit 4: Volume integrals-Cylindericaland spherical polar coordinates-Gauss divergence theorem.

(Sections 3.6, 3.7 and problems 31 to 35 in Section 3.8. Sections 4.2, 4.3 and problems 1 to 21 in section 4.8)

Unit 5: Green's theorem in plane, Stoke's theorem, integral theoremOperational meaning of $\boldsymbol{\nabla}, \boldsymbol{\nabla} o, \boldsymbol{\nabla}\times$ in terms of surface integrals.

(Sections 4.4 to 4.7 and problems 22 to 44 in Section 4.8)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on03-12-2014
1-L1	Unit I Introduction to vectors
2-L2	Vector point functions
3- L3	Vector point functions
4-L4	Scalar point functions
5-L5	Scalar point functions
6-L6	problems
7-L7	dot product
8- P1	**Inauguration of Mathematics Association**
9- L8	cross product of vectors
10- L9	cross product of vectors
11-L10	product of three and four vectors
12-L11	geometrical interpretation of dot and cross product and their related aspects
13-L12	Derivative of a Vector & Derivative of sum of vectors
14-L13	Derivative of a Vector & Derivative of sum of vectors
15-L14	Derivative of product of a Scalar and Vector point function
16-L15	Derivative of product of a Scalar and Vector point function
17- L16	problems
18- L17	problems
19- L18	Gradient of a scalar point function
20- L19	Unit II Divergence
21- L20	Divergence- **Allotting portion for Internal Test-I**
	Internal Test I begins (19-01-2015)
22- L21	volume of parallelepiped
23- IT-1	**Internal Test-I**
24- L22	volume of parallelepiped
25- L23	tetrahedron
26- L24	tetrahedron - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Problem Discussions
28- L26	Problem Discussions

29- L27	Problem Discussions
30- P2	**College level meeting/Cell function**
31-L28	vector equationlines
32-L29	vector equationlines
33-L30	vector equationcircles
34- L31	Problem Discussions
35- L32	curl of a vector point function.
36- L33	curl of a vector point function.
37- L34	Unit III Integration of point function
38-L35	Line integrals
39- L36	Line integrals
40- L37	Surface integrals
41- L38	Laplacian operator
42-P3	**Department Seminar**
43- L39	Laplacian operator
44- L40	Limit of a vector function
45- L41	Limit of a vector function
46- L42	Differentiation of vector
47- L43	Differentiation of vector- **Allotting portion for Internal Test-II**
	Internal Test II begins (16-02-2015)
48- L44	Unit VI Volume integrals
49-IT-II	**Internal Test-II**
50-L45	Volume integrals
51- L46	Cylinderical- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Cylinderical
53- L48	Problem Discussions
54- L49	Problem Discussions
55- L50	Gauss divergence theorem.
56- L51	Gauss divergence theorem.
57- L52	spherical polar coordinates
58- L53	spherical polar coordinates
59-P4	**College level meeting/ function**
60- L54	Unit V Introduction
61- L55	Green's theorem in plane
62- L56	Green's theorem in plane
63- L57	Green's theorem in plane
64- L58	Gauss divergence theorem-**Allotting portion for Internal Test-III**
	Internal Test III begins (16-03-2015)
65- L59	Green's theorem in plane
66- L60	Stoke's theorem
67-IT-III	**Internal Test-III**
68- L61	Stoke's theorem
69- L62	Stoke's theorem
70- L63	integral theorem Operational meaning of $\boldsymbol{\nabla}, \boldsymbol{\nabla} o, \boldsymbol{\nabla}\times$ in terms of surface integrals. **-Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (16-04-2015)**

72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course Vector Calculus
CO1	Compute dot and cross products. Utilize these concepts to interpret geometrical properties of two or three dimensional objects
CO2	analyse the differentiability of the functions by defining gradient, divergent and curl.
CO3	Demonstrate the interdependency of gradient, divergent and curl by making use of relevant theorems.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Differntial equation and fourier series
Course Code	**GMMA22**
Class	I year (2014-2015)
Semester	Even
Staff Name	G.S.GracePrema V.Selvan
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- This course develops among the students, the mathematical skills required to study physics.

Syllabus

Differential Equations and Fourier Series (75 hrs)

Text: 1. Calculus (Volume III), S.Narayanan and T.K.Manicavachagom Pillay, S.Viswanathan (Printers Publishers) Pvt. Ltd**.**

Unit 1: First order but of higher degree differential equations-solvable for p, x, y-Clairaut's form**.**

(Chapter 1-Sections 5 to 7)

Unit 2: Linear differential equations of second order with constant coefficientsParticular integrals of functions of the form ax e , sinax, cosax, xn, ax e f(x) and xn f(x).

(Chapter 2-Sections 1 to 4)

Unit 3: Linear differential equation of second order with variable coefficientshomogeneous equations-equation reducible to homogeneous equations-method of variation of parameters**.**

(Chapter 2-Sections 8 to 10)

Unit 4: Laplace transforms-Inverse Laplace transforms-solving linear differential equations and simultaneous equations of first order using Laplace transforms.

(Chapter 5-Sections 1 to 9)

Unit 5: Fourier series-half range sine and cosine series**.**

(Chapter 6-Sections 1 to 6)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03-12-2014
1-L1	Unit-I Introduction
2-L2	Equations solvable for $\frac{dy}{dx}$
3- L3	Problems
4-L4	Equations solvable for y
5-L5	Equations solvable for x and problems
6-L6	Solving problems
7-L7	Clairault's form
8- P1	**Mathematics Association**
9- L8	Problems on Clairault's form
10- L9	Equations homogeneous in x and y
11-L10	Solving examples
12-L11	problems
13-L12	Solving exercise problems
14-L13	Solving exercise problems
15-L14	Unit –II Introduction
16-L15	Definitions – linear equation with constant coefficients
17- L16	Definitions – complementary function and the operator D
18- L17	Complementary function of a linear equation with constants coefficients
19- L18	Examples
20- L19	General method of finding particular integral
21- L20	Problems for particular integral in general method - **Allotting portion for Internal Test-I**
	Internal Test I begins (19-01-2015)
22- L21	Special methods for finding particular integral
23- IT-1	**Internal Test-I**
24- L22	Particular integrals of functions of the for the forme^{ax}
25- L23	Particular integrals of functions of the for the formsinax,cosax
26- L24	Particular integrals of functions of the for the formx^n - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Particular integrals of functions of the for the forme^{ax}f(x)
28- L26	Particular integrals of functions of the for the formx^n f(x)
29- L27	Unit-III Introduction – linear equation with variable coefficients

30- P2	**College level meeting/Cell function**
31-L28	Methods for transforming the linear equation with constant coefficients
32-L29	To find the particular integral
33-L30	Special method of evaluating the particular integral when x is of the formx^m
34- L31	Examples
35- L32	Solving exercise problems
36- L33	Equations reducible to the linear equations
37- L34	Solving examples
38- L35	Solving examples
39- L36	Solving exercise problems in equation reducible to homogenous equation
40- L37	Solving exercise problems in equation reducible to homogenous equation
41- L38	Method of variation of parameters
42-P3	**Department Seminar**
43- L39	**Unit-IV** Introduction
44- L40	The laplace transforms- definitions, operator
45- L41	Definitions piecewise continuity, exitence of the laplace transform
46- L42	Solving problems for laplace transform
47- L43	Inverse laplace transform- definitions , results- **Allotting portion for Internal Test-II**
	Internal Test II begins (16-02-2015)
48- L44	Results for inverse laplace transform
49-IT-II	**Internal Test-II**
50-L45	solving problems for inverse laplace transform
51- L46	solving problems for inverse laplace transform - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Exercise problems in inverse laplace transform
53- L48	Solution of differential equation using laplace transform
54- L49	Problems in solution of differential equation using laplace transform
55- L50	Solving simultaneous equation of first order using laplace transform
56- L51	Problems
57- L52	Unit-V Introduction
58- L53	Fourier series- half range
59-P4	**College level meeting/ function**
60- L54	Half range sine series
61- L55	Problems for fourier sine series
62- L56	Exercise problems for half range sine series
63- L57	Half range cosine series
64- L58	Solved problems for half range cosine series- **Allotting portion for Internal Test-III**
	Internal Test III begins(16-03-2015)
65- L59	Solved problems for half range cosine series
66- L60	Exercises problems for half range cosine series
67-IT-III	**Internal Test-III**
68- L61	Exercises for half range cosine series
69- L62	Exercises problems for half range sine series
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal

71-MT	**Model Test (16-04-2015)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course "DifferentialEquation and FourierSeries"
CO1	End of this course, the students should gain the knowledge about the method of solving Differential Equations.
CO2	Distinguish between linear, nonlinear, partial and ordinary differential equations and solve homogeneous, non homogeneous, linear and exact differential equations.
CO3	Solve second order differential equation with constant, variable and polynomial coefficients.
CO4	Classify and solve the partial differential equations of standard types.
CO5	Explain the relationship between Fourier series and linear time-invariant system.
CO6	Formulate recurrence relations for Legendre and Hermite differential equations.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Abstract Algebra
Course Code	**GMMA41**
Class	II year (2014-2015)
Semester	Even
Staff Name	J. Vijaya Xavier Parthipan
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- This is a basic course for any student aspiring to complete B.Sc., degree in Mathematics.
- The essence of mathematical logics and its ramifications in the study of mathematics is introduced.
- Basic properties of sets which are needed for the study of algebra are introduced.
- The students are exposed to the basic algebraic structure called group. Subsequently the properties of groups and imbedding a group in a bigger group called the group of symmetries are dealt with.
- The algebraic equivalence of any two groups is studied by means of isomorphism

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 03-12-2014
1-L1	UNIT-I Introduction on Relation
2-L2	Relation- definition and Examples
3- L3	Equivalence Relation
4-L4	Symmetric, reflexive, transitive
5-L5	Equivalence class- definition and Examples
6-L6	Equivalence Relation Theorems.
7-L7	Solved problems from Equivalence Relations
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Functions
10- L9	Types of Functions and Examples
11-L10	One-one, onto definition and Examples
12-L11	Restriction, composite definition and Examples
13-L12	Theorems on compositions
14-L13	Solved problems and Theorems from Bijection
15-L14	UNIT – II Permutation Groups
16-L15	Definition on symmetric group and order of G
17- L16	Cycle of length examples and note
18- L17	Theorems and examples from disjoint
19- L18	Theorems on permutation
20- L19	Theorems on even, odd permutation
21- L20	Introduction on Cyclic groups- **Allotting portion for Internal Test-I**
	Internal Test I begins(19-01-2015)
22- L21	Cyclic groups Theorems and Examples
23- IT-1	**Internal Test-I**
24- L22	Order of an element

25- L23	Theorems and corollary and Solved problems
26- L24	Cosets and Lagrange's Theorem- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Theorems about subgroups
28- L26	Examples and Solved problems
29- L27	UNIT – III Introduction on Normal subgroups and Quotient Groups
30- P2	**College level meeting/Cell function**
31-L28	Normal subgroups Theorems
32-L29	Some Solved problems on Normal subgroups
33-L30	Definition on Quotient Groups
34- L31	Introduction on Isomorphism and Isomorphic
35- L32	Theorems and Examples on Isomorphism
36- L33	Remark and Theorems on Isomorphism
37- L34	Solved problems on Isomorphism
38-L35	Cayley's Theorem
39- L36	Definition on automorphism, inner automorphism
40- L37	Note and Solved problems on automorphism
41- L38	Introduction on Homomorphism's
42-P3	**Department Seminar**
43- L39	Theorems on Homomorphism's
44- L40	Kernal 's on Theorems
45- L41	Fundamental Theorem of Homomorphism
46- L42	UNIT – IV Definitions and examples on Ring
47- L43	Elementary properties of rings- **Allotting portion for Internal Test-II**
	Internal Test II begins(16-02-2015)
48- L44	Note and Solved problems on rings
49-IT-II	**Internal Test-II**
50-L45	Isomorphism Definition and examples
51- L46	Types of rings- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Rings with identity- Definition
53- L48	Theorem on rings with identity
54- L49	Skew field
55- L50	Theorems and Solved problems on rings
56- L51	Characteristic of a rings
57- L52	Definition on Subrings
58- L53	Solved problems on Subrings
59-P4	**College level meeting/ function**
60- L54	Subfield - Theorems
61- L55	UNIT – V Introduction on Ideals
62- L56	Principal ideal generated by a ideal
63- L57	Theorems on ideal
64- L58	Principal ideal domain examples - **Allotting portion for Internal Test-III**
	Internal Test III begins(16-03-2015)
65- L59	Introduction on Quotient rings
66- L60	Quotient rings of R modulo I
67-IT-III	**Internal Test-III**
68- L61	Solved problems on Quotient rings

69- L62	Introduction on Maximal ideal
70- L63	Theorems on Maximal ideal - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test(16-04-2015)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	Prime ideal and corollary**Model test paper distribution and previous year university question paper discussion**
75-L65	The fundamental theorem of homomorphism -**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course Abstract Algebra
CO1	get familiar with group and its related topics
CO2	get a clear idea about homomorphism, isomorphism
CO3	have basic knowledge of ring and its related topics
CO4	get confidence to face any questions related with groups and rings
CO5	appreciate pure mathematics

\

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	COMPLEX ANALYSIS
Course Code	**GMMA61**
Class	III year (2014-2015)
Semester	Even
Staff Name	G.S.Grace Prema
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Complex analysis, traditionally known as the theory of functions of a complex variable, is the branch of mathematical analysis that investigates functions of complex numbers.
- It is useful in many branches of mathematics, including algebraic geometry, number theory, analytic combinatorics, applied mathematics; as well as in physics, including hydrodynamics and thermodynamics and also in engineering

Syllabus

Complex Analysis (90 Hrs)
Text: Complex Analysis by Dr.S.Arumugam and Others, Scitech Publications.

Unit 1: Complex numbers-nth 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- $f\,(cos\theta\ ,\ \sin\theta\ )d\theta$ only.

(Chapter 7: Sections 7.2, 7.4 and Chapter 8: Sections 8.1 to 8.3)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 03-12-2014
1-L1	UNIT-I Functions of a complex variable
2-L2	Definition of limits
3- L3	Definition of Conjugation and modulus
4-L4	Solved problems on conjugation and modulus
5-L5	Definition of Inequality
6-L6	Definition of Square root
7-L7	Solved problems on square root
8-L8	Definition of Geometrical Representation of complex number
9-L9	Polar form of a complex number
10-P1	**Inauguration of Mathematics Association**
11-L10	Definition of n^{th} roots of complex numbers.
12-L11	Exercise problems on Geometrical Representation of complex number
13-L12	Definition of Straight lines and Circle
14-L13	Regions in the complex plane
15-L14	Example of Regions in the complex plane
16-L15	The Extended complex plane
17-L16	Solved problems on The Extended complex plane
18-L17	UNIT-II Definition of Analytic functions
19-L18	Exercise problems on Analytic functions
20-L19	Limits and definition
21-L20	Examples of limits
22-L21	Theorems on limit
23-L22	Exercise problems on limits - **Allotting portion for Internal Test-I**
	Internal Test I begins(19-01-2015)
24-L23	Definition of Continuous functions
25-L24	Definition of Differentiability
26-IT-1	**Internal Test-I**
27-L25	Exercise problems on Differentiability
28-L26	Theorem of Cauchy- Riemann Equations

29-L27	Examples of Cauchy- Riemann Equations
30-L28	Alternate form of Cauchy- Riemann Equations - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Definition of Analytic functions
32- L30	Solved problems on Analytic functions
33- L31	Definition of Harmonic functions
34-P2	**College level meeting/Cell function**
35- L32	Milne-Thompson method
36- L33	UNIT-III Definition of Bilinear transformations
37- L34	Definition of Elementary transformations
38- L35	Solved problems on Elementary transformations
39- L36	Definition of Bilinear or Mobius transformation
40- L37	Theorems on Bilinear transformations
41- L38	Solved problems on Bilinear transformations
42- L39	Definition of Cross ratio
43- L40	Solved problems on Cross ratio
44- L41	Exercise problems on Cross ratio
45- L42	Fixed points of Bilinear transformations
46- L43	Theorems on Bilinear transformations
47- L44	Solved problems on Bilinear transformations
48- L45	Exercise problems on Bilinear transformations
49- L46	UNIT-IV Definition of Definite integral
50- L47	Definition of integral
51- P3	**Department Seminar**
52- L48	Solved problems on Definite integral
53- L49	Cauchy's theorem
54- L50	Definition of Cauchy's theorem
55- L51	Cauchy's theorem for multiply connected region
56-L52	Cauchy's integral formula- **Allotting portion for Internal Test-II**
	Internal Test II begins(16-02-2015)
57-L53	Maximum Modulus theorem
58-L54	Solved problems on Maximum Modulus
59-IT-II	**Internal Test-II**
60- L55	Definition of Higher derivatives
61- L56	Liouville's Theorem- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Solved problems on Higher derivatives
63- L58	Definition of Taylor's series
64- L59	Examples on Taylor's series
65- L60	Solved problems on Taylor's series
66- L61	Exercise problems on Taylor's series
67- L62	UNIT – V Definition of Laurent's series
68- L63	Laurent's theorem
69- L64	Solved problems on Laurent's series
70- L65	Definition of Singularities
71- L66	Examples of Singularities
72- L67	Theorem on Singularities

73- L68	Solved problems on Singularities
74-P4	**College level meeting/ function**
75- L69	Definition of Residues
76- L70	Solved problems on Residues
77- L71	Cauchy's Residue theorem
78- L72	Argument theorem
79- L73	Roche's theorem- **Allotting portion for Internal Test-III**
	Internal Test III begins(16-03-2015)
80- L74	Solved problems on Residues
81- L75	Evaluation of Definite integrals
82-IT-III	**Internal Test-III**
83- L76	Solved problems on Definite integrals
84- L77	Exercise problems on Definite integrals - **Test Paper distribution and result analysis**
85- L78	Exercise problems on Definite integrals
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (16-04-2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course Complex Analysis
CO1	Explain the geometry of complex numbers. Demonstrate bilinear transformation as composition of elementary transformations. Compile the relation between bilinear transformation and cross ratio.
CO2	Differentiate differentiability and analyticity. Characterize analytic function with Cauchy Riemann equations and further properties of partial derivatives.
CO3	Outline the procedure for integration of complex functions. Use Cauchy's integral formula and its consequences to prove most important theorems.
CO4	Compute power series expansion in connected region, annular region of an analytic function.
CO5	Identify different types of singularities and poles, calculate the residue. Use contour integration to find integrals of real valued functions of certain type.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	LINEAR PROGRAMMING
Course Code	**GMMA62**
Class	III year (2014-2015)
Semester	Even
Staff Name	J VIJAYA XAVIER PARITHIPAN
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- This course aims to develop students to use quantitative methods and techniques for effective decision making, mathematical model formulation and applications that are used in solving real life problems.

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03-12-2014
1-L1	Introduction of linear programming Problems
2-L2	Formation of linear programming problem.
3- L3	Solved problems in LPP.
4-L4	Exercise problem in LLPP.
5-L5	Mathematical formulation of a LPP.
6-L6	LPP in summation Notation and Matrix Form.
7-L7	Canonical form in Linear programming problem
8-L8	Remarks in LPP.
9-L9	Standard form of LPP.
10-P1	**Inauguration of Mathematics Association**
11-L10	Solved problems.
12-L11	Solved problems to find basic feasible solution.
13-L12	Theorems on basic feasible solutions.
14-L13	Theorems on basic feasible solutions.
15-L14	Notations and illustration of the problems
16-L15	Solved and exercise problems.
17-L16	Introduction of Graphical method.
18-L17	Non-negative constrains and constrains of the form ax_1+ax_2
19-L18	Optimizing objective function and its methods.
20-L19	Solved problems in Graphical method.
21-L20	Exercise problems in Graphical method.
22-L21	Introduction of Simplex method.
23-L22	Steps to solve simplex method. - **Allotting portion for Internal Test-I**
	Internal Test I begins(19-01-2015)

24-L23	Solved and exercise problems using simplex method.
25-L24	Problems based on unbounded solutions.
26-IT-1	**Internal Test-I**
27-L25	UNIT-II Introduction of Big M-method.
28-L26	Examples for the Big M- method.
29-L27	Algorithm for Big M- method.
30-L28	Solved problems in Big M- method. - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Exercise problems in Big M- method.
32- L30	Problems in Big M- method.
33- L31	Introduction to Two phase method
34-P2	**College level meeting/Cell function**
35- L32	Problems based on phase –I methods
36- L33	Problems based on phase – II methods.
37- L34	Exercise and Solved problems in 2-phase method.
38- L35	Applications of simplex method.
39- L36	Solution of simultaneous linear equations for simplex method.
40- L37	Problems based on it
41- L38	Inverting a non-singular matrix by simplex method
42- L39	Problems based on it.
43- L40	Introduction of Primal and dual.
44- L41	Lemma and remarks.
45- L42	Fundamental theorem of Duality.
46- L43	Algorithm of Dual Simplex method.
47- L44	Problems based on it.
48- L45	UNIT- III Introduction of Transportation problems.
49- L46	Mathematical formulation and Definition of TP
50- L47	Remark and Theorems in TP
51- P3	**Department Seminar**
52- L48	Dual of a Transportation problem.
53- L49	Solution algorithm for Transportation problem.
54- L50	Algorithm of North West Corner rule.
55- L51	Problems on North West Corner rule.
56-L52	Algorithm of Row Minima Method- **Allotting portion for Internal Test-II**
	Internal Test II begins(16-02-2015)
57-L53	Problems on Row Minima Method
58-L54	Algorithm of Column Minima Method
59-IT-II	**Internal Test-II**
60- L55	Problems on Column Minima Method
61- L56	Algorithm of Least Cost Method. - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems on least cost method.
63- L58	Algorithm of Vogel Approximation method.
64- L59	Problems on Vogel Approximation method.
65- L60	Determiningthe entering and leaving variable.
66- L61	Degeneracy in TP and MODI method.
67- L62	Problems based on MODI method.

68- L63	**UNIT-IV** Introduction of Assignment Problem
69- L64	Mathematical formulation and solution to assignment problem
70- L65	Hungarian Algorithm for solving Assignment problems
71- L66	Exercise and problems in Assignment problems
72- L67	Theorems and problems in Assignment problems
73- L68	UNIT-V Introduction to sequencing.
74-P4	**College level meeting/ function**
75- L69	Introduction of processing Jobs in 2 machine
76- L70	Algorithm and problems based on it.
77- L71	Introduction of processing n Jobs in m machine.
78- L72	Algorithm and problems based on it.
79- L73	Introduction of processing 2 jobs in ma machine-**Allotting portion for Internal Test-III**
	Internal Test III begins(16-03-2015)
80- L74	Introduction of Graphical method
81- L75	Algorithm on Graphical method
82-IT-III	**Internal Test-III**
83- L76	Problems on Graphical method
84- L77	Exercise and problems - **Test Paper distribution and result analysis**
85- L78	Exercise and problems on Graphical method.
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (16-04-2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course Linear Programming Problems
CO1	Enable the students to solve real life problems in Business Management.
CO2	Formulate Linear Programming Problem (LPP), find its solution by graphical method and identify the special cases of solution.
CO3	Predict solutions of different types of LPP using appropriate methods, namely, simplex, Big M and two-phase method.
CO4	Exploit the concept of dual simplex method and solve LPP.
CO5	Solve transportation and assignment problems using primal dual algorithm and extend it for special cases.
CO6	Propose the best strategy in a game using different decision making tools.
CO7	Demonstrate the use of simplex method in analyzing the sensitivity of the optimal solution in terms of change in the cost

	vectorrequirement vector/coefficient matrix/addition or deletion of variable.
CO8	Get interest in Management studies

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	MECHANICS
Course Code	**GMMA63**
Class	III year (2014-2015)
Semester	Even
Staff Name	T Stalin Alexis
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The course mainly deals with two major areas of applied mathematics namely Statics and Dynamics.
- Statics is the branch of mechanics that is concerned with the analysis of loads (force and torque, or "moment") acting on physical systems that do not experience an acceleration (a=0), but rather, are in static equilibrium with their environment.
- Whereas the dynamics is a branch of applied mathematics (specifically classical mechanics) concerned with the study of forces and torques and their effect on motion.
- Brief introduction to central forces to the learners becomes essential as we live in the era of satellites, missiles and space explorations.

Syllabus

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: Sections10.1, 10.2)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03-12-2014
1-L1	UNIT – I Introduction
2-L2	Forces acting at a point
3- L3	Parallelogram law of forces
4-L4	Exercise Problems 1,2
5-L5	Triangle of forces
6-L6	The polygon of forces
7-L7	Lami's theorem
8-L8	Exercise Problems
9-L9	Find the resultant of any number of coplanar places
10-P1	**Inauguration of Mathematics Association**
11-L10	Parallel forces & moments
12-L11	Unit of moment &Valigen's theorem
13-L12	Exercise problems 1,2
14-L13	Moment of a force about on axis
15-L14	Unit – II Equilibrium of forces
16-L15	Equilibrium of three forces acting on a rigid body
17-L16	Coplanar forces
18-L17	Trignometrical theorems
19-L18	Example problem 1 , 2
20-L19	Friction laws of friction
21-L20	Coefficient and Angle of friction

22-L21	Equilibrium of a particle on a inclined plane
23-L22	Equilibrium of a particle on a inclined plane under a parallel force **- Allotting portion for Internal Test-I**
	Internal Test I begins(19-01-2015)
24-L23	Equilibrium of a body on a inclined plane under any force
25-L24	Exercise problem 3, 4
26-IT-1	**Internal Test-I**
27-L25	Problems of parallel forces
28-L26	Unit – III Projectiles introduction
29-L27	Definitions and fundamental principles
30-L28	Show that the path of the projectile is parabola -**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Characteristics of the motion of the projectile
32- L30	Worked examples 1,2
33- L31	Determine the horizontal range of a projectile
34-P2	**College level meeting/Cell function**
35- L32	Velocity of the projectile at time t
36- L33	Example problem 40, 42
37- L34	Range on an inclined plane
38- L35	Range on an inclined plane is maximum
39- L36	Time of flight
40- L37	Greatest distance S of the projectile from the inclined plane
41- L38	Time taken to reach the greatest distance
42- L39	Initial velocity of projection
43- L40	Example problems 43, 44
44- L41	Enveloping parabola
45- L42	Exercise problems 1, 2
46- L43	Unit – IV Simple harmonic motion
47- L44	SHM in a straight line
48- L45	General solution of the SHM
49- L46	Geometrical representation of SHM
50- L47	Example problem 1, 2
51- P3	**Department Seminar**
52- L48	Composition of 2 SHM of the same period in a straight line
53- L49	Composition of 2 SHM of the same period in a directions
54- L50	Example problem 22, 23
55- L51	SHM on a curve
56-L52	Period of oscillation of a simple pendulum - **Allotting portion for Internal Test-II**
	Internal Test II begins(16-02-2015)
57-L53	Simple equivalent pendulum
58-L54	Seconds pendulum
59-IT-II	**Internal Test-II**
60- L55	Loss or gain of oscillation made by a pendulum
61- L56	Example problem 27, 28 **- Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal

62- L57	Unit – V motion under the action of central forces
63- L58	Velocity and acceleration in polar co-ordinates
64- L59	Example problem 1,2
65- L60	Differential equation of central orbit in polar co-ordinates
66- L61	Perpendicular from the pole on the tangent
67- L62	Pedal equation of the central orbit
68- L63	Pedal equation of standard curves
69- L64	Example problem 13, 14
70- L65	Velocities in a central orbit
71- L66	Two fold problems in central orbits
72- L67	Example problems 15, 16
73- L68	Apses and apsidal distance
74-P4	**College level meeting/ function**
75- L69	Law of the inverse square
76- L70	Example problems 34,35
77- L71	Law of the inverse principle
78- L72	SHM in a straight angle
79- L73	General solution of the SHM **Allotting portion for Internal Test-III**
	Internal Test III begins(16-03-2015)
80- L74	Geometrical representation of SHM law
81- L75	Apses and apsidal distance
82-IT-III	**Internal Test-III**
83- L76	Two fold problems in central orbits
84- L77	Solved problems - **Test Paper distribution and result analysis**
85- L78	Exercise problems
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (16-04-2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course Mechanics
CO1	Learners will gain knowledge about Mechanics of particle and Mechanics of a system of particles with constraints.
CO2	Acquisition of knowledge about D'Alembert's Principle, Lagrange's equation and Hamilton's Principle.
CO3	Outline basics that are governing system of forces.
CO4	explain the idea of couples and illustrate equilibrium of three forces acting on a rigid body in appropriate physical systems. .
CO5	Examine resultant of coplanar forces under various circumstances.

	Define and apply the concept of friction
CO6	Define principles of conservation of momentum and apply the concept of direct impact and oblique impact in collision of objects.
CO7	Describe the orbit of a moving particle under the action of central forces and compute moment of inertia.
CO8	Enable the students with the basic knowledge of equilibrium of a particle. Enable the students to develop a working knowledge to handle practical problems.
CO9	Knowledge gained about one-body problem, the virial theorem and the Kepler problem.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Graph Theory
Course Code	**GMMA64**
Class	III year (2014-2015)
Semester	Even
Staff Name	G.S.GRACE PREMA
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- A graph is a symbolic representation of a network and of its connectivity.
- It implies an abstraction of the reality so it can be simplified as a set of linked nodes.
- Graph theory is a branch of mathematics concerned about how networks can be encoded and their properties measured.
- It has been enriched in the last decades by growing influences from studies of social and complex networks.
- The origins of graph theory can be traced to Leonhard Euler who devised in 1735 a problem that came to be known as the "Seven Bridges of Konigsberg".

Syllabus

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: Sections10.1, 10.2)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 03-12-2014
1-L1	Unit-1 Introduction
2-L2	Definitions and examples of Graph
3- L3	Degrees
4-L4	Problems
5-L5	Sub graphs
6-L6	Spanning sub graph
7-L7	Definitions and examples of spanning sub graph
8-L8	Isomorphism
9-L9	Definitions of automorphism and remark
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Ulam's conjecture and problems
12-L11	Ramsey numbers
13-L12	Problems of Ramsey number
14-L13	Independent sets and coverings
15-L14	Intersection graphs and line graphs
16-L15	Matrices
17-L16	Operations on graphs
18-L17	Unit-2 Degree sequence
19-L18	Examples and problems
20-L19	Graphic sequences
21-L20	Definition and theorem
22-L21	Algorithm and theorem
23-L22	Definition- walk, trails and paths- **Allotting portion for Internal Test-I**
	Internal Test I begins(19-01-2015)
24-L23	Length of the walk and examples
25-L24	Theorems
26-IT-1	**Internal Test-I**
27-L25	Connected- definition and examples

28-L26	Connectedness related theorems
29-L27	Bipartite-Definition and theorems
30-L28	Definition of cut point, disconnected graph, Bridge - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Blocks- Definitions related examples
32- L30	Theorems on Blocks
33- L31	Definition of connectivity and examples
34-P2	**College level meeting/Cell function**
35- L32	Definition of n-connected, n-line connected
36- L33	Problems related k-connected graph
37- L34	Problems in k-connected graph
38- L35	Problems in k-connected graph
39- L36	Book back one words
40- L37	Unit-3 Introduction
41- L38	Definition of Eulerian and lemma
42- L39	Eulerian related theorem and corollary
43- L40	Fleury's algorithm
44-L41	Definition – Hamiltonian cycle
45- L42	Hamiltonian graph and examples
46- L43	Definition-theta graph and theorems
47- L44	Theorem –Necessary condition for a graph to be Hamiltonian
48- L45	Dirac 's theorem
49- L46	Problems for non-Hamiltonian
50- L47	Definition-Acyclic graph, Tree, examples
51- P3	**Department Seminar**
52- L48	Theorems related to tree
53- L49	Definition – spanning tree and theorem
54- L50	Definition- Eccentricity, radius r(G), examples
55- L51	Definitions-centres of G, and theorems
56-L52	Book back one word- **Allotting portion for Internal Test-II**
	Internal Test II begins (16-02-2015)
57-L53	Unit-4 Definition- planarity and example
58-L54	Definition – Non planar and theorem
59-IT-II	**Internal Test-II**
60- L55	Theorems related to embedding plane
61- L56	Theorems-Euler's polyhedron formula- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Corollary related to plane graph
63- L58	Definition- Maximal planar, corollary
64- L59	Definition- Elementary subdivision, Homeomorphic and examples
65- L60	Problems related to homeomorphic
66- L61	Definition- Colourability, example, chromatic numb
67- L62	Definition- Chromatic partitioning, examples
68- L63	Definition- uniquely colourable, theorems
69- L64	Definition- Edge colouring, Edge chromatic number
70- L65	Theorem related to edge chromatic number

71- L66	Unit-5 Five Colour theorem
72- L67	Chromatic polynomials , theorem
73- L68	Problems related to chromatic polynomial
74-P4	**College level meeting/function**
75- L69	Definition- Directed graph, Indegree
76- L70	Definition- Isomorphism and Directed walk
77- L71	Examples
78- L72	Definitions- length, directed cycle
79- L73	Definitions- **Allotting portion for Internal Test-III**
	Internal Test III begins (16-03-2015)
80- L74	Definitions- reachable, unilateral
81- L75	Definition- Strongly connected and theorem
82-IT-III	**Internal Test-III**
83- L76	Definition- Eulerian trail, Eulerian
84- L77	Theorem related to Eulerian - **Test Paper distribution and result analysis**
85- L78	Theorem related to Eulerian
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (16-04-2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course Graph Theory
CO1	Demonstrate graphs with examples and represent a graph by matrices.
CO2	Identify and construct Eulerian and Hamiltonian graphs.
CO3	Describe the properties of trees and able to examine minimal spanning tree for a given weighted graph.
CO4	discuss colouring concept of vertices and edges of a graph
CO5	Analyze planar graphs and its properties, and classify the connectedness of directed graph.
CO6	Gain the skills to apply the theory to solve various mathematical problems.
CO7	Have an in-depth knowledge of colouring and planarity.
CO8	Know the methods of representing networks in computer science and other fields.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature　　　　　　　　　　　　　　　　　　　　Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	NUMERICAL METHODS
Course Code	**GSMA3A**
Class	II year (2014-2015)
Semester	Even
Staff Name	A. Alwyn Asir
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- The aim of this course is to enable the students to acquire basic tools in numerical methods for solving real life problems in business, industry, agriculture and medicine**.**

Syllabus

Numerical Methods

Text: Numerical Analysis by Dr.S.Arumugam and Isac.

Unit 1: Simultaneous equations-back subsititution-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 operatos-Other difference operators-Newton's interpolation-Central Difference Interpolation formula.

(Chapter 3: Section3.1, 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 50)

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)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2014
1-L1	UNIT-I Introduction on Simultaneous equations
2-L2	Notes on Simultaneous equations
3- L3	Introduction on Back substitution method
4-L4	Introduction on Gauss Elimination method
5-L5	Gauss – Jordan Elimination method
6-L6	Problems on Gauss Elimination method
7-L7	Problems on Gauss – Jordan Elimination method
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Calculation of inverse of a matrix
10- L9	Gauss – Seidal Iteration method
11-L10	Problems on Gauss – Seidal Iteration method
12-L11	UNIT-II Introduction on Difference operators
13-L12	Properties of the operator Δ
14-L13	Introduction on Forward and Backward differences
15-L14	Introduction on Central differences operator - **Allotting portion for Internal Test-I**
	Internal Test I begins(19-01-2015)
16-L15	Problems on Forward, Backward Central differences
17-IT-1	**Internal Test-I**
18-L16	Other difference operators- Theorems and operators
19-L17	Newton’s Forward and Backward Interpolation formula. - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Gauss Forward and Backward Interpolation formula.
21- L19	Stirling’s formula and Problems
22- P2	**College level meeting/Cell function**
23-L20	UNIT-III Lagrange’s interpolation formula
24-L21	Problems on Lagrange’s interpolation formula
25-L22	Divided difference derivation and example
26-L23	Relation between Divided difference and forward difference
27-L24	Problems using Divided difference formula
28-L25	Newton’s Divided difference formula
29-L26	Problems using Newton’s Divided difference formula
30-L27	Inverse interpolation - Lagrange’s method
31-L28	Introduction on Iterative method
32-L29	Problems on Iterative method

33-L30	UNIT-IV Introduction on Numerical differentiation
34- P3	**Department Seminar**
35-L31	Derivatives using Newton's forward difference formula
36-L32	Derivatives using Newton's backward difference formula - **Allotting portion for Internal Test-II**
	Internal Test II begins(16-02-2015)
37- L33	Derivatives using Stirling's formula
38- IT-II	**Internal Test-II**
39-L34	Introduction on Maxima and minima of the interpolation polynomial
40-L35	Problems using Newton's forward difference formula - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Problems using Newton's backward difference formula
42- L37	Stirling's formula derivative Problems
43- L38	Maxima and minima Problems
44- P4	**College level meeting/ function**
45-L39	Maxima and minima Problem
46-L40	UNIT-V Introduction
47-L41	Numerical Integration introduction
48-L42	Newton's cote's quadrature formula
49-L43	Trapezoidal rule derivation and Geometrical representation
50-L44	Simpson's one – third rule - **Allotting portion for Internal Test-III**
	Internal Test III begins(16-03-2015)
51 L45	Simpson's three – eight rule
52- L46	Error's in Trapezoidal and Simpson's rule
53-IT-III	**Internal Test-III**
54-L47	Problems using Trapezoidal and Simpson's rule
55-L48	Problems using Simpson's three – eight rule - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test (16-04-2015)**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course “Numerical methods “
CO1	Demonstrate various numerical methods and use them to solve algebraic, transcendental and system of linear equations.
CO2	Identify interpolations on equal/unequal intervals and solve relevant problems using appropriate methods.
CO3	Use numerical methods with various mathematical operations such as differentiation and integration
CO4	Demonstrate to obtain measures of central tendencies /dispersion with examples.
CO5	Apply the basic probability rules to solve problems and calculate correlations.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Statistics I
Course Code	**GAST11**
Class	I year (2014-2015)
Semester	Odd
Staff Name	T Santhakumari V.Selvan
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The objective of the course is to enable the students to understand the theoretical background of statistics as a student of Mathematics.
- The course essentially deals with the probability distribution theory which is the basis of statistics.
- The topics covered includes Correlation and Regression and curve fitting

Syllabus

Statistics-I

Text : Statistics, S. Arumugam and Others.
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, Regression, Regression coefficientand properties-Rank correlation.

Unit III: Association of attributes, Consistency of data-Criteria for independence-Yule's coefficient of association.

Unit IV:Discrete Probability Distributions:
Geometric, Binomial and Poisson distributions-Their moments, generating function, Characteristic function, Properties and simple application.

Unit V:Continuous Probability Distributions:
Beta 1 and Beta 2 and Gamma distributions-Normal Distribution-Standard Normal Distribution-Their Properties-Simple Problems-Importance of Normal Distribution.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2014
1-L1	Unit-1 Moments skewness and Kurtosis :Definitions and theorems
2-L2	Skewness and Kurtosis – Basic definitions
3- L3	Solved problems of skewness and kurtosis
4-L4	Exercise problems of skewness and kurtosis
5-L5	Exercise problems of skewness and kurtosis
6-L6	Exercise problems of skewness and kurtosis
7-L7	Curve fitting- Principles of least square, Fitting straight line and second degree parabola
8-L8	Solved problems of curve fitting
9-L9	Exercise problems of curve fitting
10-P1	**Inauguration of Mathematics Association**
11-L10	Exercise problems of curve fitting
12-L11	Unit-2 Correlation and Regression Definitions and Examples
13-L12	Theorems of correlation and regression
14-L13	Notes and Solved problems of correlation and regression
15-L14	Solved problems of correlation and regression
16-L15	Exercise problems of correlation and regression
17-L16	Exercise problems of correlation and regression
18-L17	Rank correlation: Theorem and some notes
19-L18	Solved problems of rank correlation
20-L19	Exercise problems of rank correlation
21-L20	Exercise problems of rank correlation
22-L21	Exercise problems of rank correlation
23-L22	Regression: Definitions and theorems - **Allotting portion for Internal Test-I**
	Internal Test I begins (30.07.2014)
24-L23	Coefficient for a Theorems and notes
25-L24	Solved problems of regression
26-IT-1	**Internal Test-I**
27-L25	Solved problems of regression
28-L26	Exercise problems of regression
29-L27	Exercise problems of regression

30-L28	Exercise problems of regression - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Correlation coefficient for a Bivariate frequency distribution: Definitions
32- L30	Solved problems of correlation coefficient
33- L31	Solved problems of correlation coefficient
34-P2	**College level meeting/Cell function**
35- L32	Exercise problems of correlation coefficient
36- L33	Exercise problems of correlation coefficient
37- L34	Unit-3 Theory of Attributes: Definition and notes
38- L35	Theorem notes and Examples
39- L36	Solved problems of Attributes
40- L37	Solved problems of Attributes
41- L38	Exercise problems on Attributes
42- L39	Exercise problems on Attributes
43- L40	Exercise problems on Attributes
44- L41	Consistency of Data: Definition and Notes
45- L42	Solved problems of consistency of Data
46- L43	Solved problems of consistency of Data
47- L44	Exercise problems of consistency of Data
48- L45	Exercise problems of consistency of Data
49- L46	Exercise problems of consistency of Data
50- L47	Independence and association of Data: Introduction, Notation
51- P3	**Department Seminar**
52- L48	Notes and Solved problems of Association of Data
53- L49	Solved problems of Association of Data
54- L50	Exercise problems of Association of Data
55- L51	Exercise problems of Association of Data
56-L52	Exercise problems of Association of Data-**Allotting portion for Internal Test-II**
	Internal Test II begins (18.08.2014)
57-L53	Exercise problems of Association of Data
58-L54	Exercise problems of Association of Data
59-IT-II	**Internal Test-II**
60- L55	Unit-4 Binomial Distribution: Definitions and notes
61- L56	Binomial distribution theorems - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorems on Binomial Distribution
63- L58	Solved problems of Binomial Distribution
64- L59	Solved problems of Binomial Distribution
65- L60	Poisson Distribution: Definition and notes and theorem
66- L61	Solved problems of Poisson distribution
67- L62	Exercise problems of Poisson distribution
68- L63	Exercise problems of Poisson distribution
69- L64	Moment generating functions: Definition, notes and examples
70- L65	Some properties of generating function
71- L66	Solved problems on generating functions
72- L67	Exercise problems on generating functions
73- L68	Exercise problems on generating functions

74-P4	**College level meeting/ function**
75- L69	Characteristic function: Properties and Exercise problems
76- L70	Unit-5 Beta 1,2 and Gamma distribution Introduction
77- L71	Normal distribution: Mean variance and Notes
78- L72	Moments about mean of Normal Distribution
79- L73	Properties of Normal Distribution- **Allotting portion for Internal Test-III**
	Internal Test III begins (15.10.2014)
80- L74	Importance of Normal Distribution
81- L75	Solved problems of Normal Distribution
82-IT-III	**Internal Test-III**
83- L76	Solved problems of Normal Distribution
84- L77	Exercise problems of Normal Distribution- **Test Paper distribution and result analysis**
85- L78	Exercise problems of Normal Distribution
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 24.10.2014**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31.10.2014

Course Outcomes

Learning Outcomes	**COs** of the course Statistics I
CO1	Demonstrate with example a sample space. Outline the role of probability density function in determining the nature of probability
CO2	Apply the moment generating function to determine moments and the relation to mean, standard deviation and variance. Measure the dispersion of the data of any distribution by chebychev's inequality.
CO3	Identify and apply various distributions to solve problems.
CO4	Evaluate the relation between different data.
CO5	Fit the appropriate curve using the methods of least squares.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Combinatorial Mathematics
Course Code	**GMMA5B**
Class	IIIyear (2014-2015)
Semester	Odd
Staff Name	G.S.GRACE PREMA G.JEYA KUMAR
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Combinatorics is a branch of mathematics concerning the study of finite or countable discrete structures.
- Aspects of combinatorics include counting the structures of a given kind and size (enumerative combinatorics), deciding when certain criteria can be met, and constructing and analyzing objects meeting the criteria.
- Many combinatorial questions have historically been considered in isolation, giving an adhoc solution to a problem arising in some mathematical context.
- In the later twentieth century, however, powerful and general theoretical methods were developed, making combinatorics into an independent branch of mathematics in its own right. Combinatorics is used frequently in computer science to obtain formulas and estimates in the analysis of algorithms

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2014
1-L1	Unit-1 Introduction
2-L2	Definition for colourings and examples
3- L3	Theorem for colouring
4-L4	Recurrence relation- definitions, examples and problems
5-L5	Permutation-Definition, Theorems
6-L6	Permutation related problems
7-L7	Definition for p(n,r) and problems
8-L8	Combination definition
9-L9	Combination related theorems and problems
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Pascal’s identity theorem
12-L11	Problems for Binomial theorem
13-L12	Exponential-Definition and theorem
14-L13	Problems on permutation
15-L14	Exercise problems of permutation
16-L15	Unit-2 Pairings definitions and examples
17-L16	Definition- vertices, edges, graph and example
18-L17	Perfect matching definitions
19-L18	Perfect matching examples
20-L19	Perfect matching Theorem
21-L20	Pairing between sets
22-L21	Hall’s theorem on distinct representation or Assignment of Marriage theorem
23-L22	Latin square-Definitions and examples- **Allotting portion for Internal Test-I**
	Internal Test I begins(30-07-2014)
24-L23	Problems on Latin squares
25-L24	Latin rectangle-Definitions and examples
26-IT-1	**Internal Test-I**

27-L25	Hungarian Algorithm for solving assignment
28-L26	Assignment problems
29-L27	Balanced Assignment problems
30-L28	Unbalanced Assignment problem-**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Unbalanced Assignment problems
32- L30	Travelling salesman problem
33- L31	Travelling salesman problems
34-P2	**College level meeting/Cell function**
35- L32	Unit-3 Recurrence relation- Definition and examples
36- L33	Solving the recurrence relation
37- L34	Problems on recurrence relation
38- L35	Problems on recurrence relation
39- L36	Problems on recurrence relation
40- L37	Derivation of Fibonacci relation
41- L38	The problems of derangements-Definitions and problems
42- L39	Another formulation for derangement
43- L40	Partition of an integer, tree-Definitions and examples
44- L41	Degree of vertex, simple tree, rooted simple tree-definitions and examples
45- L42	Rooted simple tree's problems
46- L43	The generating function for rooted simple tree
47- L44	Problems on generating function for rooted simple tree
48- L45	Possible number of colouring problems
49- L46	Unit-4 The inclusion- exclusion principle
50- L47	Theorem for $\lvert A \cup B \cup c \rvert \, and \lvert A \cup B \cup C \cup D \rvert$
51- P3	**Department Seminar**
52- L48	Problems on inclusion –exclusion principle
53- L49	Problems on inclusion-exclusion principle
54- L50	Rook Polynomial-definition
55- L51	Rook polynomial problems
56-L52	Rook polynomial problems- **Allotting portion for Internal Test-II**
	Internal Test II begins(18-08-2014)
57-L53	Rook polynomial for 4x4 board and 8x8 board
58-L54	Non-interfering definitions and theorem
59-IT-II	**Internal Test-II**
60- L55	Another theorem of non-interfering
61- L56	Rook polynomial problems- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems on Rook polynomial
63- L58	Rook polynomial for 6x6 Latin square
64- L59	Rook polynomial for5x5 Latin square
65- L60	Problems on Rook polynomial
66- L61	Problems on Rook polynomial
67- L62	problems on Rook polynomial
68- L63	Unit-5 Block designs, Block -definition
69- L64	Matrix representation for Block designs
70- L65	Properties of the incident matrix
71- L66	Incident matrix problem

72- L67	Incident matrix problem
73- L68	Block design related theorem
74-P4	College level meeting/ function
75- L69	Properties of 7 point plane
76- L70	Incident matrix problem
77- L71	Fisher's theorem
78- L72	Note for incidence matrix
79- L73	Square Block design –Definition, properties and theorem - **Allotting portion for Internal Test-III**
	Internal Test III begins(15-09-2014)
80- L74	Theorem for square block design
81- L75	Finite projective plane definition and notes
82-IT-III	Internal Test-III
83- L76	Properties of finite projective plane
84- L77	Finite projective place related lemmas and theorem - **Test Paper distribution and result analysis**
85- L78	Hadamard matrix- definitions and examples
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test(24-10-2014)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-10-2014

Course Outcomes

Learning Outcomes	**COs** of the course Combinatorial Mathematics
CO1	Demonstrate effectively the addition and multiplication principles and use it for counting.
CO2	Use generating functions and the concept of partition to solve combinatorial problems.
CO3	Model recurrence relations using different techniques for real time counting problems and find solutions.
CO4	Outline special counting numbers such as Fibonacci number, Stirling numbers, catalan number and Menage number.
CO5	Design a new counting principle called inclusion and exclusion principle and use it for counting problems.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	CODING THEORY
Course Code	**GMMA5E**
Class	III year (2014-2015)
Semester	Odd
Staff Name	T Stalin Alexis
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

.

- Learners get introduced to coding and decoding concepts.
- Train the students in the field of coding theory.

Syllabus

Text: Coding Theory , the essentials-(marcalDekkar, 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 wordtransmitted.

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 theextenedGolay code-Golay code.

Unit 5: Polynomials and Words-Introduction to cyclic codes-Polynomial encoding and decoding-Finding cyclic codes-Dual Cyclic Codes.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2014
1-L1	Unit-1 Coding theory Introduction, word
2-L2	List all the words of lengths and examples
3- L3	Basic assumption about the channel
4-L4	Correcting and deleting error batterns
5-L5	Problem 1,2,3,4,5,6 in correcting and detecting error batterns
6-L6	Information rate
7-L7	Finding the most likely codeword transmitted and problems
8-L8	Theorem
9-L9	Some basic Algebra and examples and problems in basic algebra
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Weight and Distance (Add some distance problems)
12-L11	Maximum likelihood Decoding
13-L12	Reliability of Maximum Likelihood Decoding
14-L13	Error detecting codes
15-L14	Distance of the codes
16-L15	Unit-2 Linear codes
17-L16	Exercise problems in linear codes
18-L17	Two important subspaces- Linear scalar product (or) Dot product
19-L18	Orthogonal vector. Orthogonal to the set
20-L19	Linear Independence, example problems
21-L20	Basic examples and exercise
22-L21	Dimension –examples and exercise
23-L22	Matrices and exercises problems- **Allotting portion for Internal Test-I**
	Internal Test I begins(30-07-2014)
24-L23	Elementary Row operation Leading one and leading column
25-L24	Row Echelon form (REF), Reduced Row Echelon form (PREF)
26-IT-1	**Internal Test-I**
27-L25	Bases for c= $< s >$ and c⊥ $examplesandexercise$
28-L26	Algorithm and examples and exercise problems
29-L27	Algorithm for finding the basis
30-L28	Generating Matrices-Example and exercise problems- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Encoding and exercise
32- L30	Unit-3 parity – check Matrices
33- L31	Theorem 2.7.1
34-P2	**College level meeting/Cell function**
35- L32	Theorems on parity
36- L33	Exercise problems in parity check matrices
37- L34	Exercise problems in parity check matrices
38- L35	Equivalent codes
39- L36	Theorem any linear code c is a equivalent to a linear code C having a generator matrix in standard form

40- L37	Examples and exercise problems
41- L38	Exercise problems in equivalent codes
42- L39	Distance of a linear code
43- L40	Examples and exercise problems
44- L41	Examples and exercise problems
45- L42	Distance of a linear code exercise problems
46- L43	Cosets
47- L44	Example and exercise problems
48- L45	Theorem and Exercise problems
49- L46	Exercise problems in cosaets of the linear code
50- L47	Exercise problems in cosets of a linear code
51- P3	**Department Seminar**
52- L48	Exercise problems in cosets of a linear code
53- L49	Minimal likelihood decoding for linear codes
54- L50	Exercise problems in linear codes
55- L51	Reliability of linear codes
56-L52	Syndrome of the word - **Allotting portion for Internal Test-II**
	Internal Test II begins(18-08-2014)
57-L53	Syndrome decoding array and exercise problems
58-L54	Unit-4 Perfect and related codes
59-IT-II	**Internal Test-II**
60- L55	some bounds forcodeas, hamming
61- L56	Maximum distance separable -**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorem on maximum distance separable
63- L58	Theorems on maximum distance separable
64- L59	Corollary and the theorems
65- L60	Exercise problems in maximum distance separable
66- L61	Theorem Gilbert –varshamov bound
67- L62	Corollary of that theorem
68- L63	Exercise problems in maximum distance separable
69- L64	Perfect codes
70- L65	Hamming codes, extended code
71- L66	Parity check matrix for extended code
72- L67	Weight of the word in the extended code
73- L68	Distance of the extended code
74-P4	**College level meeting/ function**
75- L69	The extended Golay code
76- L70	Unit-5 cyclic linear code
77- L71	Algorithm and division algorithm
78- L72	Exercise problems in division algorithm
79- L73	Polynomial encoding and decoding**Allotting portion for Internal Test-III**
	Internal Test III begins(15-09-2014)
80- L74	Algorithm for decoding linear cyclic decoding
81- L75	Finding cyclic codes
82-IT-III	**Internal Test-III**
83- L76	Another method for linear cyclic codes
84- L77	Exercise problems in linear cyclic codes - **Test Paper distribution and**

	result analysis
85- L78	Dual cyclic codes
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test(24-10-2014)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-10-2014

Course Outcomes

Learning Outcomes	**COs** of the course Coding theory
CO1	Acquire basic knowledge of coding.
CO2	Enable the students to understand the functions oflinear cyclic codes
CO3	Students get prepared for coding through congruence.
CO4	Acquisition of knowledge on the techniques of division algorithm in coding theory

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Calculus
Course Code	**GMMA11**
Class	I year (2014-2015)
Semester	Odd
Staff Name	J. Suresh Suseela V.Selvan
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- This is a foundational course for any student aspiring to complete B.Sc., degree in Mathematics.
- The calculus is the science of determining the effect of very small change.
- Different methods of calculating the derivative of a function and the interpretation of derivative at different circumstances are dealt in detail.
- The functions involving more than one variable and the rate of change with respect to one variable are attributed as partial derivative.
- The application of partial derivatives as a tool for engineers, scientists and social scientists are illustrated.

Syllabus

Major Paper- 1:Calculus (75 hrs)
Text: Calculus(Volume I and Volume II), S.Narayanan and T.K.Manicavachagom Pillay, S.Viswanathan (Printers Publishers) Pvt. Ltd.

Unit 1: Tangent and Normal-Direction of the tangent-Angle of intersection of

curves-subtangent and subnormal-Differential coefficient of the length of an arcof y=f(x)-Polar coordinates-Angle between the radius vector and the tangent-Polar subtangent and polar subnormal-Length of arc in polar coordinates.
(Volume I-Chapter IX-Full-Sections 1.1 to 4.6)

Unit 2: Method of finding the envelope-Curvature-Circle, radius and centre of curvature-Cartesian formulae-Evolute and Involute-Radius of curvature when the curve is given in polar coordinates.
(Volume I-Chapter X- Sections 1.1 to 2.6)

Unit 3: p-r equation-chord of curvature-linear asymptotes.
(Volume I-Chapter X-Sections 2.7 to 3.1 and Chapter XI-Full-Sections 1 to 7)

Unit 4: Multiple integrals-Evaluation of double integrals-Double integral in polar coordinates-Triple integrals.
(Volume II-Chapter 5: Sections 1 to 4)

Unit 5: Infinite integrals-Beta and Gamma functions-Properties of Beta functions-Relation between Beta and Gamma functions-Evaluation of integrals using Gamma functions.
(Volume II-Chapter 7 - Sections 1 to 5)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2014
1-L1	Unit-1 Introduction for Tangent and Normal and Discuss about the direction of the tangent
2-L2	Equations of the tangent and normal at any point of a curve
3- L3	Discuss the problem in direction of tangent
4-L4	Example problems 5,6,7,8 in equation of the tangent and normal at any point of a curve
5-L5	Discussing Exercise problems
6-L6	Properties of the tangents and normal to the curves
7-L7	Exampled problems in properties of the tangent and normal to the curve
8-L8	Exercise problems in properties of the tangent and normal to the curve
9-L9	Discuss about angle of intersection of curves and problems
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Sub tangent and Normal
12-L11	Example problems in sub tangent and normal
13-L12	Differential coefficient of the length of an arc of y=f(x)
14-L13	Polar co-ordinates, angle between the radius vector and the tangent
15-L14	To find the slope of the tangent in polar co-ordinates
16-L15	To find the angle of intersection of two curves φ and whose equations are given in polar co-ordinates
17-L16	Polar sub tangent and polar subnormal, The length of arc in polar co-ordinates
18-L17	Unit-2 Introduction about envelopes

19-L18	Method of finding the envelope and discuss another definition of the envelope of a family of curves
20-L19	Definition of curvature and discuss about circle and centre of curvature
21-L20	Cartesian Formula for the radius of curvature
22-L21	Example problems in Cartesian formula for the radius of curvature
23-L22	Discussing exercise problems- **Allotting portion for Internal Test-I**
	Internal Test I begins(30.07.2014)
24-L23	The co-ordinates of the centre of curvature
25-L24	Problems in the co-ordinates of centre of curvature
26-IT-1	**Internal Test-I**
27-L25	Exercise problems in the co-ordinates of centre of curvature
28-L26	Exercise problems in co-ordinates of centre of curvature
29-L27	Problems in centre of curvature
30-L28	Evolutes and Involutes definitions - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Radius of curvature of cardioids
32- L30	Problems of radius of curvature
33- L31	Problems of radius of curvature
34-P2	**College level meeting/Cell function**
35- L32	Unit-3 p-r equation; pedal equation of a curve
36- L33	Discussing problems in p-r equation
37- L34	Definition of chord of curvature
38- L35	Chords of curvature parallel to the co-ordinate axes.
39- L36	Chord of curvature passing through the pole
40- L37	Discussing problems in chord of curvature
41- L38	Linear asymptotes
42- L39	To find the equation of the asymptotes of a plane algebraic curve
43- L40	Asymptotes parallel to the axis
44- L41	Problems in asymptotes parallel to the axis
45- L42	Another method for finding asymptotes
46- L43	Problems to find rectilinear asymptotes
47- L44	Asymptotes by inspection: definition and examples
48- L45	Intersection of a curve with its asymptotes
49- L46	Problems in intersection of a curve with its asymptotes
50- L47	Problems in intersection of a curve with its asymptotes
51- P3	**Department Seminar**
52- L48	Unit-4 Introduction about multiple integrals
53- L49	Definition of the double integral
54- L50	Evaluation of double integral
55- L51	Corollary and notes of double integral
56-L52	Examples in Double Integral- **Allotting portion for Internal Test-II**
	Internal Test II begins(18.08.2014)
57-L53	Double integrals in polar co-ordinates
58-L54	Repeated integrals in polar co-ordinates and examples
59-IT-II	**Internal Test-II**
60- L55	Triple integrals-Definitions and notes
61- L56	Examples in triples integral - **Test Paper distribution and result analysis**

	Entering Internal Test-II Marks into University portal
62- L57	Examples in triple integral
63- L58	Application of Multiple integrals and examples
64- L59	Co-ordinates of centre of gravity
65- L60	Example problems in centre of gravity
66- L61	Example problems in centre of gravity
67- L62	Exercise problem in centre of gravity
68- L63	Exercise problem in entre of gravity
69- L64	Unit-5 Introduction about Improper integrals: Beta and Gamma function
70- L65	Infinite Integral –Definition and examples
71- L66	Example problems in Integrals to $+\infty$
72- L67	Example problems in integral to $-\infty$
73- L68	Example problems in Integral from $-\infty$ to $+\infty$
74-P4	**College level meeting/ function**
75- L69	Integral becoming infinite at certain points in the interval of integration
76- L70	Example in infinite integral
77- L71	Example problems is infinite integral
78- L72	Exercise problems in infinite integral
79- L73	Exercise problems in infinite integral- Allotting portion for Internal Test-III
	Internal Test III begins(15.10.2014)
80- L74	Definition of Beta and Gamma functions
81- L75	**Convergence of gamma n definitions and corollary**
82-IT-III	**Internal Test-III**
83- L76	**Recurrence formula of Gamma function**
84- L77	Properties of Beta function **-Test Paper distribution and result analysis**
85- L78	Relation between Beta and Gamma function
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 24.10.2014**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31.10.2014

Course Outcomes

Learning Outcomes	**COs** of the course “<Calculus >”
CO1	illustrate the limit definition and recall the formulae and rules of differentiation to differentiate the given functions
CO2	Make use of partial fraction and Leibnitz formula to find nth derivative of algebraic and trigonometric functions in addition to formation of equations involving derivatives.
CO3	Apply the concepts of differentiation to discuss the maxima and minima of the functions and find the equations of the tangent and normal.
CO4	Define and determine envelope, curvatures, involute and evolute of

	the curve.
CO5	Identify and apply partial differentiation to determine the maxima and minima of functions of two variables and approximate error.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc. Mathematics
Course Name	Algebra
Course Code	**GMMA12**
Class	I year (2014-2015)
Semester	Odd
Staff Name	G.S.GRACE PREMA
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- In many ways, this course is the true gateway into the mathematics major, requiring rigorous proofs, introducing important topological concepts and laying the groundwork for Algebra and Topology.

Syllabus

Major Paper- 2:Algebra (75 hrs)

Text: Algebra(Volume I),T.K.ManicavachagomPillay& others, S.Viswanathan (Printers Publishers) Pvt. Ltd.

Unit 1: Theory of equations-Remainder theorem-relation between roots and coefficients of equations-symmetric function of the roots.
(Chapter 6: Sections 1to 12)

Unit 2: Sum of the rth powers of the roots of an equation-Newton's theoremTransformation of equations.

(Chapter 6: Sections 13 to 15)

Unit 3: Reciprocal equations- To increase or decrease the roots of a given equation by a given quantity-removal of terms-to form an equation whose roots are any power of the roots of a given equation**.**

(Chapter 6: Sections 16 to 20)

Unit 4: Descarte's rule of signs-Rolle's theorem-Multiple roots-Strum's theorem.

(Chapter 6: Sections 24 to 27)

Unit 5: Solutions of Numerical Equations-Newton's method of divisorsHorner's method-Cardon's method of solving cubic equations.

(Chapter 6: Sections 28, 29, 30 and 34)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2014
1-L1	Introduction
2-L2	Theory of Equations
3- L3	Theory of Equations
4-L4	Theory of Equations
5-L5	Formation of equations
6-L6	Formation of equations
7-L7	Formation of equations
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Relation between roots and Coefficients
10- L9	Relation between roots and Coefficients
11-L10	Relation between roots and Coefficients
12-L11	Relation between roots and Coefficients
13-L12	symmetric function of the roots
14-L13	symmetric function of the roots
15-L14	symmetric function of the roots
16-L15	symmetric function of the roots
17- L16	Sum of the powers of the roots of an equation
18- L17	Sum of the powers of the roots of an equation
19- L18	Sum of the powers of the roots of an equation
20- L19	Newton's theorem
21- L20	Problem Discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins(30.07.2014)
22- L21	Newton's theorem
23- IT-1	**Internal Test-I**
24- L22	ReciprocalEquations
25- L23	ReciprocalEquations
26- L24	ReciprocalEquations**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	ReciprocalEquations
28- L26	Transformation of equations

29- L27	Transformation of equations
30- P2	**College level meeting/Cell function**
31-L28	Descarte's rule of signs
32-L29	Descarte's rule of signs
33-L30	Descarte's rule of signs
34- L31	Rolle's theorem
35- L32	Rolle's theorem
36- L33	Rolle's theorem
37- L34	Multiple roots
38- L35	Multiple roots
39- L36	Multiple roots
40- L37	Sturm's Theorem
41- L38	Multiple roots
42-P3	**Department Seminar**
43- L39	solving appropriate solution of equations usingNewton's and Horner's method.
44- L40	solving appropriate solution of equations usingNewton's and Horner's method.
45- L41	solving appropriate solution of equations usingNewton's and Horner's method.
46- L42	solving appropriate solution of equations usingNewton's and Horner's method.
47- L43	Problem Discussion - **Allotting portion for Internal Test-II**
	Internal Test II begins(18.08.2014)
48- L44	solving appropriate solution of equations usingNewton's and Horner's method.
49-IT-II	**Internal Test-II**
50-L45	Problems
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Problems
53- L48	Problems
54- L49	Biquadratic equations
55- L50	Biquadratic equations
56- L51	Biquadratic equations
57- L52	Biquadratic equations
58- L53	cubic equations solutionsbyCardon's method
59-P4	**College level meeting/ function**
60- L54	cubic equations solutionsbyCardon's method
61- L55	cubic equations solutionsbyCardon's method
62- L56	cubic equations solutionsbyCardon's method
63- L57	Problems
64- L58	Problem Discussion - **Allotting portion for Internal Test-III**
	Internal Test III begins(15.10.2014)
65- L59	Problems
66- L60	Revision
67-IT-III	**Internal Test-III**
68- L61	Problem Discussion
69- L62	Problem Discussion
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test24.10.2014**
72-MT	**Model Test**

73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31.10.2014

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra"
CO1	Recall elementary properties of real numbers which lead to the Archimedean property, countability and uncountability.
CO2	Demonstrate with example, sequences which are convergent, divergent and oscillating. Enumerate properties of converging sequences and also identifies the algebraic operations on sequences
CO3	Outline the concept of Cauchy sequence. Demonstrate the existence of limit superior and limit inferior for any sequences. Existence of limit points in any bounded infinite sets is demonstrated.
CO4	Define rings and subrings and illustrate with examples.
CO5	Learners will acquire knowledge on Counting Principle and homomorphism.
CO6	Knowledge gained about Automorphisms and Cayley's theorem.
CO7	Learners will gain knowledge about Permutation groups, Sylow's theorems and Direct products.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Sequences, Series and Trigonometry
Course Code	**GMMA21**
Class	II year (2014-2015)
Semester	Odd
Staff Name	S Vijila Velvet Daisy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Gaining knowledge on series.
- Gaining knowledge on Trignomentry.

Syllabus

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.ManicavachagomPillay,

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+ method-Gregory's series.
(Text-2 Chapter IV(full), Chapter V-Section 5, Chapter VI-Section 3)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2014
1-L1	UNIT-I Sequences and its examples
2-L2	Bounded Sequences
3- L3	Monotonic Sequences
4-L4	Convergent Sequences and theorem
5-L5	Examples and theorem on convergent Sequences
6-L6	Divergent and oscillating Sequences
7-L7	Theorems and examples on Divergent
8-L8	The algebra of limits
9-L9	Theorem and corollary on Monotonic
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Theorem 15,16,17
12-L11	Theorem 18,19
13-L12	Theorem 20,21
14-L13	Results on Algebra of limits
15-L14	Theorem and example
16-L15	Problems on algebra of limits
17-L16	Problems on algebra of limits
18-L17	UNIT-II Behaviour of Monotonic sequence
19-L18	Problems on Monotonic sequence
20-L19	Problems on Monotonic sequence
21-L20	Cauchy's 1^{st}limit theorem
22-L21	Cauchy's theorem
23-L22	Cauchy's 2^{nd}limit theorem - **Allotting portion for Internal Test-I**
	Internal Test I begins(30.07.2014)
24-L23	Problems on limit theorem
25-L24	Problems on limit theorem
26-IT-1	**Internal Test-I**
27-L25	Subsequence's
28-L26	Peak point definition and theorem
29-L27	Limit point
30-L28	Cauchy's Sequences - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Cauchy's general principle of convergence
32- L30	Examples on limit point
33- L31	Theorem on limit point
34-P2	**College level meeting/Cell function**
35- L32	UNIT-III Series of positive terms definition and theorem
36- L33	Examples and Note on series
37- L34	Cauchy's general principle of convergence
38- L35	Comparison test
39- L36	Theorem on Comparison test

40- L37	Problems on Comparison test
41- L38	Problems on Comparison test
42- L39	Kummer’s test
43- L40	D’Alembert’s ratio test
44- L41	Raabe’s test
45- L42	Demorgan and Bertand’s test
46- L43	Gauss test
47- L44	Problems on Gauss test
48- L45	Problems on Raabe’s test
49- L46	Cauchy’s root test
50- L47	Cauchy’s condensation test
51- P3	**Department Seminar**
52- L48	UNIT-IV Alternatig series
53- L49	Leibnitz test
54- L50	Problems on Leibnitz test
55- L51	Problems on Leibnitz test
56-L52	Absolute convergence - **Allotting portion for Internal Test-II**
	Internal Test II begins(18.08.2014)
57-L53	Conditionally convergence
58-L54	Theorem and Problems on Absolute convergence -
59-IT-II	**Internal Test-II**
60- L55	Problems on conditionally convergence
61- L56	Multiplication of series **-Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Examples and Note
63- L58	Abel’s Theorem
64- L59	Theorem on Absolute convergence
65- L60	Problems on Absolute convergence
66- L61	Marten’s Theorem
67- L62	Theorems on Absolute convergence
68- L63	Problems on Mertens
69- L64	UNIT-V Hyperbolic function
70- L65	Results on Hyperbolic function
71- L66	Hyperbolic function definition and notes
72- L67	Relation between Hyperbolic function
73- L68	Problems on Hyperbolic function
74-P4	**College level meeting/ function**
75- L69	Hyperbolic function corresponding to relation between circular function
76- L70	Problems on Hyperbolic function
77- L71	Inverse hyperbolic function
78- L72	Problems on Inverse hyperbolic function
79- L73	Problems on Inverse hyperbolic function - **Allotting portion for Internal Test-III**
	Internal Test III begins(15.10.2014)
80- L74	Logarithms and complex quantities
81- L75	General value of logarithm of (x+iy)
82-IT-III	**Internal Test-III**
83- L76	Problems on Logarithms

84- L77	Summation of series - **Test Paper distribution and result analysis**
85- L78	Summation of series
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test24.10.2014**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31.10.2014

Course Outcomes

Learning Outcomes	**COs** of the course "Sequences, Series and Trigonometry"
CO1	acquire the knowledge of various inequalities and their applications
CO2	have in-depth knowledge of various types of sequences
CO3	learn sub-sequences and also finding the limits of sequences
CO4	deepen the knowledge of infinite series and various tests for finding the behaviour of series
CO5	apply these concepts in other fields of mathematics

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	LINEAR ALGEBRA
Course Code	**GMMA51**
Class	III year(2014-2015)
Semester	Odd
Staff Name	J VIJAYA XAVIER PARITHIPAN
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Linear algebra is a branch of mathematics that studies systems of linear equations and the properties of matrices.
- The concepts of linear algebra are extremely useful in physics, economics and social sciences, natural sciences, and engineering.
- To understand the axiomatic structure of a modern mathematical subject and learn to construct simple proofs.
- To solve problems those apply Linear Algebra to Chemistry, Economics and Engineering.

Syllabus

Major Paper 7: Linear Algebra (90Hrs)

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))

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2014
1-L1	Unit-I Introduction
2-L2	Definitions and Examples
3- L3	Scalars, vectors, scalars multiple
4-L4	Notes and Remarks
5-L5	Theorems on vectorspace
6-L6	Subspaces
7-L7	Theorems on supspaces
8-L8	Solved problems and examples
9-L9	Theorems using operations
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Linear transformation
12-L11	Definitions about Homomorphism, Epimorphism and Kernel
13-L12	Fundamental theorem of homomorphism
14-L13	Theorems on vector spaces
15-L14	Span of a set
16-L15	Linear combination, linear span
17-L16	Theorems and examples
18-L17	Unit-II Linear independence
19-L18	Finite dimensional
20-L19	Finite dimensional and its theorems
21-L20	Examples on finite dimensional
22-L21	Linearly independence and dependent
23-L22	Exercises problem - **Allotting portion for Internal Test-I**
	Internal Test I begins(30-07-2014)
24-L23	Note and examples
25-L24	Theorems – any subset of a linearly independent set is linearly independent
26-IT-1	**Internal Test-I**
27-L25	Theorems and examples
28-L26	Basis

29-L27	Theorems on basis
30-L28	Exercise problem **-Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Theorems and examples
32- L30	Any two bases of finite dimensional vector space V have the same numbers of elements
33- L31	Dimensional
34-P2	**College level meeting/Cell function**
35- L32	Maximal linear independent set
36- L33	Unit-III Rank and nullity
37- L34	Theorems and examples
38- L35	Singular and non-singular
39- L36	Exercise problems on rank
40- L37	Some solved problems on
41- L38	Matrix of a linear transformation
42- L39	Note on matrix
43- L40	Solved problems on Rank of matrix
44- L41	Definition and theorems
45- L42	Exercise problems on matrix
46- L43	Rank of matrix
47- L44	Solved problems
48- L45	Characteristic matrix
49- L46	Theorems and examples on Rank of matrix
50- L47	Theorems and corollary on Rank of matrix
51- P3	**Department Seminar**
52- L48	Solved problems on Characteristic matrix
53- L49	Unit-IV Characteristis equation and cayley Hamilton theorem
54- L50	Matrix polynomial
55- L51	Definitions and examples
56-L52	Cayley Hamilton theorem - **Allotting portion for Internal Test-II**
	Internal Test II begins(18-08-2014)
57-L53	Note and solved problems on Cayley Hamilton theorem
58-L54	Problems using Cayley Hamilton theorem
59-IT-II	**Internal Test-II**
60- L55	Exercise problem on Cayley Hamilton theorem
61- L56	Eigenvalues ,Eigen vectors - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Characteristic roots and properties of Eigen values
63- L58	Results on Eigen values
64- L59	Corollary of Eigen values
65- L60	Solved problems on Eigen values
66- L61	Solved problems on Eigen values
67- L62	Problems to find Eigenvalues
68- L63	Problems to find Eigenvalues
69- L64	Solved problems on Eigenvalue
70- L65	Unit-V Inner product spaces
71- L66	Eucildean space
72- L67	Some notes on Eucildean space

73- L68	Theorems and examples on Eucildean space
74-P4	**College level meeting/ function**
75- L69	Norm, unit vector-definition
76- L70	Solved problems on Norm
77- L71	Theorems using norm
78- L72	Orthogonal
79- L73	Some notes and definitions - **Allotting portion for Internal Test-III**
	Internal Test III begins(15-09-2014)
80- L74	Theorems using orthogonal set
81- L75	Gram –Schmidt Orthogonalisation
82-IT-III	**Internal Test-III**
83- L76	Solved problems on orthogonal set
84- L77	Orthogonal complement - **Test Paper distribution and result analysis**
85- L78	Corollary and solved problems on Orthogonal complement
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (24-10-2014)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-10-2014

Course Outcomes

Learning Outcomes	**COs** of the course linear Algebra
CO1	Enable the students to learn about the convergence and divergence of the series.
CO2	find the roots for the different types of the equations
CO3	On successful completion of this course the students should have gained knowledge about the convergence of series and solving equations.
CO4	know the fundamentals of vector space
CO5	Understand basis and dimension of a vector space.
CO6	DetermineEigen values and Eigen vectors.
CO7	Get interest in pure mathematics.

#Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school student

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	B Sc Mathematics
Course Name	Real Analysis
Course Code	**GMMA52**
Class	IIIyear (2014-2015)
Semester	Odd
Staff Name	W. RajammalRanjitha Mary
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The course deals with metric spaces which is a classical extension of the real line and its properties in terms of the distance.
- The course introduces to the students, metric spaces and its properties.
- The properties like connectedness, completeness and compactness which are inherent in nature in the real line are extended to the metric spaces.
- Also properties like continuity and uniform continuity are exploited.

Syllabus

Major Paper 8: Real Analysis (90 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-UniformContinuity-Discontinuous functionson **R**.

(Chapter 4(full))

Unit 4: Connectedness-Connected subsets of **R**-Connectedness and Continuity-Contraction Mapping Theorem.

(Chapter 5 (full) and Chapter 8 upto theorem 8.2)

Unit 5: Compactness-Comapct metric spaces-Compact subsets of **R**-Heine Borel Theorem-Equivalent Characterizations for compactness-Compactness and Continuity.

(Chapter 6(full))

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2014
1-L1	Unit-I Introduction on Countable sets
2-L2	Theorems and Problems in countable sets
3- L3	Uncountable sets
4-L4	Metric spaces: Definition and examples
5-L5	Examples on a metric spaces
6-L6	Solved problems on a metric spaces
7-L7	Bounded sets in a metric spaces
8-L8	Definition of diameter and its examples
9-L9	Open ball in a metric space
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Examples in open ball
12-L11	Open sets: Definition and examples
13-L12	Theorem on open sets
14-L13	Solved problems on open sets
15-L14	Equivalentmetrices
16-L15	Subspaces: Definition and examples
17-L16	Solved problems on subspaces
18-L17	Unit-II Interior of a set: Definition and examples
19-L18	Interior of a set: Theorems
20-L19	Closed set: Definition and examples
21-L20	Closed ball: Definition, examples and theorem
22-L21	Closure: Definition and examples
23-L22	Exercise problems- **Allotting Portion for Internal Test I**
	Internal Test I begins(30-07-2014)
24-L23	Closure: Definition and theorem
25-L24	Limit point: Definition and examples
26-IT-1	**Internal Test-I**
27-L25	Limit point: Theorems
28-L26	Corollary of limit point
29-L27	Solved problems on limit point
30-L28	Exercise problems on limit point :**Test Paper distribution and result analysis**

	Entering Internal Test-I Marks into University portal
31- L29	Dense set: Definition and examples
32- L30	Dense set: Theorems and solved problems
33- L31	Completeness: Definition and note
34-P2	**College level meeting/Cell function**
35- L32	Completeness: Theorems and examples
36- L33	Theorems and solved problems Completeness
37- L34	Cantor’s intersection theorem
38- L35	Unit III- Baire’s category theorem- Definition and examples
39- L36	Baire’s category theorem and Solved problems
40- L37	Continuity- Definition, ,note, theorem and examples
41- L38	Theorems and solved problems
42- L39	Solved problems on Continuity
43- L40	Homeomorphism: Definition and examples
44- L41	Examples Continuity
45- L42	Isometric definition and examples
46- L43	Uniform continuity- Introduction , definition and note
47- L44	Solved problems on Continuity
48- L45	Discontinuous function on R
49- L46	Discontinuity function- Definition and examples
50- L47	Theorems on Discontinuity function
51- P3	**Department Seminar**
52- L48	Oscillation: Definition and examples
53- L49	Examples and theorem
54- L50	Theorem on Oscillation
55- L51	Unit IV: Connectedness: Introduction, definition and examples
56-L52	Solved problems on Connectedness - **Allotting portion for Internal Test-II**
	Internal Test II begins(18-08-2014)
57-L53	Connectedness and continuity- theorem
58-L54	Solved problems on Connectedness
59-IT-II	**Internal Test-II**
60- L55	Connected subsets of R- theorem
61- L56	Solved problems on Connectedness - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Contraction mapping theorem- Introduction
63- L58	Definition and examples Contraction mapping
64- L59	Contraction mapping theorem
65- L60	Theorem on Contraction mapping
66- L61	Unit V: Compactness- Introduction and Compact metric space-Definition and examples
67- L62	Theorems on Compactness
68- L63	Note and theorems on Compactness
69- L64	Theorems on Compactness
70- L65	Compact subset of R
71- L66	Heine Borel theorem
72- L67	Theorem on Compactness
73- L68	Equivalent characterisation for compactness- definition and examples

74-P4	**College level meeting/ function**
75- L69	Theorems on Compactness
76- L70	Totally bounded definition and examples
77- L71	Subsequence- definition and examples
78- L72	Corollary
79- L73	Sequentially compact- theorems - **Allotting portion for Internal Test-III**
	Internal Test III begins(15-09-2014)
80- L74	Theorems on Sequentially compact
81- L75	Solved problems on Sequentially compact
82-IT-III	**Internal Test-III**
83- L76	Compactness and continuity
84- L77	Note and theorems on Compactness and continuity - **Test Paper distribution and result analysis**
85- L78	Solved problems on Compactness and continuity
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (24-10-2014)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-10-2014

Course Outcomes

Learning Outcomes	**COs** of the course Real analysis
CO1	Recall elementary properties of real numbers which lead to the Archimedean property, countability and uncountability.
CO2	Predict correct choice of test and apply for test of convergence of series.
CO3	Demonstrate connectedness and correlate the relation between the space and its image under a continuous map with reference to connectedness.
CO4	Describe completeness and its relation with totally boundedness.
CO5	Describe compactness of a metric space and compile all equivalent definitions.
CO6	compare real line and metric space concepts
CO7	get a good foundation for the future studies in Analysis

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Application of Differential Equation
Course Code	**GSMA3A**
Class	I year (2014-2015)
Semester	Odd
Staff Name	J. Suresh Suseela
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- Mathematics will allow the students to develop a sophisticated understanding of mathematical structures and principles while gaining a wide range of skills that are attractive to employers.
- To reinforce and enhance the mathematical tools introduced earlier. Differential equation as a mathematical model for solving problems in chemistry is the central theme of the course.
- This course deals with differentiation, integration, differential equations and Laplace transform.

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2014
1-L1	Unit I- Introduction on first order equation
2-L2	Introduction on Applications of first order equation
3- L3	Introduction on Growth, decay and chemical reaction
4-L4	Basic definition and some examples
5-L5	Derivation of Growth, decay and chemical reaction
6-L6	Example problems in Growth
7-L7	Example problems in Decay
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Example problems based on chemical reaction
10- L9	Exercise problems in Growth and decay
11-L10	Exercise problems in chemical reaction
12-L11	Unit II- Introduction on flow of water
13-L12	Introduction on flow of water from an orifice
14-L13	Derivation on flow of water from an orifice
15-L14	Example problems on flow of water from an orifice - **Allotting portion for Internal Test-I**
	Internal Test I begins(30.07.2014)
16-L15	Exercise problems in flow of water
17-IT-1	**Internal Test-I**
18-L16	Introduction on falling bodies and other rate problems
19-L17	Derivation on freefall under gravity- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Problems based on freefall under gravity
21- L19	Derivation on retarded fall
22- P2	**College level meeting/Cell function**
23-L20	Problems based on retarded fall

24-L21	Exercise and example problems in flow of water
25-L22	Unit III Introduction on Brachistrochrome
26-L23	Brachistrochrome problems
27-L24	Derivation of Brachistrochrome
28-L25	Derivation of Brachistrochrome (conclusion)
29-L26	Solving Brachistrochrome problems
30-L27	Introduction on simple electric circuits
31-L28	Diagram and basic elements of simple electric circuits
32-L29	The properties and relation of the elements of simple electric circuits
33-L30	Derivation on simple electric circuits
34- P3	**Department Seminar**
35-L31	Example and exercise problems in simple electric circuits
36-L32	Unit IV- Introduction on variable mass- **Allotting portion for Internal Test-II**
	Internal Test II begins(18.08.2014)
37- L33	Introduction on dynamical problems in variable mass
38- IT-II	**Internal Test-II**
39-L34	Derivation of dynamical problems in variable mass
40-L35	Example and exercise problems in Dynamical problems- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Introduction on Application to vibrations in mechanical systems
42- L37	Derivation on damped simple harmonic vibration
43- L38	Derivation on damped vibration
44- P4	**College level meeting/ function**
45-L39	Derivation on damped vibration
46-L40	Derivation on forced vibration
47-L41	Example and exercise problems in vibration
48-L42	**Unit V** Introduction on Newton's law
49-L43	Newton's law of gravitation
50-L44	Motion of particles derivation - **Allotting portion for Internal Test-III**
	Internal Test III begins(15.10.2014)
51 L45	Introduction on central force
52- L46	Central gravitational force
53-IT-III	**Internal Test-III**
54-L47	Kepler's I and III law
55-L48	Newton's deduction from Kepler's law- **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test24.10.2014**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31.10.2014

Course Outcomes

Learning Outcomes	**COs** of the course Application of Differential Equation
CO1	apply the concept of differentiation of functions
CO2	identify and apply partial differentiation to determine the maxima and minima of functions of two variables
CO3	evaluate definite and indefinite integrals
CO4	formulate and solve the first and second order differential equations
CO5	use Laplace transform techniques to solve differential equations

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	STATISTICS II
Course Code	**GAST21**
Class	I year (2015-2016)
Semester	Even
Staff Name	T Santhakumari V.Selvan
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- This is the second segment of a sequential course as a tool for solving problems in real life.
- The aim of this course is to enable the students to understand statistics.
- The course deals with analysis of variance- analysis of time series and statistical quality control.

Syllabus

Statistics-II
Text : Statistics, S. Arumugam and Others.
Unit I: 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 II: Statistical Quality Control-Definition, advantages, Process Control-Control Chart, Mean Chart, Range Chart, P-Chart, Product Control-Sampling Inspection Plans.

Unit III: 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 IV: 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 V: Analysis of Variance-One way and two way classified data-Basis of experimental design-Simple problems.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 16.06.2016
1-L1	Unit-1 Index numbers introduction and price Relative method
2-L2	Solved examples on Aggregate and price relative method
3- L3	Weighted index number and weighted aggregative method with example
4-L4	Exercise problems of weighted average price relative method
5-L5	Exercise problems on index number
6-L6	Consumer price index numbers formulas
7-L7	Solved problems of consumer price index number
8-L8	Conversion of chain based index number into fixed base index with solved problems
9-L9	Exercise problems of conversion of index number
10-P1	**Inauguration of Mathematics Association**
11-L10	Exercise problems of conversion of index number
12-L11	Exercise problems of conversion of index number
13-L12	Unit-2 Statistical Quality control- definition
14-L13	Advantage, process control with examples
15-L14	Solved problems on statistical Quality control
16-L15	Exercise problems on statistical Quality control
17-L16	Exercise problems on statistical Quality control
18-L17	Control chart, mean chart, rang chart
19-L18	Solved problems on chart
20-L19	Exercise problems on chart
21-L20	Exercise problems on chart
22-L21	Production control definition with example
23-L22	Solved problem on production control- **Allotting portion for Internal Test-I**
	Internal Test I begins (25.07.2016)
24-L23	Solved problems on production control
25-L24	Exercise problems on production control
26-IT-1	**Internal Test-I**
27-L25	Exercise problems on production control
28-L26	Sampling inspection plan- introduction
29-L27	Solved problems on sampling inspection plan
30-L28	Exercise problems on sampling inspection plan- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Exercise problems on sampling inspection plan
32- L30	Exercise problems on sampling inspection plan

33- L31	Unit-3 Tests of significance- sampling introduction
34-P2	**College level meeting/Cell function**
35- L32	Sampling distribution with example
36- L33	Testing of hypothesis- definition and errors in testing of hypothesis
37- L34	Procedure for testing of hypothesis and significance for large samples
38- L35	Difference of properties and solved problems on sampling
39- L36	Solved problems on tests on significances
40- L37	Solved problems on tests on significances
41- L38	Solved problems on tests on significances
42- L39	Exercise problems on tests on significance
43- L40	Exercise problems on tests on significance
44- L41	Test of significance for defence of sample means
45- L42	Solved problems on sample means
46- L43	Exercise problems on sample means
47- L44	Test for standard deviation
48- L45	Solved problems on standard deviation
49- L46	Exercise problems on standard deviation
50- L47	Test of significance for correlation coefficient
51- P3	**Department Seminar**
52- L48	Solved problems and exercise
53- L49	Unit-4 Test of significance t–distribution
54- L50	Solved problems on t-distribution
55- L51	Solved problems on t-distribution
56-L52	Exercise problems on t-distribution - **Allotting portion for Internal Test-II**
	Internal Test II begins (22-08-2016)
57-L53	Exercise problems on t-distribution
58-L54	Exercise problems on t- distribution
59-IT-II	**Internal Test-II**
60- L55	Test of significance based on F-distribution
61- L56	Solved problems on F-distribution **-Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Exercise problems on F-distribution
63- L58	Exercises problems on F-distribution
64- L59	Exercise problems on F-distribution
65- L60	Test for significance sample correlation and solved problems
66- L61	Exercise problems on sample correlation
67- L62	Exercise problems on sample correlation
68- L63	Exercise problems on sample correlation
69- L64	Unit-5 Analysis of variance-Introduction
70- L65	One criterion of classification
71- L66	Solved problems on one criterion
72- L67	Solved problems on one criterion
73- L68	Solved problems on one criterion
74-P4	**College level meeting/ function**
75- L69	Exercise problems on one criterion
76- L70	Exercise problems on one criterion
77- L71	Two criteria of classification

78- L72	Solved problems on two criteria
79- L73	Solved problems on two criteria**Allotting portion for Internal Test-III**
	Internal Test III begins (03-10-2016)
80- L74	Exercise problems of two criteria
81- L75	There criteria of classification, Latin square
82-IT-III	**Internal Test-III**
83- L76	Solved problems of Latin square
84- L77	Solved problems of Latin square - **Test Paper distribution and result analysis**
85- L78	Exercise problems of Latin square
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 17-10-2016**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course STATISTICS II
CO1	outline basic principles in sampling also apply testing hypothesis on large samples at appropriate situations.
CO2	apply testing hypothesis on small samples at appropriate situations.
CO3	analyze various index numbers and formulate the procedure to measure the change in the variable over the period of time.
CO4	Acquire knowledge on Basic Concepts of Expectation and continuous & discrete distribution
CO5	predict the future values based on previously observed values using concept of the time series
CO6	evaluate the interdependency of two or more variables.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature　　　　　　　　　　　　　　　　　　　　Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Number Theory
Course Code	**GMMA6A**
Class	III year (2015-2016)
Semester	Even
Staff Name	A. Alwyn Asir
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The study of number theory inevitably includes knowledge of the problems and techniques of elementary number theory, however the tools which have evolved to address such problems and their generalizations are both analytic and algebraic, and often intertwined in surprising ways.
- This course covers topics from classical number theory including discussions of mathematical induction, prime numbers, division algorithms, congruences, and quadratic reciprocity.

Syllabus

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 Chience Reminder Theorem.
(Chapter 4: Sections 4.2 to 4.4)

Unit 5: Fermat‘s Theorem-Wilson‘s Theorem.
(Chapter 5: Sections 5.2, 5.3)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 02-12-2015
1-L1	Unit – I Introduction
2-L2	Mathematical Induction
3- L3	Well Ordering Principle
4-L4	First principle of finite induction
5-L5	First principle problems
6-L6	First principle problems
7-L7	Bernoulli’s inequality
8-L8	Second principle of induction
9-L9	Lucas sequence
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Second principle problems
12-L11	Pascal rule
13-L12	Newton’s identity
14-L13	Binomial theorem
15-L14	Cantalan number and Problems
16-L15	Pentagonal number
17-L16	Early Number Theory
18-L17	Unit – II Division Algorithm
19-L18	Division Algorithm relatedCorollary , Example
20-L19	Division Algorithm related problems
21-L20	Greatest Common Divisor – Definitions , Example , Note
22-L21	Greatest Common Divisor related Theorems , Corollary
23-L22	Relatively prime , Euclidean lemma - **Allotting portion for Internal Test-I**
	Internal Test I begins(25-01-2016)
24-L23	Mathematical Induction’s Problems
25-L24	Euclidean Algorithm and GCD problems
26-IT-1	**Internal Test-I**
27-L25	Least Common Multiple – Definitions , Theorems
28-L26	Least Common Multiple – Problems
29-L27	Diophantine equation – Definitions , Theorems
30-L28	Diophantine equations Corollary - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Diophantine equation’s Examples
32- L30	Diophantine equation’s Problems
33- L31	Divisions Algorithm’s more problems

34-P2	**College level meeting/Cell function**
35- L32	Divisions Algorithm's problems
36- L33	Unit – III Primes and their distributions
37- L34	Composite number's definitions and theorems
38- L35	Corollary to the above theorems
39- L36	Fundamental theorem of Arithmetic
40- L37	Pythagoras theorem
41- L38	Pythagoras theorem related problems
42- L39	Pythagoras theorem related results
43- L40	The Sieve of Eratosthenes – Explanation
44- L41	The Sieve of Eratosthenes related problems
45- L42	Euclid theorem
46- L43	Euclidean number's definition and examples
47- L44	Euclidean number's theorems and result
48- L45	Euclidean number's corollary
49- L46	Repunit – Definition and Theorem
50- L47	Other two theorems on repunit
51- P3	**Department Seminar**
52- L48	Twin prime – Examples and Problems
53- L49	Unit – IV Theory of Congruence
54- L50	Definitions and Theorems on Congruence
55- L51	Properties for congruence
56-L52	Problems for congruence - **Allotting portion for Internal Test-II**
	Internal Test II begins(22-02-2016)
57-L53	Congruence related problems
58-L54	Binary and decimal representation of integers
59-IT-II	**Internal Test-II**
60- L55	Binary representation related problems
61- L56	Solution of congruence – Definitions and Corollary - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Decimal expansion's theorems and problems
63- L58	Polyndrome – Definitions and Problems
64- L59	Linear Congruence Theorem
65- L60	Problems on Linear Congruence
66- L61	Chinese Remainder Theorem
67- L62	Theorem on System of Linear Congruence
68- L63	System of Linear Congruence's problems
69- L64	System of Linear Congruence's problems
70- L65	Unit – V Fermat Theorem
71- L66	Corollary to Fermat Theorem
72- L67	Lemma to the above Corollary
73- L68	Wilson's Theorem
74-P4	**College level meeting/ function**
75- L69	Quadratic Congruence's Theorem
76- L70	Fermat – Kraitchik factorisation method
77- L71	Problems on Fermat's method
78- L72	Pseudoprime – Definition and Theorems

79- L73	Absolute Pseudoprime - Definitions **- Allotting portion for Internal Test-III**
	Internal Test III begins(28-03-2016)
80- L74	Absolute Pseudoprime – Notes
81- L75	Problems on Wilson's theorems
82-IT-III	**Internal Test-III**
83- L76	Problems on Wilson's theorem
84- L77	Problems on Fermat theorem - **Test Paper distribution and result analysis**
85- L78	Problems using Fermat theorem
	Entering Internal Test-III Marks into University portal **Model test beings (11-04-2016)**
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course Number Theory
CO1	Recall the basic concepts of divisibility.
CO2	Demonstrate renowned theorems in solving congruences.
CO3	Discuss on quadratic congruence equations.
CO4	Analyse various arithmetical functions.
CO5	Identify the numbers of special form and apply divisibility rules in solving Diophantine equations.
CO6	Have an in-depth knowledge in division algorithm, Euclidean algorithm and its applications.
CO7	Understand the concept of well-ordering principle and Archimedean property.
CO8	Acquire the basic properties of congruence.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Vector Calculus
Course Code	**GMMA21**
Class	II year (2015-2016)
Semester	Even
Staff Name	J. Suresh Suseela
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- This is a foundational course for any student aspiring to complete B. Sc degree in mathematics.
- The applicability of the subject is enormous in nature.
- The first unit is primarily devoted for the basics on vectors.

Syllabus

Major Paper- 3: Vector Calculus (75 hrs) Text:

Vector Analysis, P.Duraipandian and LaxmiDuraipandian, Emerald Publishers

Unit 1: Differentiation of vector functions-Gradient of a scalar point function

(Sections 1.1 to 2.5)

Unit 2: Divergence and curl of a vector point function.

(Sections 2.6 to 2.8)

Unit 3: Integration of point function-Line integrals-Surface integrals.

(Sections 3.1 to 3.5 and Problems 1 to 30 in section 3.8)

Unit 4: Volume integrals-Cylindericaland spherical polar coordinates-Gauss divergence theorem.

(Sections 3.6, 3.7 and problems 31 to 35 in Section 3.8. Sections 4.2, 4.3 and problems 1 to 21 in section 4.8)

Unit 5: Green's theorem in plane, Stoke's theorem, integral theoremOperational meaning of $\boldsymbol{\nabla}$, $\boldsymbol{\nabla} o$, $\boldsymbol{\nabla}\times$ in terms of surface integrals.

(Sections 4.4 to 4.7 and problems 22 to 44 in Section 4.8)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 16.06.2016
1-L1	Unit I Introduction to vectors
2-L2	Vector point functions
3- L3	Vector point functions
4-L4	Scalar point functions
5-L5	Scalar point functions
6-L6	problems
7-L7	dot product
8- P1	**Inauguration of Mathematics Association**
9- L8	cross product of vectors
10- L9	cross product of vectors
11-L10	product of three and four vectors
12-L11	geometrical interpretation of dot and cross product and their related aspects
13-L12	Derivative of a Vector & Derivative of sum of vectors
14-L13	Derivative of a Vector & Derivative of sum of vectors
15-L14	Derivative of product of a Scalar and Vector point function
16-L15	Derivative of product of a Scalar and Vector point function
17- L16	problems
18- L17	problems
19- L18	Gradient of a scalar point function
20- L19	Unit II Divergence
21- L20	Divergence- **Allotting portion for Internal Test-I**
	Internal Test I begins(25.07.2016)
22- L21	volume of parallelepiped
23- IT-1	**Internal Test-I**
24- L22	volume of parallelepiped
25- L23	tetrahedron
26- L24	tetrahedron - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Problem Discussions
28- L26	Problem Discussions
29- L27	Problem Discussions
30- P2	**College level meeting/Cell function**

31-L28	vector equationlines
32-L29	vector equationlines
33-L30	vector equationcircles
34- L31	Problem Discussions
35- L32	curl of a vector point function.
36- L33	curl of a vector point function.
37- L34	Unit III Integration of point function
38-L35	Line integrals
39- L36	Line integrals
40- L37	Surface integrals
41- L38	Laplacian operator
42-P3	**Department Seminar**
43- L39	Laplacian operator
44- L40	Limit of a vector function
45- L41	Limit of a vector function
46- L42	Differentiation of vector
47- L43	Differentiation of vector- **Allotting portion for Internal Test-II**
	Internal Test II begins(22-08-2016)
48- L44	Unit VI Volume integrals
49-IT-II	**Internal Test-II**
50-L45	Volume integrals
51- L46	Cylinderical- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Cylinderical
53- L48	Problem Discussions
54- L49	Problem Discussions
55- L50	Gauss divergence theorem.
56- L51	Gauss divergence theorem.
57- L52	spherical polar coordinates
58- L53	spherical polar coordinates
59-P4	**College level meeting/ function**
60- L54	Unit V
61- L55	Green's theorem in plane
62- L56	Green's theorem in plane
63- L57	Green's theorem in plane
64- L58	Gauss divergence theorem. **Allotting portion for Internal Test-III**
	Internal Test III begins(03-10-2016)
65- L59	Green's theorem in plane
66- L60	Stoke's theorem
67-IT-III	**Internal Test-III**
68- L61	Stoke's theorem
69- L62	Stoke's theorem
70- L63	integral theorem Operational meaning of ∇, ∇o, $\nabla\times$ in terms of surface integrals. **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test17-10-2016**
72-MT	**Model Test**

73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course "<Vector Calculus>"
CO1	Compute dot and cross products. Utilize these concepts to interpret geometrical properties of two or three dimensional objects
CO2	Analyse the differentiability of the functions by defining gradient, divergent and curl.
CO3	Demonstrate the interdependency of gradient, divergent and curl by making use of relevant theorems.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Differntial equation and fourier series
Course Code	**GMMA22**
Class	I year (2015-2016)
Semester	Even
Staff Name	G.S.Grace Prema V.Selvan
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- This course develops among the students, the mathematical skills required to study physics.

Syllabus

Differential Equations and Fourier Series (75 hrs)

Text: 1. Calculus (Volume III), S.Narayanan and T.K.Manicavachagom Pillay, S.Viswanathan (Printers Publishers) Pvt. Ltd**.**

Unit 1: First order but of higher degree differential equations-solvable for p, x, y-Clairaut's form**.**

(Chapter 1-Sections 5 to 7)

Unit 2: Linear differential equations of second order with constant coefficientsParticular integrals of functions of the form ax e , sinax, cosax, xn, ax e f(x) and xn f(x).

(Chapter 2-Sections 1 to 4)

Unit 3: Linear differential equation of second order with variable coefficientshomogeneous equations-equation reducible to homogeneous equations-method of variation of parameters**.**

(Chapter 2-Sections 8 to 10)

Unit 4: Laplace transforms-Inverse Laplace transforms-solving linear differential equations and simultaneous equations of first order using Laplace transforms.

(Chapter 5-Sections 1 to 9)

Unit 5: Fourier series-half range sine and cosine series**.**

(Chapter 6-Sections 1 to 6)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 02-12-2015
1-L1	Unit-I Introduction
2-L2	Equations solvable for $\frac{dy}{dx}$
3- L3	Problems
4-L4	Equations solvable for y
5-L5	Equations solvable for x and problems
6-L6	Solving problems
7-L7	Clairault's form
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Problems on Clairault's form
10- L9	Equations homogeneous in x and y
11-L10	Solving examples
12-L11	problems
13-L12	Solving exercise problems
14-L13	Solving exercise problems
15-L14	Unit –II Introduction
16-L15	Definitions – linear equation with constant coefficients
17- L16	Definitions – complementary function and the operator D
18- L17	Complementary function of a linear equation with constants coefficients
19- L18	Examples
20- L19	General method of finding particular integral
21- L20	Problems for particular integral in general method - **Allotting portion for Internal Test-I**
	Internal Test I begins (25-01-2016)
22- L21	Special methods for finding particular integral
23- IT-1	**Internal Test-I**
24- L22	Particular integrals of functions of the for the form e^{ax}
25- L23	Particular integrals of functions of the for the form sinax,cosax
26- L24	Particular integrals of functions of the for the form x^n - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Particular integrals of functions of the for the form e^{ax} f(x)
28- L26	Particular integrals of functions of the for the form x^n f(x)
29- L27	Unit-III Introduction – linear equation with variable coefficients
30- P2	**College level meeting/Cell function**
31-L28	Methods for transforming the linear equation with constant coefficients

32-L29	To find the particular integral
33-L30	Special method of evaluating the particular integral when x is of the form x^m
34- L31	Examples
35- L32	Solving exercise problems
36- L33	Equations reducible to the linear equations
37- L34	Solving examples
38- L35	Solving examples
39- L36	Solving exercise problems in equation reducible to homogenous equation
40- L37	Solving exercise problems in equation reduciable to homogenous equation
41- L38	Method of variation of parameters
42-P3	**Department Seminar**
43- L39	**Unit-IV** Introduction
44- L40	The laplace transforms- definitions, operator
45- L41	Definitions piecewise continuity, exitence of the laplace transform
46- L42	Solving problems for laplace transform
47- L43	Inverse laplace transform- definitions , results- **Allotting portion for Internal Test-II**
	Internal Test II begins (22-02-2016)
48- L44	Results for inverse laplace transform
49-IT-II	**Internal Test-II**
50-L45	Results for inverse laplace transform
51- L46	solving problems for inverse laplace transform - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Exercise problems in inverse Laplace transform
53- L48	Solution of differential equation using Laplace transform
54- L49	Problems in solution of differential equation using laplace transform
55- L50	Solving simultaneous equation of first order using laplace transform
56- L51	Problems
57- L52	Unit-V Introduction
58- L53	Fourier series- half range
59-P4	**College level meeting/ function**
60- L54	Half range sine series
61- L55	Problems for fourier sine series
62- L56	Exercise problems for half range sine series
63- L57	Half range cosine series
64- L58	Solved problems for half range cosine series- **Allotting portion for Internal Test-III**
	Internal Test III begins(28-03-2016)
65- L59	Solved problems for half range cosine series
66- L60	Exercises problems for half range cosine series
67-IT-III	**Internal Test-III**
68- L61	Exercises for half range cosine series
69- L62	Exercises problems for half range sine series
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (11-04-2016)**
72-MT	**Model Test**

73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Differential equation and Fourier series"
CO1	End of this course, the students should gain the knowledge about the method of solving Differential Equations.
CO2	Distinguish between linear, nonlinear, partial and ordinary differential equations and solve homogeneous, non homogeneous, linear and exact differential equations.
CO3	Solve second order differential equation with constant, variable and polynomial coefficients.
CO4	Classify and solve the partial differential equations of standard types.
CO5	Explain the relationship between Fourier series and linear time-invariant system.
CO6	Formulate recurrence relations for Legendre and Hermite differential equations.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Abstract Algebra
Course Code	**GMMA41**
Class	II year (2015-2016)
Semester	Even
Staff Name	J. Vijaya Xavier Parthipan
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- This is a basic course for any student aspiring to complete B.Sc., degree in Mathematics. The essence of mathematical logics and its ramifications in the study of mathematics is introduced. Basic properties of sets which are needed for the study of algebra are introduced. The students are exposed to the basic algebraic structure called group. Subsequently the properties of groups and imbedding a group in a bigger group called the group of symmetries are dealt with. The algebraic equivalence of any two groups is studied by means of isomorphism

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 02-12-2015
1-L1	UNIT-I Introduction on Relation
2-L2	Relation- definition and Examples
3- L3	Equivalence Relation
4-L4	Symmetric, reflexive, transitive
5-L5	Equivalence class- definition and Examples
6-L6	Equivalence Relation Theorems.
7-L7	Solved problems from Equivalence Relations
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Functions
10- L9	Types of Functions and Examples
11-L10	One-one, onto definition and Examples
12-L11	Restriction, composite definition and Examples
13-L12	Theorems on compositions
14-L13	Solved problems and Theorems from Bijection
15-L14	UNIT – II Permutation Groups
16-L15	Definition on symmetric group and order of G
17- L16	Cycle of length examples and note
18- L17	Theorems and examples from disjoint
19- L18	Theorems on permutation
20- L19	Theorems on even, odd permutation
21- L20	Introduction on Cyclic groups- **Allotting portion for Internal Test-I**
	Internal Test I begins (25-01-2016)
22- L21	Cyclic groups Theorems and Examples
23- IT-1	**Internal Test-I**
24- L22	Order of an element
25- L23	Theorems and corollary and Solved problems
26- L24	Cosets and Lagrange's Theorem- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Theorems about subgroups
28- L26	Examples and Solved problems
29- L27	UNIT – III Introduction on Normal subgroups and Quotient Groups
30- P2	**College level meeting/Cell function**
31-L28	Normal subgroups Theorems
32-L29	Some Solved problems on Normal subgroups
33-L30	Definition on Quotient Groups
34- L31	Introduction on Isomorphism and Isomorphic
35- L32	Theorems and Examples on Isomorphism
36- L33	Remark and Theorems on Isomorphism

37- L34	Solved problems on Isomorphism
38-L35	Cayley's Theorem
39- L36	Definition on automorphism, inner automorphism
40- L37	Note and Solved problems on automorphism
41- L38	Introduction on Homomorphism's
42-P3	**Department Seminar**
43- L39	Theorems on Homomorphism's
44- L40	Kernal 's on Theorems
45- L41	Fundamental Theorem of Homomorphism
46- L42	UNIT – IV Definitions and examples on Ring
47- L43	Elementary properties of rings- **Allotting portion for Internal Test-II**
	Internal Test II begins (22-02-2016)
48- L44	Note and Solved problems on rings
49-IT-II	**Internal Test-II**
50-L45	Isomorphism Definition and examples
51- L46	Types of rings- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Rings with identity- Definition
53- L48	Theorem on rings with identity
54- L49	Skew field
55- L50	Theorems and Solved problems on rings
56- L51	Characteristic of a rings
57- L52	Definition on Subrings
58- L53	Solved problems on Subrings
59-P4	**College level meeting/ function**
60- L54	Subfield - Theorems
61- L55	UNIT – V Introduction on Ideals
62- L56	Principal ideal generated by a ideal
63- L57	Theorems on ideal
64- L58	Principal ideal domain examples - **Allotting portion for Internal Test-III**
	Internal Test III begins (28-03-2016)
65- L59	Introduction on Quotient rings
66- L60	Quotient rings of R modulo I
67-IT-III	**Internal Test-III**
68- L61	Solved problems on Quotient rings
69- L62	Introduction on Maximal ideal
70- L63	Theorems on Maximal ideal **-Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (11-04-2016)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	Prime ideal and corollary**Model test paper distribution and previous year university question paper discussion**
75-L65	The fundamental theorem of homomorphism **-Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course Abstract Algebra
CO1	get familiar with group and its related topics
CO2	get a clear idea about homomorphism, isomorphism
CO3	have basic knowledge of ring and its related topics
CO4	get confidence to face any questions related with groups and rings
CO5	appreciate pure mathematics

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Complex Analysis
Course Code	**GMMA61**
Class	III year (2015-2016)
Semester	Even
Staff Name	G.Jeya Kumar
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Complex analysis, traditionally known as the theory of functions of a complex variable, is the branch of mathematical analysis that investigates functions of complex numbers.
- It is useful in many branches of mathematics, including algebraic geometry, number theory, analytic combinatorics, applied mathematics; as well as in physics, including hydrodynamics and thermodynamics and also in engineering.

Syllabus

Complex Analysis (90 Hrs)
Text: Complex Analysis by Dr.S.Arumugam and Others, Scitech Publications.

Unit 1: Complex numbers-nth 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- $f(\cos\theta, \sin\theta)d\theta$only.

(Chapter 7: Sections 7.2, 7.4 and Chapter 8: Sections 8.1 to 8.3)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 02-12-2015
1-L1	UNIT-I Functions of a complex variable
2-L2	Definition of limits
3- L3	Definition of Conjugation and modulus
4-L4	Solved problems on conjugation and modulus
5-L5	Definition of Inequality
6-L6	Definition of Square root
7-L7	Solved problems on square root
8-L8	Definition of Geometrical Representation of complex number
9-L9	Polar form of a complex number
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Definition of n^{th} roots of complex numbers.
12-L11	Exercise problems on Geometrical Representation of complex number
13-L12	Definition of Straight lines and Circle
14-L13	Regions in the complex plane
15-L14	Example of Regions in the complex plane
16-L15	The Extended complex plane
17-L16	Solved problems on The Extended complex plane
18-L17	UNIT-II Definition of Analytic functions
19-L18	Exercise problems on Analytic functions
20-L19	Limits and definition
21-L20	Examples of limits
22-L21	Theorems on limit
23-L22	Exercise problems on limits - **Allotting portion for Internal Test-I**
	Internal Test I begins(25-01-2016)
24-L23	Definition of Continuous functions
25-L24	Definition of Differentiability
26-IT-1	**Internal Test-I**
27-L25	Exercise problems on Differentiability
28-L26	Theorem of Cauchy- Riemann Equations
29-L27	Examples of Cauchy- Riemann Equations

30-L28	Alternate form of Cauchy- Riemann Equations - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Definition of Analytic functions
32- L30	Solved problems on Analytic functions
33- L31	Definition of Harmonic functions
34-P2	**College level meeting/Cell function**
35- L32	Milne-Thompson method
36- L33	UNIT-III Definition of Bilinear transformations
37- L34	Definition of Elementary transformations
38- L35	Solved problems on Elementary transformations
39- L36	Definition of Bilinear or Mobius transformation
40- L37	Theorems on Bilinear transformations
41- L38	Solved problems on Bilinear transformations
42- L39	Definition of Cross ratio
43- L40	Solved problems on Cross ratio
44- L41	Exercise problems on Cross ratio
45- L42	Fixed points of Bilinear transformations
46- L43	Theorems on Bilinear transformations
47- L44	Solved problems on Bilinear transformations
48- L45	Exercise problems on Bilinear transformations
49- L46	UNIT-IV Definition of Definite integral
50- L47	Definition of integral
51- P3	**Department Seminar**
52- L48	Solved problems on Definite integral
53- L49	Cauchy’s theorem
54- L50	Definition of Cauchy’s theorem
55- L51	Cauchy’s theorem for multiply connected region
56-L52	Cauchy’s integral formula- **Allotting portion for Internal Test-II**
	Internal Test II begins(22-02-2016)
57-L53	Maximum Modulus theorem
58-L54	Solved problems on Maximum Modulus
59-IT-II	**Internal Test-II**
60- L55	Definition of Higher derivatives
61- L56	Liouville’s Theorem- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Solved problems on Higher derivatives
63- L58	Definition of Taylor’s series
64- L59	Examples on Taylor’s series
65- L60	Solved problems on Taylor’s series
66- L61	Exercise problems on Taylor’s series
67- L62	UNIT – V Definition of Laurent’s series
68- L63	Laurent’s theorem
69- L64	Solved problems on Laurent’s series
70- L65	Definition of Singularities
71- L66	Examples of Singularities
72- L67	Theorem on Singularities
73- L68	Solved problems on Singularities

74-P4	**College level meeting/ function**
75- L69	Definition of Residues
76- L70	Solved problems on Residues
77- L71	Cauchy's Residue theorem
78- L72	Argument theorem
79- L73	Roche's theorem- **Allotting portion for Internal Test-III**
	Internal Test III begins(28-03-2016)
80- L74	Solved problems on Residues
81- L75	Evaluation of Definite integrals
82-IT-III	**Internal Test-III**
83- L76	Solved problems on Definite integrals
84- L77	Exercise problems on Definite integrals - **Test Paper distribution and result analysis**
85- L78	Solved problems on Definite integrals
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test(11-04-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course Complex Analysis
CO1	Explain the geometry of complex numbers. Demonstrate bilinear transformation as composition of elementary transformations. Compile the relation between bilinear transformation and cross ratio.
CO2	Differentiate differentiability and analyticity. Characterize analytic function with Cauchy Riemann equations and further properties of partial derivatives.
CO3	Outline the procedure for integration of complex functions. Use Cauchy's integral formula and its consequences to prove most important theorems.
CO4	Compute power series expansion in connected region, annular region of an analytic function.
CO5	Identify different types of singularities and poles, calculate the residue. Use contour integration to find integrals of real valued functions of certain type.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	LINEAR PROGRAMMING
Course Code	**GMMA62**
Class	III year (2015-2016)
Semester	Even
Staff Name	J VIJAYA XAVIER PARITHIPAN
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- This course aims to develop students to use quantitative methods and techniques for effective decision making, mathematical model formulation and applications that are used in solving real life problems.

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 02-12-2015
1-L1	Introduction of linear programming Problems
2-L2	Formation of linear programming problem.
3- L3	Solved problems in LPP.
4-L4	Exercise problem in LLPP.
5-L5	Mathematical formulation of a LPP.
6-L6	LPP in summation Notation and Matrix Form.
7-L7	Canonical form in Linear programming problem
8-L8	Remarks in LPP.
9-L9	Standard form of LPP.
10-P1	**Inauguration of Mathematics Association**
11-L10	Solved problems.
12-L11	Solved problems to find basic feasible solution.
13-L12	Theorems on basic feasible solutions.
14-L13	Theorems on basic feasible solutions.
15-L14	Notations and illustration of the problems
16-L15	Solved and exercise problems.
17-L16	Introduction of Graphical method.
18-L17	Non-negative constrains and constrains of the form ax_1+ax_2
19-L18	Optimizing objective function and its methods.
20-L19	Solved problems in Graphical method.
21-L20	Exercise problems in Graphical method.
22-L21	Introduction of Simplex method.
23-L22	Steps to solve simplex method. - **Allotting portion for Internal Test-I**
	Internal Test I begins(25-01-2016)

24-L23	Solved and exercise problems using simplex method.
25-L24	Problems based on unbounded solutions.
26-IT-1	**Internal Test-I**
27-L25	UNIT-II Introduction of Big M-method.
28-L26	Examples for the Big M- method.
29-L27	Algorithm for Big M- method.
30-L28	Solved problems in Big M- method. - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Exercise problems in Big M- method.
32- L30	Problems in Big M- method.
33- L31	Introduction to Two phase method
34-P2	**College level meeting/Cell function**
35- L32	Problems based on phase –I methods
36- L33	Problems based on phase – II methods.
37- L34	Exercise and Solved problems in 2-phase method.
38- L35	Applications of simplex method.
39- L36	Solution of simultaneous linear equations for simplex method.
40- L37	Problems based on it
41- L38	Inverting a non-singular matrix by simplex method
42- L39	Problems based on it.
43- L40	Introduction of Primal and dual.
44- L41	Lemma and remarks.
45- L42	Fundamental theorem of Duality.
46- L43	Algorithm of Dual Simplex method.
47- L44	Problems based on it.
48- L45	UNIT- III Introduction of Transportation problems.
49- L46	Mathematical formulation and Definition of TP
50- L47	Remark and Theorems in TP
51- P3	**Department Seminar**
52- L48	Dual of a Transportation problem.
53- L49	Solution algorithm for Transportation problem.
54- L50	Algorithm of North West Corner rule.
55- L51	Problems on North West Corner rule.
56-L52	Algorithm of Row Minima Method- **Allotting portion for Internal Test-II**
	Internal Test II begins(22-02-2016)
57-L53	Problems on Row Minima Method
58-L54	Algorithm of Column Minima Method
59-IT-II	**Internal Test-II**
60- L55	Problems on Column Minima Method
61- L56	Algorithm of Least Cost Method. - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems on least cost method.
63- L58	Algorithm of Vogel Approximation method.
64- L59	Problems on Vogel Approximation method.
65- L60	Determiningthe entering and leaving variable.
66- L61	Degeneracy in TP and MODI method.
67- L62	Problems based on MODI method.

68- L63	**UNIT-IV** Introducation of Assignment Problem
69- L64	Mathematical formulation and solution to assignment problem
70- L65	Hungarian Algorithm for solving Assignment problems
71- L66	Exercise and problems in Assignment problems
72- L67	Theorems and problems in Assignment problems
73- L68	UNIT-V Introduction to sequencing.
74-P4	**College level meeting/ function**
75- L69	Introduction of processing Jobs in 2 machine
76- L70	Algorithm and problems based on it.
77- L71	Introduction of processing n Jobs in m machine.
78- L72	Algorithm and problems based on it.
79- L73	Introduction of processing 2 jobs in ma machine. - **Allotting portion for Internal Test-III**
	Internal Test III begins (28-03-2016)
80- L74	Introduction of Graphical method
81- L75	Algorithm on Graphical method
82-IT-III	**Internal Test-III**
83- L76	Problems on Graphical method
84- L77	Exercise and problems - **Test Paper distribution and result analysis**
85- L78	Exercise and problems on Graphical method.
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (11-04-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course Linear Programming Problems
CO1	Enable the students to solve real life problems in Business Management.
CO2	Formulate Linear Programming Problem (LPP), find its solution by graphical method and identify the special cases of solution.
CO3	Predict solutions of different types of LPP using appropriate methods, namely, simplex, Big M and two-phase method.
CO4	Exploit the concept of dual simplex method and solve LPP.
CO5	Solve transportation and assignment problems using primal dual algorithm and extend it for special cases.
CO6	Propose the best strategy in a game using different decision making tools.

CO7	Demonstrate the use of simplex method in analyzing the sensitivity of the optimal solution in terms of change in the cost vector/ requirement vector/coefficient matrix/addition or deletion of variable.
CO8	Get interest in Management studies

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Mechanics
Course Code	**GMMA63**
Class	III year (2015-2016)
Semester	Even
Staff Name	T Stalin Alexis
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The course mainly deals with two major areas of applied mathematics namely Statics and Dynamics.
- Statics is the branch of mechanics that is concerned with the analysis of loads (force and torque, or "moment") acting on physical systems that do not experience an acceleration (a=0), but rather, are in static equilibrium with their environment.
- Whereas the dynamics is a branch of applied mathematics (specifically classical mechanics) concerned with the study of forces and torques and their effect on motion.
- Brief introduction to central forces to the learners becomes essential as we live in the era of satellites, missiles and space explorations.

Syllabus

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: Sections10.1, 10.2)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 02-12-2015
1-L1	UNIT – I Introduction
2-L2	Forces acting at a point
3- L3	Parallelogram law of forces
4-L4	Exercise Problems 1,2
5-L5	Triangle of forces
6-L6	The polygon of forces
7-L7	Lami's theorem
8-L8	Exercise Problems
9-L9	Find the resultant of any number of coplanar places
10-P1	**Inauguration of Mathematics Association**
11-L10	Parallel forces & moments
12-L11	Unit of moment &Valigen's theorem
13-L12	Exercise problems 1,2
14-L13	Moment of a force about on axis
15-L14	Unit – II Equilibrium of forces
16-L15	Equilibrium of three forces acting on a rigid body
17-L16	Coplanar forces
18-L17	Trignometrical theorems
19-L18	Example problem 1 , 2
20-L19	Friction laws of friction
21-L20	Coefficient and Angle of friction
22-L21	Equilibrium of a particle on a inclined plane
23-L22	Equilibrium of a particle on a inclined plane under a parallel force **Allotting portion for Internal Test-I**
	Internal Test I begins(25-01-2016)
24-L23	Equilibrium of a body on a inclined plane under any force
25-L24	Exercise problem 3, 4
26-IT-1	**Internal Test-I**
27-L25	Problems of parallel forces
28-L26	Unit – III Projectiles introduction
29-L27	Definitions and fundamental principles

30-L28	Show that the path of the projectile is parabola -**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Characteristics of the motion of the projectile
32- L30	Worked examples 1,2
33- L31	Determine the horizontal range of a projectile
34-P2	**College level meeting/Cell function**
35- L32	Velocity of the projectile at time t
36- L33	Example problem 40, 42
37- L34	Range on an inclined plane
38- L35	Range on an inclined plane is maximum
39- L36	Time of flight
40- L37	Greatest distance S of the projectile from the inclined plane
41- L38	Time taken to reach the greatest distance
42- L39	Initial velocity of projection
43- L40	Example problems 43, 44
44- L41	Enveloping parabola
45- L42	Exercise problems 1, 2
46- L43	Unit – IV Simple harmonic motion
47- L44	SHM in a straight line
48- L45	General solution of the SHM
49- L46	Geometrical representation of SHM
50- L47	Example problem 1, 2
51- P3	**Department Seminar**
52- L48	Composition of 2 SHM of the same period in a straight line
53- L49	Composition of 2 SHM of the same period in a directions
54- L50	Example problem 22, 23
55- L51	SHM on a curve
56-L52	Period of oscillation of a simple pendulum - **Allotting portion for Internal Test-II**
	Internal Test II begins(22-02-2016)
57-L53	Simple equivalent pendulum
58-L54	Seconds pendulum
59-IT-II	**Internal Test-II**
60- L55	Loss or gain of oscillation made by a pendulum
61- L56	Example problem 27, 28 **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Unit – V motion under the action of central forces
63- L58	Velocity and acceleration in polar co-ordinates
64- L59	Example problem 1,2
65- L60	Differential equation of central orbit in polar co-ordinates
66- L61	Perpendicular from the pole on the tangent
67- L62	Pedal equation of the central orbit
68- L63	Pedal equation of standard curves
69- L64	Example problem 13, 14
70- L65	Velocities in a central orbit
71- L66	Two fold problems in central orbits

72- L67	Example problems 15, 16
73- L68	Apses and apsidal distance
74-P4	**College level meeting/ function**
75- L69	Law of the inverse square
76- L70	Example problems 34,35
77- L71	Law of the inverse principle
78- L72	SHM in a straight angle
79- L73	General solution of the SHM **Allotting portion for Internal Test-III**
	Internal Test III begins(28-03-2016)
80- L74	Geometrical representation of SHM law
81- L75	Apses and apsidal distance
82-IT-III	**Internal Test-III**
83- L76	Two fold problems in central orbits
84- L77	Solved problems - **Test Paper distribution and result analysis**
85- L78	Exercise problems
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (11-04-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course Mechanics
CO1	Learners will gain knowledge about Mechanics of particle and Mechanics of a system of particles with constraints.
CO2	Acquisition of knowledge about D'Alembert's Principle, Lagrange's equation and Hamilton's Principle.
CO3	Outline basics that are governing system of forces.
CO4	explain the idea of couples and illustrate equilibrium of three forces acting on a rigid body in appropriate physical systems. .
CO5	Examine resultant of coplanar forces under various circumstances. Define and apply the concept of friction
CO6	Define principles of conservation of momentum and apply the concept of direct impact and oblique impact in collision of objects.
CO7	Describe the orbit of a moving particle under the action of central forces and compute moment of inertia.
CO8	Enable the students with the basic knowledge of equilibrium of a particle. Enable the students to develop a working knowledge to handle practical problems.
CO9	Knowledge gained about one-body problem, the virial theorem and

	the Kepler problem.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Graph Theory
Course Code	**GMMA64**
Class	III year (2015-2016)
Semester	Even
Staff Name	G. Jeya Kumar
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- A graph is a symbolic representation of a network and of its connectivity. It implies an abstraction of the reality so it can be simplified as a set of linked nodes.
- Graph theory is a branch of mathematics concerned about how networks can be encoded and their properties measured.
- It has been enriched in the last decades by growing influences from studies of social and complex networks.
- The origins of graph theory can be traced to Leonhard Euler who devised in 1735 a problem that came to be known as the "Seven Bridges of Konigsberg.

Syllabus

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: Sections10.1, 10.2)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 02-12-2015
1-L1	Unit-1 Introduction
2-L2	Definitions and examples of Graph
3- L3	Degrees
4-L4	Problems
5-L5	Sub graphs
6-L6	Spanning sub graph
7-L7	Definitions and examples of spanning sub graph
8-L8	Isomorphism
9-L9	Definitions of automorphism and remark
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Ulam's conjecture and problems
12-L11	Ramsey numbers
13-L12	Problems of Ramsey number
14-L13	Independent sets and coverings
15-L14	Intersection graphs and line graphs
16-L15	Matrices
17-L16	Operations on graphs
18-L17	Unit-2 Degree sequence
19-L18	Examples and problems
20-L19	Graphic sequences

21-L20	Definition and theorem
22-L21	Algorithm and theorem
23-L22	Definition- walk, trails and paths- **Allotting portion for Internal Test-I**
	Internal Test I begins (25-01-2016)
24-L23	Length of the walk and examples
25-L24	Theorems
26-IT-1	**Internal Test-I**
27-L25	Connected- definition and examples
28-L26	Connectedness related theorems
29-L27	Bipartite-Definition and theorems
30-L28	Definition of cut point, disconnected graph, Bridge - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Blocks- Definitions related examples
32- L30	Theorems on Blocks
33- L31	Definition of connectivity and examples
34-P2	**College level meeting/Cell function**
35- L32	Definition of n-connected, n-line connected
36- L33	Problems related k-connected graph
37- L34	Problems in k-connected graph
38- L35	Problems in k-connected graph
39- L36	Book back one words
40- L37	Unit-3 Introduction
41- L38	Definition of Eulerian and lemma
42- L39	Eulerian related theorem and corollary
43- L40	Fleury's algorithm
44-L41	Definition – Hamiltonian cycle
45- L42	Hamiltonian graph and examples
46- L43	Definition-theta graph and theorems
47- L44	Theorem –Necessary condition for a graph to be Hamiltonian
48- L45	Dirac 's theorem
49- L46	Problems for non-Hamiltonian
50- L47	Definition-Acyclic graph, Tree, examples
51- P3	**Department Seminar**
52- L48	Theorems related to tree
53- L49	Definition – spanning tree and theorem
54- L50	Definition- Eccentricity, radius r(G), examples
55- L51	Definitions-centres of G, and theorems
56-L52	Book back one word- **Allotting portion for Internal Test-II**
	Internal Test II begins(22-02-2016)
57-L53	Unit-4 Definition- planarity and example
58-L54	Definition – Non planar and theorem
59-IT-II	**Internal Test-II**
60- L55	Theorems related to embedding plane
61- L56	Theorems-Euler's polyhedron formula- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Corollary related to plane graph

63- L58	Definition- Maximal planar, corollary
64- L59	Definition- Elementary subdivision, Homeomorphic and examples
65- L60	Problems related to homeomorphic
66- L61	Definition- Colourability, example, chromatic numb
67- L62	Definition- Chromatic partitioning, examples
68- L63	Definition- uniquely colourable, theorems
69- L64	Definition- Edge colouring, Edge chromatic number
70- L65	Theorem related to edge chromatic number
71- L66	Unit-5 Five Colour theorem
72- L67	Chromatic polynomials , theorem
73- L68	Problems related to chromatic polynomial
74-P4	**College level meeting/function**
75- L69	Definition- Directed graph, Indegree
76- L70	Definition- Isomorphism and Directed walk
77- L71	Examples
78- L72	Definitions- length, directed cycle
79- L73	Definitions- **Allotting portion for Internal Test-III (28-03-2016)**
	Internal Test III begins 28.3.2016
80- L74	Definitions- reachable, unilateral
81- L75	Definition- Strongly connected and theorem
82-IT-III	**Internal Test-III**
83- L76	Definition- Eulerian trail, Eulerian
84- L77	Theorem related to Eulerian - **Test Paper distribution and result analysis**
85- L78	Theorem related to Eulerian
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (11-04-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course Graph Theory
CO1	Demonstrate graphs with examples and represent a graph by matrices.
CO2	Identify and construct Eulerian and Hamiltonian graphs.
CO3	Describe the properties of trees and able to examine minimal spanning tree for a given weighted graph.
CO4	discuss colouring concept of vertices and edges of a graph
CO5	Analyze planar graphs and its properties, and classify the connectedness of directed graph.
CO6	Gain the skills to apply the theory to solve various mathematical problems.
CO7	Have an in-depth knowledge of colouring and planarity.

CO8	Know the methods of representing networks in computer science and other fields.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	NUMERICAL METHODS
Course Code	**GSMA3A**
Class	II year (2015-2016)
Semester	Even
Staff Name	A.AlwynAsir
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- The aim of this course is to enable the students to acquire basic tools in numerical and statistical methods for solving real life problems in business, industry, agriculture and medicine**.**

Syllabus

Numerical Methods

Text: Numerical Analysis by Dr.S.Arumugam and Isac.

Unit 1: Simultaneous equations-back subsititution-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 operatos-Other difference operators-Newton‘s interpolation-Central Difference Interpolation formula.

(Chapter 3: Section3.1, 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 50)

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)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 02-12-2015
1-L1	UNIT-I Introduction on Simultaneous equations
2-L2	Notes on Simultaneous equations
3- L3	Introduction on Back substitution method
4-L4	Introduction on Gauss Elimination method
5-L5	Gauss – Jordan Elimination method
6-L6	Problems on Gauss Elimination method
7-L7	Problems on Gauss – Jordan Elimination method
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Calculation of inverse of a matrix
10- L9	Gauss – Seidal Iteration method
11-L10	Problems on Gauss – Seidal Iteration method
12-L11	UNIT-II Introduction on Difference operators
13-L12	Properties of the operator Δ
14-L13	Introduction on Forward and Backward differences
15-L14	Introduction on Central differences operator **Allotting portion for Internal Test-I**
	Internal Test I begins (25-01-2016)
16-L15	Problems on Forward, Backward Central differences
17-IT-1	**Internal Test-I**
18-L16	Other difference operators- Theorems and operators
19-L17	Newton’s Forward and Backward Interpolation formula. - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Gauss Forward and Backward Interpolation formula.
21- L19	Stirling’s formula and Problems
22- P2	**College level meeting/Cell function**
23-L20	UNIT-III Lagrange’s interpolation formula
24-L21	Problems on Lagrange’s interpolation formula
25-L22	Divided difference derivation and example
26-L23	Relation between Divided difference and forward difference
27-L24	Problems using Divided difference formula
28-L25	Newton’s Divided difference formula

29-L26	Problems using Newton's Divided difference formula
30-L27	Inverse interpolation - Lagrange's method
31-L28	Introduction on Iterative method
32-L29	Problems on Iterative method
33-L30	UNIT-IV Introduction on Numerical differentiation
34- P3	**Department Seminar**
35-L31	Derivatives using Newton's forward difference formula
36-L32	Derivatives using Newton's backward difference formula - **Allotting portion for Internal Test-II**
	Internal Test II begins (22-02-2016)
37- L33	Derivatives using Stirling's formula
38- IT-II	**Internal Test-II**
39-L34	Introduction on Maxima and minima of the interpolation polynomial
40-L35	Problems using Newton's forward difference formula -**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Problems using Newton's backward difference formula
42- L37	Stirling's formula derivative Problems
43- L38	Maxima and minima Problems
44- P4	**College level meeting/ function**
45-L39	Maxima and minima Problem
46-L40	UNIT-V Introduction
47-L41	Numerical Integration introduction
48-L42	Newton's cote's quadrature formula
49-L43	Trapezoidal rule derivation and Geometrical representation
50-L44	Simpson's one – third rule - **Allotting portion for Internal Test-III**
	Internal Test III begins(28-03-2016)
51 L45	Simpson's three – eight rule
52- L46	Error's in Trapezoidal and Simpson's rule
53-IT-III	**Internal Test-III**
54-L47	Problems using Trapezoidal and Simpson's rule
55-L48	Problems using Simpson's three – eight rule -**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test(11-04-2016)**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course “Numerical methods “
CO1	Demonstrate various numerical methods and use them to solve algebraic, transcendental and system of linear equations.
CO2	Identify interpolations on equal/unequal intervals and solve relevant problems using appropriate methods.
CO3	Use numerical methods with various mathematical operations such as differentiation and integration
CO4	Demonstrate to obtain measures of central tendencies /dispersion with examples.
CO5	Apply the basic probability rules to solve problems and calculate correlations.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

`St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Statistics I
Course Code	**GAST11**
Class	I year (2015-2016)
Semester	Odd
Staff Name	T Santhakumari V.Selvan
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The objective of the course is to enable the students to understand the theoretical background of statistics as a student of Mathematics.
- The course essentially deals with the probability distribution theory which is the basis of statistics.
- The topics covered includes Correlation and Regression and curve fitting.

Syllabus

Statistics-I
Text : Statistics, S. Arumugam and Others.

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, Regression, Regression coefficient and properties-Rank correlation.

Unit III: Association of attributes, Consistency of data-Criteria for independence-Yule's coefficient of association.

Unit IV:
Discrete Probability Distributions:
Geometric, Binomial and Poisson distributions-Their moments, generating function, Characteristic function, Properties and simple application.

Unit V:
Continuous Probability Distributions:
Bet1 1 and Beta 2 and Gamma distributions-Normal Distribution-Standard Normal Distribution-Their Properties-Simple Problems-Importance of Normal Distribution.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2015
1-L1	Unit-1 Moments skewness and Kurtosis :Definitions and theorems
2-L2	Skewness and Kurtosis – Basic definitions
3- L3	Solved problems of skewness and kurtosis
4-L4	Exercise problems of skewness and kurtosis
5-L5	Exercise problems of skewness and kurtosis
6-L6	Exercise problems of skewness and kurtosis
7-L7	Curve fitting- Principles of least square, Fitting straight line and second degree parabola
8-L8	Solved problems of curve fitting
9-L9	Exercise problems of curve fitting
10-P1	**Inauguration of Mathematics Association**
11-L10	Exercise problems of curve fitting
12-L11	Unit-2 Correlation and Regression Definitions and Examples
13-L12	Theorems of correlation and regression
14-L13	Notes and Solved problems of correlation and regression
15-L14	Solved problems of correlation and regression
16-L15	Exercise problems of correlation and regression
17-L16	Exercise problems of correlation and regression
18-L17	Rank correlation: Theorem and some notes
19-L18	Solved problems of rank correlation
20-L19	Exercise problems of rank correlation
21-L20	Exercise problems of rank correlation
22-L21	Exercise problems of rank correlation
23-L22	Regression: Definitions and theorems - **Allotting portion for Internal Test-I**
	Internal Test I begins (20.07.2015)
24-L23	Coefficient for a Theorems and notes
25-L24	Solved problems of regression
26-IT-1	**Internal Test-I**
27-L25	Solved problems of regression
28-L26	Exercise problems of regression

29-L27	Exercise problems of regression
30-L28	Exercise problems of regression - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Correlation coefficient for a Bivariate frequency distribution: Definitions
32- L30	Solved problems of correlation coefficient
33- L31	Solved problems of correlation coefficient
34-P2	**College level meeting/Cell function**
35- L32	Exercise problems of correlation coefficient
36- L33	Exercise problems of correlation coefficient
37- L34	Unit-3 Theory of Attributes: Definition and notes
38- L35	Theorem notes and Examples
39- L36	Solved problems of Attributes
40- L37	Solved problems of Attributes
41- L38	Exercise problems on Attributes
42- L39	Exercise problems on Attributes
43- L40	Exercise problems on Attributes
44- L41	Consistency of Data: Definition and Notes
45- L42	Solved problems of consistency of Data
46- L43	Solved problems of consistency of Data
47- L44	Exercise problems of consistency of Data
48- L45	Exercise problems of consistency of Data
49- L46	Exercise problems of consistency of Data
50- L47	Independence and association of Data: Introduction, Notation
51- P3	**Department Seminar**
52- L48	Notes and Solved problems of Association of Data
53- L49	Solved problems of Association of Data
54- L50	Exercise problems of Association of Data
55- L51	Exercise problems of Association of Data
56-L52	Exercise problems of Association of Data - **Allotting portion for Internal Test-II**
	Internal Test II begins (31.08.2015)
57-L53	Exercise problems of Association of Data
58-L54	Exercise problems of Association of Data
59-IT-II	**Internal Test-II**
60- L55	Unit-4 Binomial Distribution: Definitions and notes
61- L56	Binomial distribution theorems - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorems on Binomial Distribution
63- L58	Solved problems of Binomial Distribution
64- L59	Solved problems of Binomial Distribution
65- L60	Poisson Distribution: Definition and notes and theorem
66- L61	Solved problems of Poisson distribution
67- L62	Exercise problems of Poisson distribution
68- L63	Exercise problems of Poisson distribution
69- L64	Moment generating functions: Definition, notes and examples
70- L65	Some properties of generating function
71- L66	Solved problems on generating functions
72- L67	Exercise problems on generating functions

73- L68	Exercise problems on generating functions
74-P4	**College level meeting/ function**
75- L69	Characteristic function: Properties and Exercise problems
76- L70	Unit-5 Beta 1,2 and Gamma distribution Introduction
77- L71	Normal distribution: Mean variance and Notes
78- L72	Moments about mean of Normal Distribution
79- L73	Properties of Normal Distribution- **Allotting portion for Internal Test-III**
	Internal Test III begins (05.10.2015)
80- L74	Importance of Normal Distribution
81- L75	Solved problems of Normal Distribution
82-IT-III	**Internal Test-III**
83- L76	Solved problems of Normal Distribution
84- L77	Exercise problems of Normal Distribution- **Test Paper distribution and result analysis**
85- L78	Exercise problems of Normal Distribution
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (16.10.2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29.10.2015

Course Outcomes

Learning Outcomes	**COs** of the course Statistics I
CO1	Demonstrate with example a sample space. Outline the role of probability density function in determining the nature of probability
CO2	Apply the moment generating function to determine moments and the relation to mean, standard deviation and variance. Measure the dispersion of the data of any distribution by chebychev's inequality.
CO3	Identify and apply various distributions to solve problems.
CO4	Evaluate the relation between different data.
CO5	Fit the appropriate curve using the methods of least squares.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Combinatorial Mathematics
Course Code	**GMMA5B**
Class	IIIyear (2015-2016)
Semester	Oddq
Staff Name	G.JEYA KUMAR
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Combinatorics is a branch of mathematics concerning the study of finite or countable discrete structures.
- Aspects of combinatorics include counting the structures of a given kind and size (enumerative combinatorics), deciding when certain criteria can be met, and constructing and analyzing objects meeting the criteria.
- Many combinatorial questions have historically been considered in isolation, giving an adhoc solution to a problem arising in some mathematical context.
- In the later twentieth century, however, powerful and general theoretical methods were developed, making combinatorics into an independent branch of mathematics in its own right.
- Combinatorics is used frequently in computer science to obtain formulas and estimates in the analysis of algorithms

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2015
1-L1	Unit-1 Introduction
2-L2	Definition for colourings and examples
3- L3	Theorem for colouring
4-L4	Recurrence relation- definitions, examples and problems
5-L5	Permutation-Definition, Theorems
6-L6	Permutation related problems
7-L7	Definition for p(n,r) and problems
8-L8	Combination definition
9-L9	Combination related theorems and problems
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Pascal’s identity theorem
12-L11	Problems for Binomial theorem
13-L12	Exponential-Definition and theorem
14-L13	Problems on permutation
15-L14	Exercise problems of permutation
16-L15	Unit-2 Pairings definitions and examples
17-L16	Definition- vertices, edges, graph and example
18-L17	Perfect matching definitions
19-L18	Perfect matching examples
20-L19	Perfect matching Theorem
21-L20	Pairing between sets
22-L21	Hall’s theorem on distinct representation or Assignment of Marriage theorem
23-L22	Latin square-Definitions and examples- **Allotting portion for Internal Test-I**
	Internal Test I begins(20.07.2015)
24-L23	Problems on Latin squares
25-L24	Latin rectangle-Definitions and examples
26-IT-1	**Internal Test-I**
27-L25	Hungarian Algorithm for solving assignment

28-L26	Assignment problems
29-L27	Balanced Assignment problems
30-L28	Unbalanced Assignment problems **-Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Unbalanced Assignment problems
32- L30	Travelling salesman problem
33- L31	Travelling salesman problems
34-P2	**College level meeting/Cell function**
35- L32	Unit-3 Recurrence relation- Definition and examples
36- L33	Solving the recurrence relation
37- L34	Problems on recurrence relation
38- L35	Problems on recurrence relation
39- L36	Problems on recurrence relation
40- L37	Derivation of Fibonacci relation
41- L38	The problems of derangements-Definitions and problems
42- L39	Another formulation for derangement
43- L40	Partition of an integer, tree-Definitions and examples
44- L41	Degree of vertex, simple tree, rooted simple tree-definitions and examples
45- L42	Rooted simple tree's problems
46- L43	The generating function for rooted simple tree
47- L44	Problems on generating function for rooted simple tree
48- L45	Possible number of colouring problems
49- L46	Unit-4 The inclusion- exclusion principle
50- L47	Theorem for $\lvert A\cup B \cup c\rvert \, and \lvert A \cup B \cup C \cup D\rvert$
51- P3	**Department Seminar**
52- L48	Problems on inclusion –exclusion principle
53- L49	Problems on inclusion-exclusion principle
54- L50	Rook Polynomial-definition
55- L51	Rook polynomial problems
56-L52	Rook polynomial problems- **Allotting portion for Internal Test-II**
	Internal Test II begins(31.08.2015)
57-L53	Rook polynomial for 4x4 board and 8x8 board
58-L54	Non-interfering definitions and theorem
59-IT-II	**Internal Test-II**
60- L55	Another theorem of non-interfering
61- L56	Rook polynomial problems- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems on Rook polynomial
63- L58	Rook polynomial for 6x6 Latin square
64- L59	Rook polynomial for5x5 Latin square
65- L60	Problems on Rook polynomial
66- L61	Problems on Rook polynomial
67- L62	problems on Rook polynomial
68- L63	Unit-5 Block designs, Block -definition
69- L64	Matrix representation for Block designs
70- L65	Properties of the incident matrix
71- L66	Incident matrix problem

72- L67	Incident matrix problem
73- L68	Block design related theorem
74-P4	**College level meeting/ function**
75- L69	Properties of 7 point plane
76- L70	Incident matrix problem
77- L71	Fisher's theorem
78- L72	Note for incidence matrix
79- L73	Square Block design –Definition, properties and theorem - **Allotting portion for Internal Test-III**
	Internal Test III begins(05.10.2015)
80- L74	Theorem for square block design
81- L75	Finite projective plane definition and notes
82-IT-III	Internal Test-III
83- L76	Properties of finite projective plane
84- L77	Finite projective place related lemmas and theorem - **Test Paper distribution and result analysis**
85- L78	Hadamard matrix- definitions and examples
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test(05.10.2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on29.10.2015

Course Outcomes

Learning Outcomes	**COs** of the course Combinatorial Mathematics
CO1	Demonstrate effectively the addition and multiplication principles and use it for counting.
CO2	Use generating functions and the concept of partition to solve combinatorial problems.
CO3	Model recurrence relations using different techniques for real time counting problems and find solutions.
CO4	Outline special counting numbers such as Fibonacci number, Stirling numbers, catalan number and Manage number.
CO5	Design a new counting principle called inclusion and exclusion principle and use it for counting problems.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	CODING THEORY
Course Code	**GMMA5E**
Class	III year (2015-2016)
Semester	Odd
Staff Name	T Stalin Alexis
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives .

- Learners get introduced to coding and decoding concepts.
- Train the students in the field of coding theory.

Syllabus

Text: Coding Theory , the essentials-(marcalDekkar, 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 wordtransmitted.

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 theextenedGolay code-Golay code.

Unit 5: Polynomials and Words-Introduction to cyclic codes-Polynomial encoding and decoding-Finding cyclic codes-Dual Cyclic Codes

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2015
1-L1	Unit-1 Coding theory Introduction, word
2-L2	List all the words of lengths and examples
3- L3	Basic assumption about the channel
4-L4	Correcting and deleting error batter
5-L5	Problem 1,2,3,4,5,6 in correcting and detecting error batter
6-L6	Information rate
7-L7	Finding the most likely codeword transmitted and problems
8-L8	Theorem
9-L9	Some basic Algebra and examples and problems in basic algebra
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Weight and Distance (Add some distance problems)
12-L11	Maximum likelihood Decoding
13-L12	Reliability of Maximum Likelihood Decoding
14-L13	Error detecting codes
15-L14	Distance of the codes
16-L15	Unit-2 Linear codes
17-L16	Exercise problems in linear codes
18-L17	Two important subspaces- Linear scalar product (or) Dot product
19-L18	Orthogonal vector. Orthogonal to the set
20-L19	Linear Independence, example problems
21-L20	Basic examples and exercise
22-L21	Dimension –examples and exercise
23-L22	Matrices and exercises problems- **Allotting portion for Internal Test-I**
	Internal Test I begins(20.07.2015)
24-L23	Elementary Row operation Leading one and leading column
25-L24	Row Echelon form (REF), Reduced Row Echelon form (PREF)
26-IT-1	**Internal Test-I**
27-L25	Bases for c= $< s >$ and c⊥ $examplesandexercise$
28-L26	Algorithm and examples and exercise problems
29-L27	Algorithm for finding the basis
30-L28	Generating Matrices-Example and exercise problems- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Encoding and exercise
32- L30	Unit-3 parity – check Matrices
33- L31	Theorem 2.7.1
34-P2	**College level meeting/Cell function**
35- L32	Theorems on parity
36- L33	Exercise problems in parity check matrices
37- L34	Exercise problems in parity check matrices
38- L35	Equivalent codes
39- L36	Theorem any linear code c is a equivalent to a linear code C having a generator matrix in standard form

40- L37	Examples and exercise problems
41- L38	Exercise problems in equivalent codes
42- L39	Distance of a linear code
43- L40	Examples and exercise problems
44- L41	Examples and exercise problems
45- L42	Distance of a linear code exercise problems
46- L43	Cost
47- L44	Example and exercise problems
48- L45	Theorem and Exercise problems
49- L46	Exercise problems in cosaets of the linear code
50- L47	Exercise problems in cosets of a linear code
51- P3	**Department Seminar**
52- L48	Exercise problems in cosets of a linear code
53- L49	Minimal likelihood decoding for linear codes
54- L50	Exercise problems in linear codes
55- L51	Reliability of linear codes
56-L52	Syndrome of the word - **Allotting portion for Internal Test-II**
	Internal Test II begins(31.08.2015)
57-L53	Syndrome decoding array and exercise problems
58-L54	Unit-4 Perfect and related codes
59-IT-II	**Internal Test-II**
60- L55	some bounds forcodeas, hamming
61- L56	Maximum distance separable - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorem on maximum distance separable
63- L58	Theorems on maximum distance separable
64- L59	Corollary and the theorems
65- L60	Exercise problems in maximum distance separable
66- L61	Theorem Gilbert –varshamov bound
67- L62	Corollary of that theorem
68- L63	Exercise problems in maximum distance separable
69- L64	Perfect codes
70- L65	Hamming codes, extended code
71- L66	Parity check matrix for extended code
72- L67	Weight of the word in the extended code
73- L68	Distance of the extended code
74-P4	**College level meeting/ function**
75- L69	The extended Golay code
76- L70	Unit-5 cyclic linear code
77- L71	Algorithm and division algorithm
78- L72	Exercise problems in division algorithm
79- L73	Polynomial encoding and decoding**Allotting portion for Internal Test-III**
	Internal Test III begins(05.10.2015)
80- L74	Algorithm for decoding linear cyclic decoding
81- L75	Finding cyclic codes
82-IT-III	**Internal Test-III**
83- L76	Another method for linear cyclic codes

84- L77	Exercise problems in linear cyclic codes - **Test Paper distribution and result analysis.**
85- L78	Dual cyclic codes
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (16.10.2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29.10.2015

Course Outcomes

Learning Outcomes	**COs** of the course Coding theory
CO1	Acquire basic knowledge of coding.
CO2	Enable the students to understand the functions oflinear cyclic codes
CO3	Students get prepared for coding through congruence.
CO4	Acquisition of knowledge on the techniques of division algorithm in coding theory

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Calculus
Course Code	**GMMA11**
Class	I year (2015-2016)
Semester	Odd
Staff Name	J. Suresh Suseela V.Selvan
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- This is a foundational course for any student aspiring to complete B.Sc., degree in Mathematics.
- The calculus is the science of determining the effect of very small change. Different methods of calculating the derivative of a function and the interpretation of derivative at different circumstances are dealt in detail.
- The functions involving more than one variable and the rate of change with respect to one variable are attributed as partial derivative.
- The application of partial derivatives as a tool for engineers, scientists and social scientists are illustrated.

Syllabus

Major Paper- 1:Calculus (75 hrs)
Text: Calculus(Volume I and Volume II), S.Narayanan and T.K.Manicavachagom Pillay, S.Viswanathan (Printers Publishers) Pvt. Ltd.

Unit 1: Tangent and Normal-Direction of the tangent-Angle of intersection of

curves-subtangent and subnormal-Differential coefficient of the length of an arcof y=f(x)-Polar coordinates-Angle between the radius vector and the tangent-Polar subtangent and polar subnormal-Length of arc in polar coordinates.
(Volume I-Chapter IX-Full-Sections 1.1 to 4.6)

Unit 2: Method of finding the envelope-Curvature-Circle, radius and centre of curvature-Cartesian formulae-Evolute and Involute-Radius of curvature when the curve is given in polar coordinates.
(Volume I-Chapter X- Sections 1.1 to 2.6)

Unit 3: p-r equation-chord of curvature-linear asymptotes.
(Volume I-Chapter X-Sections 2.7 to 3.1 and Chapter XI-Full-Sections 1 to 7)

Unit 4: Multiple integrals-Evaluation of double integrals-Double integral in polar coordinates-Triple integrals.
(Volume II-Chapter 5: Sections 1 to 4)

Unit 5: Infinite integrals-Beta and Gamma functions-Properties of Beta functions-Relation between Beta and Gamma functions-Evaluation of integrals using Gamma functions.
(Volume II-Chapter 7 - Sections 1 to 5)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2015
1-L1	Unit-1 Introduction for Tangent and Normal and Discuss about the direction of the tangent
2-L2	Equations of the tangent and normal at any point of a curve
3- L3	Discuss the problem in direction of tangent
4-L4	Example problems 5,6,7,8 in equation of the tangent and normal at any point of a curve
5-L5	Discussing Exercise problems
6-L6	Properties of the tangents and normal to the curves
7-L7	Exampled problems in properties of the tangent and normal to the curve
8-L8	Exercise problems in properties of the tangent and normal to the curve
9-L9	Discuss about angle of intersection of curves and problems
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Sub tangent and Normal
12-L11	Example problems in sub tangent and normal
13-L12	Differential coefficient of the length of an arc of y=f(x)
14-L13	Polar co-ordinates, angle between the radius vector and the tangent
15-L14	To find the slope of the tangent in polar co-ordinates
16-L15	To find the angle of intersection of two curves ϕ and whose equations are given in polar co-ordinates
17-L16	Polar sub tangent and polar subnormal, The length of arc in polar co-ordinates
18-L17	Unit-2 Introduction about envelopes
19-L18	Method of finding the envelope and discuss another definition of the envelope of a family of curves

20-L19	Definition of curvature and discuss about circle and centre of curvature
21-L20	Cartesian Formula for the radius of curvature
22-L21	Example problems in Cartesian formula for the radius of curvature
23-L22	Discussing exercise problems- **Allotting portion for Internal Test-I**
	Internal Test I begins (20.07.2015)
24-L23	The co-ordinates of the centre of curvature
25-L24	Problems in the co-ordinates of centre of curvature
26-IT-1	**Internal Test-I**
27-L25	Exercise problems in the co-ordinates of centre of curvature
28-L26	Exercise problems in co-ordinates of centre of curvature
29-L27	Problems in centre of curvature
30-L28	Evolutes and Involutes definitions - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Radius of curvature of cardioids
32- L30	Problems of radius of curvature
33- L31	Problems of radius of curvature
34-P2	**College level meeting/Cell function**
35- L32	Unit-3 p-r equation; pedal equation of a curve
36- L33	Discussing problems in p-r equation
37- L34	Definition of chord of curvature
38- L35	Chords of curvature parallel to the co-ordinate axes.
39- L36	Chord of curvature passing through the pole
40- L37	Discussing problems in chord of curvature
41- L38	Linear asymptotes
42- L39	To find the equation of the asymptotes of a plane algebraic curve
43- L40	Asymptotes parallel to the axis
44- L41	Problems in asymptotes parallel to the axis
45- L42	Another method for finding asymptotes
46- L43	Problems to find rectilinear asymptotes
47- L44	Asymptotes by inspection: definition and examples
48- L45	Intersection of a curve with its asymptotes
49- L46	Problems in intersection of a curve with its asymptotes
50- L47	Problems in intersection of a curve with its asymptotes
51- P3	**Department Seminar**
52- L48	Unit-4 Introduction about multiple integrals
53- L49	Definition of the double integral
54- L50	Evaluation of double integral
55- L51	Corollary and notes of double integral
56-L52	Examples in Double Integral- **Allotting portion for Internal Test-II**
	Internal Test II begins (31.08.2015)
57-L53	Double integrals in polar co-ordinates
58-L54	Repeated integrals in polar co-ordinates and examples
59-IT-II	**Internal Test-II**
60- L55	Triple integrals-Definitions and notes
61- L56	Examples in triples integral - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Examples in triple integral

63- L58	Application of Multiple integrals and examples
64- L59	Co-ordinates of centre of gravity
65- L60	Example problems in centre of gravity
66- L61	Example problems in centre of gravity
67- L62	Exercise problem in centre of gravity
68- L63	Exercise problem in centre of gravity
69- L64	Unit-5 Introduction about Improper integrals: Beta and Gamma function
70- L65	Infinite Integral –Definition and examples
71- L66	Example problems in Integrals to $+\infty$
72- L67	Example problems in integral to $-\infty$
73- L68	Example problems in Integral from $-\infty$ to $+\infty$
74-P4	**College level meeting/ function**
75- L69	Integral becoming infinite at certain points in the interval of integration
76- L70	Example in infinite integral
77- L71	Example problems is infinite integral
78- L72	Exercise problems in infinite integral
79- L73	Exercise problems in infinite integral- Allotting portion for Internal Test-III
	Internal Test III begins (05.10.2015)
80- L74	Definition of Beta and Gamma functions
81- L75	**Convergence of gamma n definitions and corollary**
82-IT-III	**Internal Test-III**
83- L76	**Recurrence formula of Gamma function**
84- L77	Properties of Beta function **-Test Paper distribution and result analysis**
85- L78	Relation between Beta and Gamma function
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 16.10.2015**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-10-2018

Course Outcomes

Learning Outcomes	**COs** of the course "<Calculus >"
CO1	illustrate the limit definition and recall the formulae and rules of differentiation to differentiate the given functions
CO2	Make use of partial fraction and Leibnitz formula to find nth derivative of algebraic and trigonometric functions in addition to formation of equations involving derivatives.
CO3	Apply the concepts of differentiation to discuss the maxima and minima of the functions and find the equations of the tangent and normal.
CO4	Define and determine envelope, curvatures, involute and evoluteof

	the curve.
CO5	Identify and apply partial differentiation to determine the maxima and minima of functions of two variables and approximate error.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

<table>
<tr><td>Programme Name</td><td>B. Sc. Mathematics</td></tr>
<tr><td>Course Name</td><td>Algebra</td></tr>
<tr><td>Course Code</td><td>GMMA12</td></tr>
<tr><td>Class</td><td>I year (2015-2016)</td></tr>
<tr><td>Semester</td><td>Odd</td></tr>
<tr><td>Staff Name</td><td>G.S.GRACE PREMA</td></tr>
<tr><td>Credits</td><td>5</td></tr>
<tr><td>L. Hours /P. Hours</td><td>5 / WK</td></tr>
<tr><td colspan="2">Total 75 Hrs/Semester
Internal Test-3 Hrs
Model Test-3 Hrs
Dept. Meetings-2 Hrs
College Meetings-2 Hrs
Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)</td></tr>
</table>

Course Objectives

- In many ways, this course is the true gateway into the mathematics major, requiring rigorous proofs, introducing important topological concepts and laying the groundwork for Algebra and Topology.

Syllabus

Major Paper- 2:Algebra (75 hrs)

Text: Algebra(Volume I),T.K.Manicavachagom Pillay & others, S.Viswanathan (Printers Publishers) Pvt. Ltd.

Unit 1: Theory of equations-Remainder theorem-relation between roots and coefficients of equations-symmetric function of the roots.
(Chapter 6: Sections 1to 12)

Unit 2: Sum of the the powers of the roots of an equation-Newton’s theoremTransformation of equations.
(Chapter 6: Sections 13 to 15)

Unit 3: Reciprocal equations- To increase or decrease the roots of a given equation by a given quantity-removal of terms-to form an equation whose roots are any power of the roots of a given equation.
(Chapter 6: Sections 16 to 20)

Unit 4: Descarte's rule of signs-Rolle's theorem-Multiple roots-Strum's theorem.
(Chapter 6: Sections 24 to 27)

Unit 5: Solutions of Numerical Equations-Newton's method of divisorsHorner's method-Cardon's method of solving cubic equations.
(Chapter 6: Sections 28, 29, 30 and 34)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2015
1-L1	Introduction
2-L2	Theory of Equations
3- L3	Theory of Equations
4-L4	Theory of Equations
5-L5	Formation of equations
6-L6	Formation of equations
7-L7	Formation of equations
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Relation between roots and Coefficients
10- L9	Relation between roots and Coefficients
11-L10	Relation between roots and Coefficients
12-L11	Relation between roots and Coefficients
13-L12	symmetric function of the roots
14-L13	symmetric function of the roots
15-L14	symmetric function of the roots
16-L15	symmetric function of the roots
17- L16	Sum of the powers of the roots of an equation
18- L17	Sum of the powers of the roots of an equation
19- L18	Sum of the powers of the roots of an equation
20- L19	Newton's theorem
21- L20	Problem Discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins(20.07.2015)
22- L21	Newton's theorem
23- IT-1	**Internal Test-I**
24- L22	ReciprocalEquations
25- L23	ReciprocalEquations
26- L24	ReciprocalEquations**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	ReciprocalEquations
28- L26	Transformation of equations
29- L27	Transformation of equations
30- P2	**College level meeting/Cell function**
31-L28	Descarte's rule of signs
32-L29	Descarte's rule of signs
33-L30	Descarte's rule of signs

34- L31	Rolle's theorem
35- L32	Rolle's theorem
36- L33	Rolle's theorem
37- L34	Multiple roots
38- L35	Multiple roots
39- L36	Multiple roots
40- L37	Sturm's Theorem
41- L38	Multiple roots
42-P3	**Department Seminar**
43- L39	solving appropriate solution of equations usingNewton's and Horner's method.
44- L40	solving appropriate solution of equations usingNewton's and Horner's method.
45- L41	solving appropriate solution of equations usingNewton's and Horner's method.
46- L42	solving appropriate solution of equations usingNewton's and Horner's method.
47- L43	Problem Discussion - **Allotting portion for Internal Test-II**
	Internal Test II begins (31.08.2015)
48- L44	solving appropriate solution of equations usingNewton's and Horner's method.
49-IT-II	**Internal Test-II**
50-L45	Problems
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Problems
53- L48	Problems
54- L49	Biquadratic equations
55- L50	Biquadratic equations
56- L51	Biquadratic equations
57- L52	Biquadratic equations
58- L53	cubic equations solutionsby Cardon's method
59-P4	**College level meeting/ function**
60- L54	cubic equations solutionsby Cardon's method
61- L55	cubic equations solutionsby Cardon's method
62- L56	cubic equations solutionsby Cardon's method
63- L57	Problems
64- L58	Problem Discussion - **Allotting portion for Internal Test-III**
	Internal Test III begins (05.10.2015)
65- L59	Problems
66- L60	Revision
67-IT-III	**Internal Test-III**
68- L61	Problem Discussion
69- L62	Problem Discussion
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test 16.10.2015**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29.10.2015

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra"
CO1	Recall elementary properties of real numbers which lead to the Archimedean property, countability and uncountability.
CO2	Demonstrate with example, sequences which are convergent, divergent and oscillating. Enumerate properties of converging sequences and also identifies the algebraic operations on sequences
CO3	Outline the concept of Cauchy sequence. Demonstrate the existence of limit superior and limit inferior for any sequences. Existence of limit points in any bounded infinite sets is demonstrated.
CO4	Define rings and subrings and illustrate with examples.
CO5	Learners will acquire knowledge on Counting Principle and Homomorphisms.
CO6	Knowledge gained about Automorphisms and Cayley's theorem.
CO7	Learners will gain knowledge about Permutation groups, Sylow's theorems and Direct products.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Sequences, Series and Trignometry
Course Code	**GMMA21**
Class	II year(2015-2016)
Semester	Odd
Staff Name	S Vijila Velvet Daisy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Gaining knowledge on series.
- Gaining knowledge on Trignomentry.

Syllabus

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.ManicavachagomPillay,

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+ method-Gregory‘s series.
(Text-2 Chapter IV(full), Chapter V-Section 5, Chapter VI-Section 3)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2015
1-L1	UNIT-I Sequences and its examples
2-L2	Bounded Sequences
3- L3	Monotonic Sequences
4-L4	Convergent Sequences and theorem
5-L5	Examples and theorem on convergent Sequences
6-L6	Divergent and oscillating Sequences
7-L7	Theorems and examples on Divergent
8-L8	The algebra of limits
9-L9	Theorem and corollary on Monotonic
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Theorem 15,16,17
12-L11	Theorem 18,19
13-L12	Theorem 20,21
14-L13	Results on Algebra of limits
15-L14	Theorem and example
16-L15	Problems on algebra of limits
17-L16	Problems on algebra of limits
18-L17	UNIT-II Behaviour of Monotonic sequence
19-L18	Problems on Monotonic sequence
20-L19	Problems on Monotonic sequence
21-L20	Cauchy’s 1^{st}limit theorem
22-L21	Cauchy’s theorem
23-L22	Cauchy’s 2^{nd}limit theorem - **Allotting portion for Internal Test-I**
	Internal Test I begins(20.07.2015)
24-L23	Problems on limit theorem
25-L24	Problems on limit theorem
26-IT-1	**Internal Test-I**
27-L25	Subsequence’s
28-L26	Peak point definition and theorem
29-L27	Limit point
30-L28	Cauchy’s Sequences - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Cauchy’s general principle of convergence
32- L30	Examples on limit point
33- L31	Theorem on limit point
34-P2	**College level meeting/Cell function**
35- L32	UNIT-III Series of positive terms definition and theorem
36- L33	Examples and Note on series
37- L34	Cauchy’s general principle of convergence

38- L35	Comparison test
39- L36	Theorem on Comparison test
40- L37	Problems on Comparison test
41- L38	Problems on Comparison test
42- L39	Kummer's test
43- L40	D'Alembert's ratio test
44- L41	Raabe's test
45- L42	Demorgan and Bertand's test
46- L43	Gauss test
47- L44	Problems on Gauss test
48- L45	Problems on Raabe's test
49- L46	Cauchy's root test
50- L47	Cauchy's condensation test
51- P3	**Department Seminar**
52- L48	UNIT-IV Alternating series
53- L49	Leibnitz test
54- L50	Problems on Leibnitz test
55- L51	Problems on Leibnitz test
56-L52	Absolute convergence - **Allotting portion for Internal Test-II**
	Internal Test II begins(31.08.2015)
57-L53	Conditionally convergence
58-L54	Theorem and Problems on Absolute convergence
59-IT-II	**Internal Test-II**
60- L55	Problems on conditionally convergence
61- L56	Multiplication of series -**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Examples and Note
63- L58	Abel's Theorem
64- L59	Theorem on Absolute convergence
65- L60	Problems on Absolute convergence
66- L61	Marten's Theorem
67- L62	Theorems on Absolute convergence
68- L63	Problems on Mertens
69- L64	UNIT-V Hyperbolic function
70- L65	Results on Hyperbolic function
71- L66	Hyperbolic function definition and notes
72- L67	Relation between Hyperbolic function
73- L68	Problems on Hyperbolic function
74-P4	**College level meeting/ function**
75- L69	Hyperbolic function corresponding to relation between circular function
76- L70	Problems on Hyperbolic function
77- L71	Inverse hyperbolic function
78- L72	Problems on Inverse hyperbolic function
79- L73	Problems on Inverse hyperbolic function - **Allotting portion for Internal Test-III**
	Internal Test III begins(05.10.2015)
80- L74	Logarithms and complex quantities
81- L75	General value of logarithm of (x+iy)

82-IT-III	**Internal Test-III**
83- L76	Problems on Logarithms
84- L77	Summation of series - **Test Paper distribution and result analysis**
85- L78	Summation of series
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test16.10.2015**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29.10.2015

Course Outcomes

Learning Outcomes	**COs** of the course "Sequences, Series and Trigonometry"
CO1	acquire the knowledge of various inequalities and their applications
CO2	have in-depth knowledge of various types of sequences
CO3	learn sub-sequences and also finding the limits of sequences
CO4	deepen the knowledge of infinite series and various tests for finding the behaviour of series
CO5	apply these concepts in other fields of mathematics

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	LINEAR ALGEBRA
Course Code	**GMMA51**
Class	III year (2015-2016)
Semester	Odd
Staff Name	J VIJAYA XAVIER PARITHIPAN
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Linear algebra is a branch of mathematics that studies systems of linear equations and the properties of matrices.
- The concepts of linear algebra are extremely useful in physics, economics and social sciences, natural sciences, and engineering.
- To understand the axiomatic structure of a modern mathematical subject and learn to construct simple proofs.
- To solve problems those apply Linear Algebra to Chemistry, Economics and Engineering.

Syllabus

Major Paper 7: Linear Algebra (90Hrs)
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))

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on18.06.2015
1-L1	Unit-I Introduction
2-L2	Definitions and Examples
3- L3	Scalars, vectors, scalars multiple
4-L4	Notes and Remarks
5-L5	Theorems on vectorspace
6-L6	Subspaces
7-L7	Theorems on supspaces
8-L8	Solved problems and examples
9-L9	Theorems using operations
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Linear transformation
12-L11	Definitions about Homomorphism, Epimorphism and Kernel
13-L12	Fundamental theorem of homomorphism
14-L13	Theorems on vector spaces
15-L14	Span of a set
16-L15	Linear combination, linear span
17-L16	Theorems and examples
18-L17	Unit-II Linear independence
19-L18	Finite dimensional
20-L19	Finite dimensional and its theorems
21-L20	Examples on finite dimensional
22-L21	Linearly independence and dependent
23-L22	Exercises problem - **Allotting portion for Internal Test-I**
	Internal Test I begins(20.07.2015)
24-L23	Note and examples
25-L24	Theorems – any subset of a linearly independent set is linearly independent
26-IT-1	**Internal Test-I**
27-L25	Theorems and examples
28-L26	Basis
29-L27	Theorems on basis
30-L28	Exercise problem - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Theorems and examples
32- L30	Any two bases of finite dimensional vector space V have the same numbers of elements
33- L31	Dimensional
34-P2	**College level meeting/Cell function**
35- L32	Maximal linear independent set
36- L33	Unit-III Rank and nullity

37- L34	Theorems and examples
38- L35	Singular and non-singular
39- L36	Exercise problems on rank
40- L37	Some solved problems on
41- L38	Matrix of a linear transformation
42- L39	Note on matrix
43- L40	Solved problems on Rank of matrix
44- L41	Definition and theorems
45- L42	Exercise problems on matrix
46- L43	Rank of matrix
47- L44	Solved problems
48- L45	Characteristic matrix
49- L46	Theorems and examples on Rank of matrix
50- L47	Theorems and corollary on Rank of matrix
51- P3	**Department Seminar**
52- L48	Solved problems on Characteristic matrix
53- L49	Unit-IV Characteristis equation and cayley Hamilton theorem
54- L50	Matrix polynomial
55- L51	Definitions and examples
56-L52	Cayley Hamilton theorem - **Allotting portion for Internal Test-II**
	Internal Test II(31.08.2015)
57-L53	Note and solved problems on Cayley Hamilton theorem
58-L54	Problems using Cayley Hamilton theorem
59-IT-II	**Internal Test-II**
60- L55	Exercise problem on Cayley Hamilton theorem
61- L56	Eigenvalues ,Eigen vectors - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Characteristic roots and properties of Eigen values
63- L58	Results on Eigen values
64- L59	Corollary of Eigen values
65- L60	Solved problems on Eigen values
66- L61	Solved problems on Eigen values
67- L62	Problems to find Eigenvalues
68- L63	Problems to find Eigenvalues
69- L64	Solved problems on Eigenvalue
70- L65	Unit-V Inner product spaces
71- L66	Eucildean space
72- L67	Some notes on Eucildean space
73- L68	Theorems and examples on Eucildean space
74-P4	**College level meeting/ function**
75- L69	Norm, unit vector-definition
76- L70	Solved problems on Norm
77- L71	Theorems using norm
78- L72	Orthogonal
79- L73	Some notes and definitions - **Allotting portion for Internal Test-III**
	Internal Test III begins(05.10.2015)
80- L74	Theorems using orthogonal set
81- L75	Gram –Schmidt Orthogonalisation

82-IT-III	**Internal Test-III**
83- L76	Solved problems on orthogonal set
84- L77	Orthogonal complement - **Test Paper distribution and result analysis**
85- L78	Corollary and solved problems on Orthogonal complement
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (16.10.2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29.10.2015

Course Outcomes

Learning Outcomes	**COs** of the course linear Algebra
CO1	Enable the students to learn about the convergence and divergence of the series.
CO2	find the roots for the different types of the equations
CO3	On successful completion of this course the students should have gained knowledge about the convergence of series and solving equations.
CO4	know the fundamentals of vector space
CO5	Understand basis and dimension of a vector space.
CO6	DetermineEigen values and Eigen vectors.
CO7	Get interest in pure mathematics.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B Sc Mathematics
Course Name	Real Analysis
Course Code	**GMMA52**
Class	IIIyear (2015-2016)
Semester	Odd
Staff Name	W. RajammalRanjitha Mary
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Semester Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The course deals with metric spaces which is a classical extension of the real line and its properties in terms of the distance.
- The course introduces to the students, metric spaces and its properties.
- The properties like connectedness, completeness and compactness which are inherent in nature in the real line are extended to the metric spaces.
- Also properties like continuity and uniform continuity are exploited.

Syllabus

Major Paper 8: Real Analysis (90 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-UniformContinuity-Discontinuous functionson **R**.(Chapter 4(full))

Unit 4: Connectedness-Connected subsets of **R-**Connectedness and Continuity-Contraction Mapping Theorem.

(Chapter 5 (full) and Chapter 8 upto theorem 8.2)

Unit 5: Compactness-Compct metric spaces-Compact subsets of **R-**Heine Borel Theorem-Equivalent Characterizations for compactness-Compactness and Continuity.

(Chapter 6(full))

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2015
1-L1	Unit-I Introduction on Countable sets
2-L2	Theorems and Problems in countable sets
3- L3	Uncountable sets
4-L4	Metric spaces: Definition and examples
5-L5	Examples on a metric spaces
6-L6	Solved problems on a metric spaces
7-L7	Bounded sets in a metric spaces
8-L8	Definition of diameter and its examples
9-L9	Open ball in a metric space
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Examples in open ball
12-L11	Open sets: Definition and examples
13-L12	Theorem on open sets
14-L13	Solved problems on open sets
15-L14	Equivalentmetrices
16-L15	Subspaces: Definition and examples
17-L16	Solved problems on subspaces
18-L17	Unit-II Interior of a set: Definition and examples
19-L18	Interior of a set: Theorems
20-L19	Closed set: Definition and examples
21-L20	Closed ball: Definition, examples and theorem
22-L21	Closure: Definition and examples
23-L22	Exercise problems- **Allotting Portion for Internal Test I**
	Internal Test I begins (20.07.2015)
24-L23	Closure: Definition and theorem
25-L24	Limit point: Definition and examples
26-IT-1	**Internal Test-I**
27-L25	Limit point: Theorems
28-L26	Corollary of limit point

29-L27	Solved problems on limit point
30-L28	Exercise problems on limit point :**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Dense set: Definition and examples
32- L30	Dense set: Theorems and solved problems
33- L31	Completeness: Definition and note
34-P2	**College level meeting/Cell function**
35- L32	Completeness: Theorems and examples
36- L33	Theorems and solved problems Completeness
37- L34	Cantor’s intersection theorem
38- L35	Unit III- Baire’s category theorem- Definition and examples
39- L36	Baire’s category theorem and Solved problems
40- L37	Continuity- Definition, ,note, theorem and examples
41- L38	Theorems and solved problems
42- L39	Solved problems on Continuity
43- L40	Homeomorphism: Definition and examples
44- L41	Examples Continuity
45- L42	Isometric definition and examples
46- L43	Uniform continuity- Introduction , definition and note
47- L44	Solved problems on Continuity
48- L45	Discontinuous function on R
49- L46	Discontinuity function- Definition and examples
50- L47	Theorems on Discontinuity function
51- P3	**Department Seminar**
52- L48	Oscillation: Definition and examples
53- L49	Examples and theorem
54- L50	Theorem on Oscillation
55- L51	Unit IV: Connectedness: Introduction, definition and examples
56-L52	Solved problems on Connectedness - **Allotting portion for Internal Test-II**
	Internal Test II begins(31.08.2015)
57-L53	Connectedness and continuity- theorem
58-L54	Solved problems on Connectedness
59-IT-II	**Internal Test-II**
60- L55	Connected subsets of R- theorem
61- L56	Solved problems on Connectedness - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Contraction mapping theorem- Introduction
63- L58	Definition and examples Contraction mapping
64- L59	Contraction mapping theorem
65- L60	Theorem on Contraction mapping
66- L61	Unit V: Compactness- Introduction and Compact metric space-Definition and examples
67- L62	Theorems on Compactness
68- L63	Note and theorems on Compactness
69- L64	Theorems on Compactness
70- L65	Compact subset of R
71- L66	Heine Borel theorem

72- L67	Theorem on Compactness
73- L68	Equivalent characterisation for compactness- definition and examples
74-P4	**College level meeting/ function**
75- L69	Theorems on Compactness
76- L70	Totally bounded definition and examples
77- L71	Subsequence- definition and examples
78- L72	Corollary
79- L73	Sequentially compact- theorems - **Allotting portion for Internal Test-III**
	Internal Test III begins(05.10.2015)
80- L74	Theorems on Sequentially compact
81- L75	Solved problems on Sequentially compact
82-IT-III	**Internal Test-III**
83- L76	Compactness and continuity
84- L77	Note and theorems on Compactness and continuity - **Test Paper distribution and result analysis**
85- L78	Solved problems on Compactness and continuity
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (16.10.2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29.10.2015

Course Outcomes

Learning Outcomes	**COs** of the course Real analysis
CO1	Recall elementary properties of real numbers which lead to the Archimedean property, countability and uncountability.
CO2	Predict correct choice of test and apply for test of convergence of series.
CO3	Demonstrate connectedness and correlate the relation between the space and its image under a continuous map with reference to connectedness.
CO4	Describe completeness and its relation with totally boundedness.
CO5	Describe compactness of a metric space and compile all equivalent definitions.
CO6	compare real line and metric space concepts
CO7	get a good foundation for the future studies in Analysis

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Application of Differential Equation
Course Code	GSMA3A
Class	II year (2015-2016)
Semester	Odd
Staff Name	J. Suresh Suseela
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- Mathematics will allow the students to develop a sophisticated understanding of mathematical structures and principles while gaining a wide range of skills that are attractive to employers.
- To reinforce and enhance the mathematical tools introduced earlier.
- Differential equation as a mathematical model for solving problems in chemistry is the central theme of the course.
- This course deals with differentiation, integration, differential equations and Laplace transform.

Syllabus

Application of Differential Equations

Text: Differential Equations and its Applications by -S.Narayanan and

T.K.ManicavachagomPillay,

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)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2015
1-L1	Unit I- Introduction on first order equation
2-L2	Introduction on Applications of first order equation
3- L3	Introduction on Growth, decay and chemical reaction
4-L4	Basic definition and some examples
5-L5	Derivation of Growth, decay and chemical reaction
6-L6	Example problems in Growth
7-L7	Example problems in Decay
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Example problems based on chemical reaction
10- L9	Exercise problems in Growth and decay
11-L10	Exercise problems in chemical reaction
12-L11	Unit II- Introduction on flow of water
13-L12	Introduction on flow of water from an orifice
14-L13	Derivation on flow of water from an orifice
15-L14	Example problems on flow of water from an orifice - **Allotting portion for Internal Test-I**
	Internal Test I begins (20.07.2015)
16-L15	Exercise problems in flow of water
17-IT-1	**Internal Test-I**
18-L16	Introduction on falling bodies and other rate problems
19-L17	Derivation on freefall under gravity- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Problems based on freefall under gravity
21- L19	Derivation on retarded fall
22- P2	**College level meeting/Cell function**
23-L20	Problems based on retarded fall

24-L21	Exercise and example problems in flow of water
25-L22	Unit III Introduction on Brachistrochrome
26-L23	Brachistrochrome problems
27-L24	Derivation of Brachistrochrome
28-L25	Derivation of Brachistrochrome (conclusion)
29-L26	Solving Brachistrochrome problems
30-L27	Introduction on simple electric circuits
31-L28	Diagram and basic elements of simple electric circuits
32-L29	The properties and relation of the elements of simple electric circuits
33-L30	Derivation on simple electric circuits
34- P3	**Department Seminar**
35-L31	Example and exercise problems in simple electric circuits
36-L32	Unit IV- Introduction on variable mass- **Allotting portion for Internal Test-II**
	Internal Test II begins(31.08.2015)
37- L33	Introduction on dynamical problems in variable mass
38- IT-II	**Internal Test-II**
39-L34	Derivation of dynamical problems in variable mass
40-L35	Example and exercise problems in Dynamical problems- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Introduction on Application to vibrations in mechanical systems
42- L37	Derivation on damped simple harmonic vibration
43- L38	Derivation on damped vibration
44- P4	**College level meeting/ function**
45-L39	Derivation on damped vibration
46-L40	Derivation on forced vibration
47-L41	Example and exercise problems in vibration
48-L42	**Unit V** Introduction on Newton's law
49-L43	Newton's law of gravitation
50-L44	Motion of particles derivation - **Allotting portion for Internal Test-III**
	Internal Test III begins(05.10.2015)
51 L45	Introduction on central force
52- L46	Central gravitational force
53-IT-III	**Internal Test-III**
54-L47	Kepler's I and III law
55-L48	Newton's deduction from Kepler's law- **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test16.10.2015**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29.10.2015

Course Outcomes

Learning Outcomes	**COs** of the course Application of Differential Equation
CO1	apply the concept of differentiation of functions
CO2	identify and apply partial differentiation to determine the maxima and minima of functions of two variables
CO3	evaluate definite and indefinite integrals
CO4	formulate and solve the first and second order differential equations
CO5	use Laplace transform techniques to solve differential equations

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Graph Theory
Course Code	**JMMA64**
Class	III year (2016-2017)
Semester	Even
Staff Name	Dr. Mrs. G. S. Grace Prema
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the notion of graph theory and its applications
- To learn the techniques of combinatorics in graph theory

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester VI/Core – 12

GRAPH THEORY

Unit I Finite and infinite graphs – degree – Isolated vertex, pendent vertex and null graph – walks, paths and cycles (Definite and examples only) subgraphs – connected and disconnected graph, Eulerian and Hamiltonian

Unit II Trees and fundamental circuits – properties of Trees - distance and centre, binary tree, spanning tree, cut set and cut vertices - properties – connectivity.

Unit III Planar and dual graphs - different representation of planar graphs – Detection of planarity.

Unit IV Graph operations (unions, composition, product) matrix representation – incident, adjacency matrix – rank – cell set matrix – Relations, path matrix

Unit V Chromatic number – chromatic partitioning. Chromatic polynomial – domination – Covering (definition and examples only) - colouring – five colour Theorem - Four Colour problem.

Text Book:

1) Arumugam .S and S. Ramachandran - Invitation to Graph Theory - Scitech Publications India Pvt. Limited Chennai (2004 edition)

Books for Reference :

1. Narasing Deo – Graph Theory with applications to Engineering and Computer Science - Hall of India Pvt. Ltd.
2. Kumaravelu .S – Graph Theory – Edition 1
3. Gowthem - Graph Theory
4. Roberts .F.S - Graph Theory and its Applications to problems of Society - SIAM. Odyssey Press, New Hamphire 1978.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03.12.2018
1-L1	Introduction
2-L2	Finite and infinite graphs Definitions
3- L3	Finite and infinite graphs Examples
4-L4	Degree Definitions and Example
5-L5	Isolated vertex, pendent vertex and null graph Definitions and Example
6-L6	walks, paths and cycles Definitions and Example
7-L7	Subgraphs
8-L8	Subgraphs
9-L9	Subgraphs
10-P1	**Inauguration of Mathematics Association**
11-L10	Problems
12-L11	connected and disconnected graph
13-L12	connected and disconnected graph
14-L13	connected and disconnected graph
15-L14	connected and disconnected graph
16-L15	Eulerian and Hamiltonian
17-L16	Eulerian and Hamiltonian
18-L17	Trees and fundamental circuits
19-L18	Trees and fundamental circuits
20-L19	Trees and fundamental circuits
21-L20	properties of Trees
22-L21	properties of Trees
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(18.01.2019)
24-L23	properties of Trees
25-L24	Distance and centre, binary tree, spanning tree, cut set and cut vertices definitions and example
26-IT-1	**Internal Test-I**
27-L25	Distance and centre, binary tree, spanning tree, cut set and cut vertices
28-L26	Distance and centre, binary tree, spanning tree, cut set and cut vertices

29-L27	Distance and centre, binary tree, spanning tree, cut set and cut vertices
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Properties
32- L30	Properties
33- L31	connectivity
34-P2	**College level meeting/Cell function**
35- L32	connectivity
36- L33	connectivity
37- L34	Planar and dual graphs
38- L35	Planar and dual graphs
39- L36	Planar and dual graphs
40- L37	Planar and dual graphs
41- L38	different representation of planar graphs
42- L39	different representation of planar graphs
43- L40	different representation of planar graphs
44- L41	different representation of planar graphs
45- L42	different representation of planar graphs
46- L43	Detection of planarity
47- L44	Detection of planarity
48- L45	Detection of planarity
49- L46	Detection of planarity
50- L47	Graph operations (unions, composition, product) matrix representation
51- P3	**Department Seminar**
52- L48	Graph operations (unions, composition, product) matrix representation
53- L49	Graph operations (unions, composition, product) matrix representation
54- L50	Graph operations (unions, composition, product) matrix representation
55- L51	Graph operations (unions, composition, product) matrix representation
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(25.02.2019)
57-L53	Exercise Problem Discussion
58-L54	incident, adjacency matrix
59-IT-II	**Internal Test-II**
60- L55	incident, adjacency matrix
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Rank matrix
63- L58	Rank matrix
64- L59	cell set matrix
65- L60	cell set matrix
66- L61	cell set matrix
67- L62	Relations, path matrix
68- L63	Relations, path matrix
69- L64	Relations, path matrix
70- L65	Chromatic number Definitions and Example
71- L66	chromatic partitioning Definitions and Example
72- L67	Chromatic polynomial Definitions and Example
73- L68	domination Definitions and Example

74-P4	**College level meeting/ function**
75- L69	Covering Definitions and Example
76- L70	colouring
77- L71	colouring
78- L72	five colour Theorem
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(22.03.2019)
80- L74	five colour Theorem
81- L75	Four Colour problem
82-IT-III	**Internal Test-III**
83- L76	Four Colour problem
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (08.04.2019)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Graph Theory"
CO1	Learners will know about the notion of graph theory and its applications.
CO2	Acquisition of knowledge on the techniques of combinatorics in graph theory

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Number Theory
Course Code	**GMMA6A**
Class	III year (2016-2017)
Semester	Even
Staff Name	W. RajammalRanjitha Mary
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The study of number theory inevitably includes knowledge of the problems and techniques of elementary number theory; however the tools which have evolved to address such problems and their generalizations are both analytic and algebraic, and often intertwined in surprising ways. This course covers topics from classical number theory including discussions of mathematical induction, prime numbers, division algorithms, congruence's, and quadratic reciprocity.

Syllabus

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 Chience Reminder Theorem.

(Chapter 4: Sections 4.2 to 4.4)

Unit 5: Fermat‘s Theorem-Wilson‘s Theorem.

(Chapter 5: Sections 5.2, 5.3)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 01-12-2016
1-L1	Unit – I Introduction
2-L2	Mathematical Induction
3- L3	Well Ordering Principle
4-L4	First principle of finite induction
5-L5	First principle problems
6-L6	First principle problems
7-L7	Bernoulli’s inequality
8-L8	Second principle of induction
9-L9	Lucas sequence
10-P1	**Inauguration of Mathematics Association**
11-L10	Second principle problems
12-L11	Pascal rule
13-L12	Newton’s identity
14-L13	Binomial theorem
15-L14	Cantalan number and Problems
16-L15	Pentagonal number
17-L16	Early Number Theory
18-L17	Unit – II Division Algorithm
19-L18	Division Algorithm related Corollary , Example
20-L19	Division Algorithm related problems
21-L20	Greatest Common Divisor – Definitions , Example , Note
22-L21	Greatest Common Divisor related Theorems , Corollary
23-L22	Relatively prime , Euclidean lemma - **Allotting portion for Internal Test-I**
	Internal Test I begins(24-01-2017)
24-L23	Mathematical Induction’s Problems
25-L24	Euclidean Algorithm and GCD problems
26-IT-1	**Internal Test-I**
27-L25	Least Common Multiple – Definitions , Theorems
28-L26	Least Common Multiple – Problems
29-L27	Diophantine equation – Definitions , Theorems

30-L28	Diophantine equations Corollary - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Diophantine equation's Examples
32- L30	Diophantine equation's Problems
33- L31	Divisions Algorithm's more problems
34-P2	**College level meeting/Cell function**
35- L32	Divisions Algorithm's problems
36- L33	Unit – III Primes and their distributions
37- L34	Composite number's definitions and theorems
38- L35	Corollary to the above theorems
39- L36	Fundamental theorem of Arithmetic
40- L37	Pythagoras theorem
41- L38	Pythagoras theorem related problems
42- L39	Pythagoras theorem related results
43- L40	The Sieve of Eratosthenes – Explanation
44- L41	The Sieve of Eratosthenes related problems
45- L42	Euclid theorem
46- L43	Euclidean number's definition and examples
47- L44	Euclidean number's theorems and result
48- L45	Euclidean number's corollary
49- L46	Repunit – Definition and Theorem
50- L47	Other two theorems on repunit
51- P3	**Department Seminar**
52- L48	Twin prime – Examples and Problems
53- L49	Unit – IV Theory of Congruence
54- L50	Definitions and Theorems on Congruence
55- L51	Properties for congruence
56-L52	Problems for congruence - **Allotting portion for Internal Test-II**
	Internal Test II begins(24-02-2017)
57-L53	Congruence related problems
58-L54	Binary and decimal representation of integers
59-IT-II	**Internal Test-II**
60- L55	Binary representation related problems
61- L56	Solution of congruence – Definitions and Corollary - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Decimal expansion's theorems and problems
63- L58	Polyndrome – Definitions and Problems
64- L59	Linear Congruence Theorem
65- L60	Problems on Linear Congruence
66- L61	Chinese Remainder Theorem
67- L62	Theorem on System of Linear Congruence
68- L63	System of Linear Congruence's problems
69- L64	System of Linear Congruence's problems
70- L65	Unit – V Fermat Theorem
71- L66	Corollary to Fermat Theorem
72- L67	Lemma to the above Corollary
73- L68	Wilson's Theorem

74-P4	**College level meeting/ function**
75- L69	Quadratic Congruence’s Theorem
76- L70	Fermat – Kraitchik factorisation method
77- L71	Problems on Fermat’s method
78- L72	Pseudoprime – Definition and Theorems
79- L73	Absolute Pseudoprime - Definitions **- Allotting portion for Internal Test-III**
	Internal Test III begins(23-03-2017)
80- L74	Absolute Pseudoprime – Notes
81- L75	Problems on Wilson’s theorems
82-IT-III	**Internal Test-III**
83- L76	Problems on Wilson’s theorem
84- L77	Problems on Fermat theorem - **Test Paper distribution and result analysis**
85- L78	Problems using Fermat theorem
	Entering Internal Test-III Marks into University portal **Model test beings (05-04-2017)**
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course Number Theory
CO1	Recall the basic concepts of divisibility.
CO2	Demonstrate renowned theorems in solving congruences.
CO3	Discuss on quadratic congruence equations.
CO4	Analyze various arithmetical functions.
CO5	Identify the numbers of special form and apply divisibility rules in solving Diophantine equations.
CO6	Have an in-depth knowledge in division algorithm, Euclidean algorithm and its applications.
CO7	Understand the concept of well-ordering principle and Archimedean property.
CO8	Acquire the basic properties of congruence.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Abstract Algebra
Course Code	**GMMA41**
Class	II year (2016-2017)
Semester	Even
Staff Name	J. Vijaya Xavier Parthipan
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- This is a basic course for any student aspiring to complete B.Sc., degree in Mathematics. The essence of mathematical logics and its ramifications in the study of mathematics is introduced. Basic properties of sets which are needed for the study of algebra are introduced. The students are exposed to the basic algebraic structure called group. Subsequently the properties of groups and imbedding a group in a bigger group called the group of symmetries are dealt with. The algebraic equivalence of any two groups is studied by means of isomorphism

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 01-12-2016
1-L1	UNIT-I Introduction on Relation
2-L2	Relation- definition and Examples
3- L3	Equivalence Relation
4-L4	Symmetric, reflexive, transitive
5-L5	Equivalence class- definition and Examples
6-L6	Equivalence Relation Theorems.
7-L7	Solved problems from Equivalence Relations
8- P1	**Inauguration of Mathematics Association**
9- L8	Functions
10- L9	Types of Functions and Examples
11-L10	One-one, onto definition and Examples
12-L11	Restriction, composite definition and Examples
13-L12	Theorems on compositions
14-L13	Solved problems and Theorems from Bijection
15-L14	UNIT – II Permutation Groups
16-L15	Definition on symmetric group and order of G
17- L16	Cycle of length examples and note
18- L17	Theorems and examples from disjoint
19- L18	Theorems on permutation
20- L19	Theorems on even, odd permutation
21- L20	Introduction on Cyclic groups- **Allotting portion for Internal Test-I**
	Internal Test I begins (24-01-2017)
22- L21	Cyclic groups Theorems and Examples
23- IT-1	**Internal Test-I**
24- L22	Order of an element
25- L23	Theorems and corollary and Solved problems
26- L24	Cosets and Lagrange’s Theorem- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Theorems about subgroups
28- L26	Examples and Solved problems

29- L27	UNIT – III Introduction on Normal subgroups and Quotient Groups
30- P2	**College level meeting/Cell function**
31-L28	Normal subgroups Theorems
32-L29	Some Solved problems on Normal subgroups
33-L30	Definition on Quotient Groups
34- L31	Introduction on Isomorphism and Isomorphic
35- L32	Theorems and Examples on Isomorphism
36- L33	Remark and Theorems on Isomorphism
37- L34	Solved problems on Isomorphism
38-L35	Cayley's Theorem
39- L36	Definition on automorphism, inner automorphism
40- L37	Note and Solved problems on automorphism
41- L38	Introduction on Homomorphism's
42-P3	**Department Seminar**
43- L39	Theorems on Homomorphism's
44- L40	Kernal 's on Theorems
45- L41	Fundamental Theorem of Homomorphism
46- L42	UNIT – IV Definitions and examples on Ring
47- L43	Elementary properties of rings- **Allotting portion for Internal Test-II**
	Internal Test II begins (24-02-2017)
48- L44	Note and Solved problems on rings
49-IT-II	**Internal Test-II**
50-L45	Isomorphism Definition and examples
51- L46	Types of rings- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Rings with identity- Definition
53- L48	Theorem on rings with identity
54- L49	Skew field
55- L50	Theorems and Solved problems on rings
56- L51	Characteristic of a rings
57- L52	Definition on Subrings
58- L53	Solved problems on Subrings
59-P4	**College level meeting/ function**
60- L54	Subfield - Theorems
61- L55	UNIT – V Introduction on Ideals
62- L56	Principal ideal generated by a ideal
63- L57	Theorems on ideal
64- L58	Principal ideal domain examples - **Allotting portion for Internal Test-III**
	Internal Test III begins (23-03-2017)
65- L59	Introduction on Quotient rings
66- L60	Quotient rings of R modulo I
67-IT-III	**Internal Test-III**
68- L61	Solved problems on Quotient rings
69- L62	Introduction on Maximal ideal
70- L63	Theorems on Maximal ideal - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (05-04-2017)**
72-MT	**Model Test**

73-MT	**Model Test**
74-L64	Prime ideal and corollary**Model test paper distribution and previous year university question paper discussion**
75-L65	The fundamental theorem of homomorphism -**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course Abstract Algebra
CO1	get familiar with group and its related topics
CO2	get a clear idea about homomorphism, isomorphism
CO3	have basic knowledge of ring and its related topics
CO4	get confidence to face any questions related with groups and rings
CO5	appreciate pure mathematics

\

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Complex Analysis
Course Code	**GMMA61**
Class	III year (2016-2017)
Semester	Even
Staff Name	G.JEYA KUMAR
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

Complex analysis, traditionally known as the theory of functions of a complex variable, is the branch of mathematical analysis that investigates functions of complex numbers. It is useful in many branches of mathematics, including algebraic geometry, number theory, analytic combinatorics, applied mathematics; as well as in physics, including hydrodynamics and thermodynamics and also in engineering

Syllabus

Complex Analysis (90 Hrs)

Text: Complex Analysis by Dr.S.Arumugam and Others, Scitech Publications.

Unit 1: Complex numbers-nth 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- $f\,(\cos\theta,\ \sin\theta)d\theta$only.

(Chapter 7: Sections 7.2, 7.4 and Chapter 8: Sections 8.1 to 8.3)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 01-12-2016
1-L1	UNIT-I Functions of a complex variable
2-L2	Definition of limits
3- L3	Definition of Conjugation and modulus
4-L4	Solved problems on conjugation and modulus
5-L5	Definition of Inequality
6-L6	Definition of Square root
7-L7	Solved problems on square root
8-L8	Definition of Geometrical Representation of complex number
9-L9	Polar form of a complex number
10-P1	**Inauguration of Mathematics Association**
11-L10	Definition of n^{th} roots of complex numbers.
12-L11	Exercise problems on Geometrical Representation of complex number
13-L12	Definition of Straight lines and Circle
14-L13	Regions in the complex plane
15-L14	Example of Regions in the complex plane
16-L15	The Extended complex plane
17-L16	Solved problems on The Extended complex plane
18-L17	UNIT-II Definition of Analytic functions
19-L18	Exercise problems on Analytic functions
20-L19	Limits and definition
21-L20	Examples of limits
22-L21	Theorems on limit
23-L22	Exercise problems on limits - **Allotting portion for Internal Test-I**
	Internal Test I begins(24-01-2017)
24-L23	Definition of Continuous functions
25-L24	Definition of Differentiability
26-IT-1	**Internal Test-I**
27-L25	Exercise problems on Differentiability
28-L26	Theorem of Cauchy- Riemann Equations

29-L27	Examples of Cauchy- Riemann Equations
30-L28	Alternate form of Cauchy- Riemann Equations - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Definition of Analytic functions
32- L30	Solved problems on Analytic functions
33- L31	Definition of Harmonic functions
34-P2	**College level meeting/Cell function**
35- L32	Milne-Thompson method
36- L33	UNIT-III Definition of Bilinear transformations
37- L34	Definition of Elementary transformations
38- L35	Solved problems on Elementary transformations
39- L36	Definition of Bilinear or Mobius transformation
40- L37	Theorems on Bilinear transformations
41- L38	Solved problems on Bilinear transformations
42- L39	Definition of Cross ratio
43- L40	Solved problems on Cross ratio
44- L41	Exercise problems on Cross ratio
45- L42	Fixed points of Bilinear transformations
46- L43	Theorems on Bilinear transformations
47- L44	Solved problems on Bilinear transformations
48- L45	Exercise problems on Bilinear transformations
49- L46	UNIT-IV Definition of Definite integral
50- L47	Definition of integral
51- P3	**Department Seminar**
52- L48	Solved problems on Definite integral
53- L49	Cauchy's theorem
54- L50	Definition of Cauchy's theorem
55- L51	Cauchy's theorem for multiply connected region
56-L52	Cauchy's integral formula- **Allotting portion for Internal Test-II**
	Internal Test II begins(24-02-2017)
57-L53	Maximum Modulus theorem
58-L54	Solved problems on Maximum Modulus
59-IT-II	**Internal Test-II**
60- L55	Definition of Higher derivatives
61- L56	Liouville's Theorem- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Solved problems on Higher derivatives
63- L58	Definition of Taylor's series
64- L59	Examples on Taylor's series
65- L60	Solved problems on Taylor's series
66- L61	Exercise problems on Taylor's series
67- L62	UNIT – V Definition of Laurent's series
68- L63	Laurent's theorem
69- L64	Solved problems on Laurent's series
70- L65	Definition of Singularities
71- L66	Examples of Singularities
72- L67	Theorem on Singularities

73- L68	Solved problems on Singularities
74-P4	**College level meeting/ function**
75- L69	Definition of Residues
76- L70	Solved problems on Residues
77- L71	Cauchy’s Residue theorem
78- L72	Argument theorem
79- L73	Roche’s theorem- **Allotting portion for Internal Test-III**
	Internal Test III begins(23-03-2017)
80- L74	Solved problems on Residues
81- L75	Evaluation of Definite integrals
82-IT-III	**Internal Test-III**
83- L76	Solved problems on Definite integrals
84- L77	Exercise problems on Definite integrals - **Test Paper distribution and result analysis**
85- L78	Exercise problems on Definite integrals
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test(05-04-2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course Complex Analysis
CO1	Explain the geometry of complex numbers. Demonstrate bilinear transformation as composition of elementary transformations. Compile the relation between bilinear transformation and cross ratio.
CO2	Differentiate differentiability and analyticity. Characterize analytic function with Cauchy Riemann equations and further properties of partial derivatives.
CO3	Outline the procedure for integration of complex functions. Use Cauchy’s integral formula and its consequences to prove most important theorems.
CO4	Compute power series expansion in connected region, annular region of an analytic function.
CO5	Identify different types of singularities and poles, calculate the residue. Use contour integration to find integrals of real valued functions of certain type.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	LINEAR PROGRAMMING
Course Code	**GMMA62**
Class	III year (2016-2017)
Semester	Even
Staff Name	J VIJAYA XAVIER PARITHIPAN
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- This course aims to develop students to use quantitative methods and techniques for effective decision making, mathematical model formulation and applications that are used in solving real life problems.

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 01-12-2016
1-L1	Introduction of linear programming Problems
2-L2	Formation of linear programming problem.
3- L3	Solved problems in LPP.
4-L4	Exercise problem in LLPP.
5-L5	Mathematical formulation of a LPP.
6-L6	LPP in summation Notation and Matrix Form.
7-L7	Canonical form in Linear programming problem
8-L8	Remarks in LPP.
9-L9	Standard form of LPP.
10-P1	**Inauguration of Mathematics Association**
11-L10	Solved problems.
12-L11	Solved problems to find basic feasible solution.
13-L12	Theorems on basic feasible solutions.
14-L13	Theorems on basic feasible solutions.
15-L14	Notations and illustration of the problems
16-L15	Solved and exercise problems.
17-L16	Introduction of Graphical method.
18-L17	Non-negative constrains and constrains of the form ax_1+ax_2
19-L18	Optimizing objective function and its methods.
20-L19	Solved problems in Graphical method.
21-L20	Exercise problems in Graphical method.
22-L21	Introduction of Simplex method.
23-L22	Steps to solve simplex method. - **Allotting portion for Internal Test-I**
	Internal Test I begins(24-01-2017)

24-L23	Solved and exercise problems using simplex method.
25-L24	Problems based on unbounded solutions.
26-IT-1	**Internal Test-I**
27-L25	UNIT-II Introduction of Big M-method.
28-L26	Examples for the Big M- method.
29-L27	Algorithm for Big M- method.
30-L28	Solved problems in Big M- method. - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Exercise problems in Big M- method.
32- L30	Problems in Big M- method.
33- L31	Introduction to Two phase method
34-P2	**College level meeting/Cell function**
35- L32	Problems based on phase –I methods
36- L33	Problems based on phase – II methods.
37- L34	Exercise and Solved problems in 2-phase method.
38- L35	Applications of simplex method.
39- L36	Solution of simultaneous linear equations for simplex method.
40- L37	Problems based on it
41- L38	Inverting a non-singular matrix by simplex method
42- L39	Problems based on it.
43- L40	Introduction of Primal and dual.
44- L41	Lemma and remarks.
45- L42	Fundamental theorem of Duality.
46- L43	Algorithm of Dual Simplex method.
47- L44	Problems based on it.
48- L45	UNIT- III Introduction of Transportation problems.
49- L46	Mathematical formulation and Definition of TP
50- L47	Remark and Theorems in TP
51- P3	**Department Seminar**
52- L48	Dual of a Transportation problem.
53- L49	Solution algorithm for Transportation problem.
54- L50	Algorithm of North West Corner rule.
55- L51	Problems on North West Corner rule.
56-L52	Algorithm of Row Minima Method- **Allotting portion for Internal Test-II**
	Internal Test II begins(24-02-2017)
57-L53	Problems on Row Minima Method
58-L54	Algorithm of Column Minima Method
59-IT-II	**Internal Test-II**
60- L55	Problems on Column Minima Method
61- L56	Algorithm of Least Cost Method. - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems on least cost method.
63- L58	Algorithm of Vogel Approximation method.
64- L59	Problems on Vogel Approximation method.
65- L60	Determiningthe entering and leaving variable.
66- L61	Degeneracy in TP and MODI method.
67- L62	Problems based on MODI method.

68- L63	**UNIT-IV** Introducation of Assignment Problem
69- L64	Mathematical formulation and solution to assignment problem
70- L65	Hungarian Algorithm for solving Assignment problems
71- L66	Exercise and problems in Assignment problems
72- L67	Theorems and problems in Assignment problems
73- L68	UNIT-V Introduction to sequencing.
74-P4	**College level meeting/ function**
75- L69	Introduction of processing Jobs in 2 machine
76- L70	Algorithm and problems based on it.
77- L71	Introduction of processing n Jobs in m machine.
78- L72	Algorithm and problems based on it.
79- L73	Introduction of processing 2 jobs in ma machine. - **Allotting portion for Internal Test-III**
	Internal Test III begins(23-03-2017)
80- L74	Introduction of Graphical method
81- L75	Algorithm on Graphical method
82-IT-III	**Internal Test-III**
83- L76	Problems on Graphical method
84- L77	Exercise and problems - **Test Paper distribution and result analysis**
85- L78	Exercise and problems on Graphical method.
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (05-04-2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course Linear Programming Problems
CO1	Enable the students to solve real life problems in Business Management.
CO2	Formulate Linear Programming Problem (LPP), find its solution by graphical method and identify the special cases of solution.
CO3	Predict solutions of different types of LPP using appropriate methods, namely, simplex, Big M and two-phase method.
CO4	Exploit the concept of dual simplex method and solve LPP.
CO5	Solve transportation and assignment problems using primal dual algorithm and extend it for special cases.
CO6	Propose the best strategy in a game using different decision making tools.

CO7	Demonstrate the use of simplex method in analyzing the sensitivity of the optimal solution in terms of change in the cost vector/ requirement vector/coefficient matrix/addition or deletion of variable.
CO8	Get interest in Management studies

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	MECHANICS
Course Code	**GMMA63**
Class	III year (2016-2017)
Semester	Even
Staff Name	K STALIN ALEXIS
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The course mainly deals with two major areas of applied mathematics namely Statics and Dynamics.
- Statics is the branch of mechanics that is concerned with the analysis of loads (force and torque, or "moment") acting on physical systems that do not experience an acceleration (a=0), but rather, are in static equilibrium with their environment.
- Whereas the dynamics is a branch of applied mathematics (specifically classical mechanics) concerned with the study of forces and torques and their effect on motion.
- Brief introduction to central forces to the learners becomes essential as we live in the era of satellites, missiles and space explorations.

Syllabus

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: Sections10.1, 10.2)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 01-12-2016
1-L1	UNIT – I Introduction
2-L2	Forces acting at a point
3- L3	Parallelogram law of forces
4-L4	Exercise Problems 1,2
5-L5	Triangle of forces
6-L6	The polygon of forces
7-L7	Lami’s theorem
8-L8	Exercise Problems
9-L9	Find the resultant of any number of coplanar places
10-P1	**Inauguration of Mathematics Association**
11-L10	Parallel forces & moments
12-L11	Unit of moment &Valigen’s theorem
13-L12	Exercise problems 1,2
14-L13	Moment of a force about on axis
15-L14	Unit – II Equilibrium of forces
16-L15	Equilibrium of three forces acting on a rigid body
17-L16	Coplanar forces
18-L17	Trignometrical theorems
19-L18	Example problem 1 , 2
20-L19	Friction laws of friction
21-L20	Coefficient and Angle of friction
22-L21	Equilibrium of a particle on a inclined plane
23-L22	Equilibrium of a particle on a inclined plane under a parallel force **Allotting portion for Internal Test-I**
	Internal Test I begins(24-01-2017)
24-L23	Equilibrium of a body on a inclined plane under any force
25-L24	Exercise problem 3, 4
26-IT-1	**Internal Test-I**
27-L25	Problems of parallel forces

28-L26	Unit – III Projectiles introduction
29-L27	Definitions and fundamental principles
30-L28	Show that the path of the projectile is parabola **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Characteristics of the motion of the projectile
32- L30	Worked examples 1,2
33- L31	Determine the horizontal range of a projectile
34-P2	**College level meeting/Cell function**
35- L32	Velocity of the projectile at time t
36- L33	Example problem 40, 42
37- L34	Range on an inclined plane
38- L35	Range on an inclined plane is maximum
39- L36	Time of flight
40- L37	Greatest distance S of the projectile from the inclined plane
41- L38	Time taken to reach the greatest distance
42- L39	Initial velocity of projection
43- L40	Example problems 43, 44
44- L41	Enveloping parabola
45- L42	Exercise problems 1, 2
46- L43	Unit – IV Simple harmonic motion
47- L44	SHM in a straight line
48- L45	General solution of the SHM
49- L46	Geometrical representation of SHM
50- L47	Example problem 1, 2
51- P3	**Department Seminar**
52- L48	Composition of 2 SHM of the same period in a straight line
53- L49	Composition of 2 SHM of the same period in a directions
54- L50	Example problem 22, 23
55- L51	SHM on a curve
56-L52	Period of oscillation of a simple pendulum **-Allotting portion for Internal Test-II**
	Internal Test II begins(24-02-2017)
57-L53	Simple equivalent pendulum
58-L54	Seconds pendulum
59-IT-II	**Internal Test-II**
60- L55	Loss or gain of oscillation made by a pendulum
61- L56	Example problem 27, 28 **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Unit – V motion under the action of central forces
63- L58	Velocity and acceleration in polar co-ordinates
64- L59	Example problem 1,2
65- L60	Differential equation of central orbit in polar co-ordinates
66- L61	Perpendicular from the pole on the tangent
67- L62	Pedal equation of the central orbit
68- L63	Pedal equation of standard curves
69- L64	Example problem 13, 14

70- L65	Velocities in a central orbit
71- L66	Two fold problems in central orbits
72- L67	Example problems 15, 16
73- L68	Apses and apsidal distance
74-P4	**College level meeting/ function**
75- L69	Law of the inverse square
76- L70	Example problems 34,35
77- L71	Law of the inverse principle
78- L72	SHM in a straight angle
79- L73	General solution of the SHM **Allotting portion for Internal Test-III**
	Internal Test III begins(23-03-2017)
80- L74	Geometrical representation of SHM law
81- L75	Apses and apsidal distance
82-IT-III	**Internal Test-III**
83- L76	Two fold problems in central orbits
84- L77	Solved problems - **Test Paper distribution and result analysis**
85- L78	Exercise problems
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (05-04-2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course Mechanics
CO1	Learners will gain knowledge about Mechanics of particle and Mechanics of a system of particles with constraints.
CO2	Acquisition of knowledge about D'Alembert's Principle, Lagrange's equation and Hamilton's Principle.
CO3	Outline basics that are governing system of forces.
CO4	explain the idea of couples and illustrate equilibrium of three forces acting on a rigid body in appropriate physical systems. .
CO5	Examine resultant of coplanar forces under various circumstances. Define and apply the concept of friction
CO6	Define principles of conservation of momentum and apply the concept of direct impact and oblique impact in collision of objects.
CO7	Describe the orbit of a moving particle under the action of central forces and compute moment of inertia.
CO8	Enable the students with the basic knowledge of equilibrium of a

	particle. Enable the students to develop a working knowledge to handle practical problems.
CO9	Knowledge gained about one-body problem, the virial theorem and the Kepler problem.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Graph Theory
Course Code	**GMMA64**
Class	III year (2016-2017)
Semester	Even
Staff Name	G.S.GRACE PREMA
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- A graph is a symbolic representation of a network and of its connectivity.
- It implies an abstraction of the reality so it can be simplified as a set of linked nodes. Graph theory is a branch of mathematics concerned about how networks can be encoded and their properties measured.
- It has been enriched in the last decades by growing influences from studies of social and complex networks.
- The origins of graph theory can be traced to Leonhard Euler who devised in 1735 a problem that came to be known as the "Seven Bridges of Konigsberg".

Syllabus

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 atree.

(Chapter 5 and 6)

Unit 4: Definition and properties of planar graphs- Characterisation of planargraphs- 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: Sections10.1, 10.2)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 01-12-2016
1-L1	Unit-1 Introduction
2-L2	Definitions and examples of Graph
3- L3	Degrees
4-L4	Problems
5-L5	Sub graphs
6-L6	Spanning sub graph
7-L7	Definitions and examples of spanning sub graph
8-L8	Isomorphism
9-L9	Definitions of automorphism and remark
10-P1	**Inauguration of Mathematics Association**
11-L10	Ulam's conjecture and problems
12-L11	Ramsey numbers
13-L12	Problems of Ramsey number
14-L13	Independent sets and coverings
15-L14	Intersection graphs and line graphs
16-L15	Matrices
17-L16	Operations on graphs
18-L17	Unit-2 Degree sequence
19-L18	Examples and problems
20-L19	Graphic sequences
21-L20	Definition and theorem
22-L21	Algorithm and theorem
23-L22	Definition- walk, trails and paths- **Allotting portion for Internal Test-I**
	Internal Test I begins (24-01-2017)
24-L23	Length of the walk and examples
25-L24	Theorems
26-IT-1	**Internal Test-I**
27-L25	Connected- definition and examples
28-L26	Connectedness related theorems

29-L27	Bipartite-Definition and theorems
30-L28	Definition of cut point, disconnected graph, Bridge - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Blocks- Definitions related examples
32- L30	Theorems on Blocks
33- L31	Definition of connectivity and examples
34-P2	**College level meeting/Cell function**
35- L32	Definition of n-connected, n-line connected
36- L33	Problems related k-connected graph
37- L34	Problems in k-connected graph
38- L35	Problems in k-connected graph
39- L36	Book back one words
40- L37	Unit-3 Introduction
41- L38	Definition of Eulerian and lemma
42- L39	Eulerian related theorem and corollary
43- L40	Fleury's algorithm
44-L41	Definition – Hamiltonian cycle
45- L42	Hamiltonian graph and examples
46- L43	Definition-theta graph and theorems
47- L44	Theorem –Necessary condition for a graph to be Hamiltonian
48- L45	Dirac 's theorem
49- L46	Problems for non-Hamiltonian
50- L47	Definition-Acyclic graph, Tree, examples
51- P3	**Department Seminar**
52- L48	Theorems related to tree
53- L49	Definition – spanning tree and theorem
54- L50	Definition- Eccentricity, radius r(G), examples
55- L51	Definitions-centres of G, and theorems
56-L52	Book back one word- **Allotting portion for Internal Test-II**
	Internal Test II begins(24-02-2017)
57-L53	Unit-4 Definition- planarity and example
58-L54	Definition – Non planar and theorem
59-IT-II	**Internal Test-II**
60- L55	Theorems related to embedding plane
61- L56	Theorems-Euler's polyhedron formula- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Corollary related to plane graph
63- L58	Definition- Maximal planar, corollary
64- L59	Definition- Elementary subdivision, Homeomorphic and examples
65- L60	Problems related to homeomorphic
66- L61	Definition- Colourability, example, chromatic numb
67- L62	Definition- Chromatic partitioning, examples
68- L63	Definition- uniquely colourable, theorems
69- L64	Definition- Edge colouring, Edge chromatic number
70- L65	Theorem related to edge chromatic number
71- L66	Unit-5 Five Colour theorem

72- L67	Chromatic polynomials , theorem
73- L68	Problems related to chromatic polynomial
74-P4	**College level meeting/function**
75- L69	Definition- Directed graph, In degree
76- L70	Definition- Isomorphism and Directed walk
77- L71	Examples
78- L72	Definitions- length, directed cycle
79- L73	Definitions- **Allotting portion for Internal Test-III (23-03-2017)**
	Internal Test III begins 23.3.2017
80- L74	Definitions- reachable, unilateral
81- L75	Definition- Strongly connected and theorem
82-IT-III	**Internal Test-III**
83- L76	Definition- Eulerian trail, Eulerian
84- L77	Theorem related to Eulerian - **Test Paper distribution and result analysis**
85- L78	Theorem related to Eulerian
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (05-04-2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course Graph Theory
CO1	Demonstrate graphs with examples and represent a graph by matrices.
CO2	Identify and construct Eulerian and Hamiltonian graphs.
CO3	Describe the properties of trees and able to examine minimal spanning tree for a given weighted graph.
CO4	discuss colouring concept of vertices and edges of a graph
CO5	Analyze planar graphs and its properties, and classify the connectedness of directed graph.
CO6	Gain the skills to apply the theory to solve various mathematical problems.
CO7	Have an in-depth knowledge of colouring and planarity.
CO8	Know the methods of representing networks in computer science and other fields.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	NUMERICAL METHODS
Course Code	**GSMA3A**
Class	II year (2016-2017)
Semester	Even
Staff Name	A.AlwynAsir
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- The aim of this course is to enable the students to acquire basic tools in numerical methods for solving real life problems in business, industry, agriculture and medicine.

Syllabus

Numerical Methods

Text: Numerical Analysis by Dr.S.Arumugam and Isac.

Unit 1: Simultaneous equations-back subsititution-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 operatos-Other difference operators-Newton's interpolation-Central Difference Interpolation formula.

(Chapter 3: Section3.1, 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 50)

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)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 01.12.2016
1-L1	UNIT-I Introduction on Simultaneous equations
2-L2	Notes on Simultaneous equations
3- L3	Introduction on Back substitution method
4-L4	Introduction on Gauss Elimination method
5-L5	Gauss – Jordan Elimination method
6-L6	Problems on Gauss Elimination method
7-L7	Problems on Gauss – Jordan Elimination method
8- P1	**Inauguration of Mathematics Association**
9- L8	Calculation of inverse of a matrix
10- L9	Gauss – Seidal Iteration method
11-L10	Problems on Gauss – Seidal Iteration method
12-L11	UNIT-II Introduction on Difference operators
13-L12	Properties of the operator Δ
14-L13	Introduction on Forward and Backward differences
15-L14	Introduction on Central differences operator **Allotting portion for Internal Test-I**
	Internal Test I begins (24.01.2017)
16-L15	Problems on Forward, Backward Central differences
17-IT-1	**Internal Test-I**
18-L16	Other difference operators- Theorems and operators
19-L17	Newton's Forward and Backward Interpolation formula. - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Gauss Forward and Backward Interpolation formula.
21- L19	Stirling's formula and Problems
22- P2	**College level meeting/Cell function**
23-L20	UNIT-III Lagrange's interpolation formula
24-L21	Problems on Lagrange's interpolation formula
25-L22	Divided difference derivation and example
26-L23	Relation between Divided difference and forward difference
27-L24	Problems using Divided difference formula
28-L25	Newton's Divided difference formula
29-L26	Problems using Newton's Divided difference formula
30-L27	Inverse interpolation - Lagrange's method
31-L28	Introduction on Iterative method

32-L29	Problems on Iterative method
33-L30	UNIT-IV Introduction on Numerical differentiation
34- P3	**Department Seminar**
35-L31	Derivatives using Newton's forward difference formula
36-L32	Derivatives using Newton's backward difference formula - **Allotting portion for Internal Test-II**
	Internal Test II begins (24.02.2017)
37- L33	Derivatives using Stirling's formula
38- IT-II	**Internal Test-II**
39-L34	Introduction on Maxima and minima of the interpolation polynomial
40-L35	Problems using Newton's forward difference formula **-Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Problems using Newton's backward difference formula
42- L37	Stirling's formula derivative Problems
43- L38	Maxima and minima Problems
44- P4	**College level meeting/ function**
45-L39	Maxima and minima Problem
46-L40	UNIT-V Introduction
47-L41	Numerical Integration introduction
48-L42	Newton's cote's quadrature formula
49-L43	Trapezoidal rule derivation and Geometrical representation
50-L44	Simpson's one – third rule - **Allotting portion for Internal Test-III**
	Internal Test III begins (23.03.2017)
51 L45	Simpson's three – eight rule
52- L46	Error's in Trapezoidal and Simpson's rule
53-IT-III	**Internal Test-III**
54-L47	Problems using Trapezoidal and Simpson's rule
55-L48	Problems using Simpson's three – eight rule **-Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test 5.4.2017**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21.04.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Numerical methods "
CO1	Demonstrate various numerical methods and use them to solve algebraic, transcendental and system of linear equations.
CO2	Identify interpolations on equal/unequal intervals and solve relevant problems using appropriate methods.
CO3	Use numerical methods with various mathematical operations such as differentiation and integration
CO4	Demonstrate to obtain measures of central tendencies /dispersion with examples.
CO5	Apply the basic probability rules to solve problems and calculate correlations.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Vector Calculus & Fourier Series
Course Code	**JAMA21**
Class	II year (2016-2017)
Semester	Even
Staff Name	Mrs.SShyamala Malini
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To provide basic knowledge of vector differentiation and integration
- To solve integration problems

Syllabus

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)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07.12.2017
1-L1	Introduction
2-L2	Vector differentiation
3- L3	Vector differentiation
4-L4	Vector differentiation
5-L5	Vector differentiation
6-L6	Vector differentiation
7-L7	Gradient
8-L8	Gradient
9-L9	Gradient
10-P1	**Inauguration of Mathematics Association**
11-L10	Gradient
12-L11	Gradient
13-L12	Divergence and curl
14-L13	Divergence and curl
15-L14	Divergence and curl
16-L15	Divergence and curl
17-L16	Divergence and curl
18-L17	Evaluation of double integrals
19-L18	Evaluation of double integrals
20-L19	Evaluation of double integrals
21-L20	Evaluation of double integrals
22-L21	Evaluation of double integrals
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins (22.01.2018)
24-L23	Exercise Problems
25-L24	Exercise Problems
26-IT-1	**Internal Test-I**
27-L25	Evaluation of triple integrals
28-L26	Evaluation of triple integrals
29-L27	Evaluation of triple integrals
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Evaluation of triple integrals
32- L30	Evaluation of triple integrals
33- L31	Evaluation of triple integrals
34-P2	**College level meeting/Cell function**
35- L32	Exercise Problems
36- L33	Exercise Problems
37- L34	Vector integration
38- L35	Vector integration
39- L36	Vector integration
40- L37	Vector integration
41- L38	Vector integration

42- L39	Line integrals
43- L40	Line integrals
44- L41	Line integrals
45- L42	Surface integrals
46- L43	Surface integrals
47- L44	Surface integrals
48- L45	volume integrals
49- L46	volume integrals
50- L47	volume integrals
51- P3	**Department Seminar**
52- L48	Green's, Stokes and Divergence theorems (without proof)
53- L49	Green's Theorem problems
54- L50	Green's Theorem problems
55- L51	Stokes Theorem problems
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(26.02.2018)
57-L53	Stokes Theorem problems
58-L54	Divergence theorems problems
59-IT-II	**Internal Test-II (**
60- L55	Divergence theorems problems
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Exercise Problems
63- L58	Fourier series
64- L59	Fourier series
65- L60	Fourier series
66- L61	Fourier series
67- L62	Fourier series
68- L63	Even and odd functions
69- L64	Even and odd functions
70- L65	Even and odd functions
71- L66	Even and odd functions
72- L67	Half range Fourier series
73- L68	Half range Fourier series
74-P4	**College level meeting/ function**
75- L69	Half range Fourier series
76- L70	Half range Fourier series
77- L71	Exercise Problem Discussions
78- L72	Exercise Problem Discussions
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(01.04.2018)
80- L74	Revision
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal

86-MT	**Model Test (12.04.2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Vector Calculus & Fourier Series"
CO1	Acquiring knowledge on vector differentiation and vector integration.
CO2	Gaining knowledge on evaluation of double & triple integrals.
CO3	Know about Green's, Stokes and Divergence theorem.
CO4	Gaining knowledge on Fourier series.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2016-2017)

(Prepared by staff member handling the course)

Programme Name	B.Sc Mathematics
Course Name	Statistics II
Course Code	**JAST21**
Class	I year (2016-2017)
Semester	Even
Staff Name	Mrs. T. Santhakumari
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To know the concept of index numbers
- To study the distribution functions
- To understand the Analysis of variance

Syllabus

MSU/2016-17/UG-Colleges/Part-III(B.Sc.Mathematics)Semester-II /Allied-II
(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 varience-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.

Text Book:

1.Gupta.S.C&V.K.Kapoor-Fundamentals of Mathematical Statistics-(2002)Sultan Chand&Sons,New Delhi.

Books for Reference:

1.Vittal.P.R-Mathematical Statistic(2004)-Maragatham Publications
2.DC Sancheti&Kapoor-Statistics
3.M.L.Khanna-Statistics
4.S.Arumugam&others-Statistics

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 01.12.2016
1-L1	Introduction
2-L2	Characteristics of index numbers
3- L3	Characteristics of index numbers
4-L4	Laspeyer's and Paasche's
5-L5	Laspeyer's and Paasche's
6-L6	Fisher's andBowley's Marshall and Edgeworth’s index numbers
7-L7	Fisher's andBowley's Marshall and Edgeworth’s index numbers
8-L8	Tests
9-L9	Unit test
10-P1	**Inauguration of Mathematics Association**
11-L10	Commodity Reversal test
12-L11	Time Reversal test
13-L12	circular test
14-L13	circular test
15-L14	Testing of Hypothesis
16-L15	Testing of Hypothesis
17-L16	Testing of Hypothesis
18-L17	Null hypothesis and Alternate hypothesis
19-L18	Null hypothesis and Alternate hypothesis
20-L19	Type I andType II errors
21-L20	Type I andType II errors
22-L21	Critical Region,Level of significance
23-L22	Problem Disscussion - **Allotting portion for Internal Test-I**
	Internal Test I begins(24.01.2017)
24-L23	Critical Region,Level of significance
25-L24	Critical Region,Level of significance

26-IT-1	**Internal Test-I**
27-L25	Critical Region,Level of significance
28-L26	Test of significance for large samples
29-L27	Test of significance for large samples
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Test of significance for large samples
32- L30	Testing a single proportion
33- L31	Testing a single proportion
34-P2	**College level meeting/Cell function**
35- L32	Difference of proportions,Testing a single mean and Difference of means.
36- L33	Difference of proportions,Testing a single mean and Difference of means.
37- L34	Tests based on t-distribution
38- L35	Tests based on t-distribution
39- L36	Tests based on t-distribution
40- L37	single mean and Difference of means
41- L38	single mean and Difference of means
42- L39	single mean and Difference of means
43- L40	Tests based on F-distribution
44- L41	Tests based on F-distribution
45- L42	Variance Ratio test
46- L43	Variance Ratio test
47- L44	Variance Ratio test
48- L45	Tests based on Chi-square Distribution
49- L46	Tests based on Chi-square Distribution
50- L47	Tests based on Chi-square Distribution
51- P3	**Department Seminar**
52- L48	Independence
53- L49	Independence
54- L50	Goodness of fit
55- L51	Goodness of fit
56-L52	Problem Disscussion - **Allotting portion for Internal Test-II**
	Internal Test II begins24.02.2017)
57-L53	Analysis of varience
58-L54	Analysis of varience
59-IT-II	**Internal Test-II**
60- L55	one way and two way classified data
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	one way and two way classified data
63- L58	Basis ofexperimental design
64- L59	Basis ofexperimental design
65- L60	Basis ofexperimental design
66- L61	Randomized Block Design
67- L62	Randomized Block Design
68- L63	Latin square
69- L64	Simple problems
70- L65	Simple problems

71- L66	Statistical Quality control
72- L67	Statistical Quality control
73- L68	Definition
74-P4	**College level meeting/ function**
75- L69	Advantages,Process control
76- L70	Advantages,Process control
77- L71	Advantages,Process control
78- L72	Controlchart, Mean chart, Range chart, P-chart, Product Control
79- L73	Problem Disscussion - **Allotting portion for Internal Test-III**
	Internal Test III begins(23.03.2017)
80- L74	sampling InspectionPlans.
81- L75	Sampling InspectionPlans.
82-IT-III	**Internal Test-III**
83- L76	Sampling InspectionPlans
84- L77	**Test Paper distribution and result analysis**
85- L78	Sampling InspectionPlans
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (05.04.2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21.04.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Statistics II"
CO1	Students acquire the knowledge on Basic concepts of Sampling and testing of Hypothesis.
CO2	Learners knowledge of Testing of Hypothesis for real life problems and for small samples.
CO3	Gain knowledge about various types of Estimators.
CO4	Learners learn the Concepts of Correlation and rank correlation coefficient.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B.Sc. Mathematics
Course Name	Fuzzy Mathematics
Course Code	**JMMA6A**
Class	III year (2016-2017)
Semester	Even
Staff Name	Dr. Mrs. J. Subhashini
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce fuzzy concepts to students
- To facilitate the students to study fuzzy operations and fuzzy numbers

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-VI/ Major Elective– III (A)

FUZZY MATHEMATICS

Unit I Crisp Sets – Fuzzy Sets – Basic Types – Basic Concepts – Characteristics and Significance of the Paradigm shift.

Unit II Additional properties of α-cuts – representations of fuzzy sets – Extension principle for fuzzy sets.

Unit III Fuzzy set operations – Fuzzy complements – Fuzzy intersections : t-norms – Fuzzy Unions : t-conorms – Combinations of operations – Aggregation operations.

Unit IV Fuzzy Numbers – Linguistic variables – Arithmetic operations on intervals – Arithmetic operations of fuzzy numbers – Lattice of fuzzy numbers – Fuzzy Equations.

Unit V Fuzzy Decision Making – Individual Decision Making – Multi-person decision making – Fuzzy linear Programming.

Text Book: * George J. Klir and Bo Bo Yuan – Fuzzy sets and Fuzzy Logic Theory Applications, Prentice Hall of India, 2002, New Delhi.

Books for Reference :
1. George J. Klir and Tina .A Folger – Fuzzy sets, uncertainty and Informations – Prentice Hall of India, 2003, New Delhi.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2018
1-L1	Introduction
2-L2	Crisp Sets
3- L3	Crisp Sets
4-L4	Fuzzy Sets
5-L5	Fuzzy Sets
6-L6	Fuzzy Sets
7-L7	Basic Types
8-L8	Basic Types
9-L9	Basic Concepts
10-P1	**Inauguration of Mathematics Association**
11-L10	Basic Concepts
12-L11	Characteristics and Significance of the Paradigm shift.
13-L12	Characteristics and Significance of the Paradigm shift.
14-L13	Characteristics and Significance of the Paradigm shift.
15-L14	Additional properties of α-cuts
16-L15	Additional properties of α-cuts
17-L16	Additional properties of α-cuts
18-L17	Additional properties of α-cuts
19-L18	representations of fuzzy sets
20-L19	representations of fuzzy sets
21-L20	representations of fuzzy sets
22-L21	representations of fuzzy sets
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(18-01-2019)
24-L23	Extension principle for fuzzy sets
25-L24	Extension principle for fuzzy sets
26-IT-1	**Internal Test-I**
27-L25	Extension principle for fuzzy sets
28-L26	Extension principle for fuzzy sets
29-L27	Fuzzy set operations
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Fuzzy set operations
32- L30	Fuzzy complements
33- L31	Fuzzy complements

34-P2	**College level meeting/Cell function**
35- L32	Fuzzy intersections : t-norms
36- L33	Fuzzy intersections : t-norms
37- L34	Fuzzy intersections : t-norms
38- L35	Fuzzy Unions : t-conorms
39- L36	Fuzzy Unions : t-conorms
40- L37	Fuzzy Unions : t-conorms
41- L38	Combinations of operations
42- L39	Combinations of operations
43- L40	Combinations of operations
44- L41	Aggregation operations
45- L42	Aggregation operations
46- L43	Aggregation operations
47- L44	Fuzzy Numbers
48- L45	Fuzzy Numbers
49- L46	Linguistic variables
50- L47	Linguistic variables
51- P3	**Department Seminar**
52- L48	Arithmetic operations on intervals
53- L49	Arithmetic operations on intervals
54- L50	Arithmetic operations on intervals
55- L51	Arithmetic operations on intervals
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(25-02-2019)
57-L53	Arithmetic operations of fuzzy numbers
58-L54	Arithmetic operations of fuzzy numbers
59-IT-II	**Internal Test-II**
60- L55	Arithmetic operations of fuzzy numbers
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Lattice of fuzzy numbers
63- L58	Lattice of fuzzy numbers
64- L59	Lattice of fuzzy numbers
65- L60	Lattice of fuzzy numbers
66- L61	Fuzzy Equations
67- L62	Fuzzy Equations
68- L63	Fuzzy Equations
69- L64	Fuzzy Decision Making
70- L65	Fuzzy Decision Making
71- L66	Fuzzy Decision Making
72- L67	Individual Decision Making
73- L68	Individual Decision Making
74-P4	**College level meeting/ function**
75- L69	Individual Decision Making
76- L70	Multi-person decision making
77- L71	Multi-person decision making
78- L72	Multi-person decision making
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**

	Internal Test III begins(22-03-2019)
80- L74	Fuzzy linear Programming
81- L75	Fuzzy linear Programming
82-IT-III	**Internal Test-III**
83- L76	Fuzzy linear Programming
84- L77	**Test Paper distribution and result analysis**
85- L78	Fuzzy linear Programming
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (08-04-2019)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course "Fuzzy Mathematics"
CO1	Acquire basic knowledge on fuzzy concepts to students.
CO2	Facilitate the students to study fuzzy operations and fuzzy numbers.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B.Sc. Mathematics
Course Name	Fuzzy Mathematics
Course Code	**JMMA6A**
Class	III year (2016-2017)
Semester	Even
Staff Name	Dr. Mrs. J. Subhashini
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce fuzzy concepts to students
- To facilitate the students to study fuzzy operations and fuzzy numbers

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-VI/ Major Elective– III (A)

FUZZY MATHEMATICS

Unit I Crisp Sets – Fuzzy Sets – Basic Types – Basic Concepts – Characteristics and Significance of the Paradigm shift.

Unit II Additional properties of α-cuts – representations of fuzzy sets – Extension principle for fuzzy sets.

Unit III Fuzzy set operations – Fuzzy complements – Fuzzy intersections : t-norms – Fuzzy Unions : t-conorms – Combinations of operations – Aggregation operations.

Unit IV Fuzzy Numbers – Linguistic variables – Arithmetic operations on intervals – Arithmetic operations of fuzzy numbers – Lattice of fuzzy numbers – Fuzzy Equations.

Unit V Fuzzy Decision Making – Individual Decision Making – Multi-person decision making – Fuzzy linear Programming.

Text Book: * George J. Klir and Bo Bo Yuan – Fuzzy sets and Fuzzy Logic Theory Applications, Prentice Hall of India, 2002, New Delhi.

Books for Reference :
1. George J. Klir and Tina .A Folger – Fuzzy sets, uncertainty and Informations – Prentice Hall of India, 2003, New Delhi.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03-12-2018
1-L1	Introduction
2-L2	Crisp Sets
3- L3	Crisp Sets
4-L4	Fuzzy Sets
5-L5	Fuzzy Sets
6-L6	Fuzzy Sets
7-L7	Basic Types
8-L8	Basic Types
9-L9	Basic Concepts
10-P1	**Inauguration of Mathematics Association**
11-L10	Basic Concepts
12-L11	Characteristics and Significance of the Paradigm shift.
13-L12	Characteristics and Significance of the Paradigm shift.
14-L13	Characteristics and Significance of the Paradigm shift.
15-L14	Additional properties of α-cuts
16-L15	Additional properties of α-cuts
17-L16	Additional properties of α-cuts
18-L17	Additional properties of α-cuts
19-L18	representations of fuzzy sets
20-L19	representations of fuzzy sets
21-L20	representations of fuzzy sets
22-L21	representations of fuzzy sets
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(18-01-2019)
24-L23	Extension principle for fuzzy sets
25-L24	Extension principle for fuzzy sets
26-IT-1	**Internal Test-I**
27-L25	Extension principle for fuzzy sets
28-L26	Extension principle for fuzzy sets
29-L27	Fuzzy set operations
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Fuzzy set operations
32- L30	Fuzzy complements
33- L31	Fuzzy complements

34-P2	**College level meeting/Cell function**
35- L32	Fuzzy intersections : t-norms
36- L33	Fuzzy intersections : t-norms
37- L34	Fuzzy intersections : t-norms
38- L35	Fuzzy Unions : t-conorms
39- L36	Fuzzy Unions : t-conorms
40- L37	Fuzzy Unions : t-conorms
41- L38	Combinations of operations
42- L39	Combinations of operations
43- L40	Combinations of operations
44- L41	Aggregation operations
45- L42	Aggregation operations
46- L43	Aggregation operations
47- L44	Fuzzy Numbers
48- L45	Fuzzy Numbers
49- L46	Linguistic variables
50- L47	Linguistic variables
51- P3	**Department Seminar**
52- L48	Arithmetic operations on intervals
53- L49	Arithmetic operations on intervals
54- L50	Arithmetic operations on intervals
55- L51	Arithmetic operations on intervals
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(25-02-2019)
57-L53	Arithmetic operations of fuzzy numbers
58-L54	Arithmetic operations of fuzzy numbers
59-IT-II	**Internal Test-II**
60- L55	Arithmetic operations of fuzzy numbers
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Lattice of fuzzy numbers
63- L58	Lattice of fuzzy numbers
64- L59	Lattice of fuzzy numbers
65- L60	Lattice of fuzzy numbers
66- L61	Fuzzy Equations
67- L62	Fuzzy Equations
68- L63	Fuzzy Equations
69- L64	Fuzzy Decision Making
70- L65	Fuzzy Decision Making
71- L66	Fuzzy Decision Making
72- L67	Individual Decision Making
73- L68	Individual Decision Making
74-P4	**College level meeting/ function**
75- L69	Individual Decision Making
76- L70	Multi-person decision making
77- L71	Multi-person decision making
78- L72	Multi-person decision making
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**

	Internal Test III begins(22-03-2019)
80- L74	Fuzzy linear Programming
81- L75	Fuzzy linear Programming
82-IT-III	**Internal Test-III**
83- L76	Fuzzy linear Programming
84- L77	**Test Paper distribution and result analysis**
85- L78	Fuzzy linear Programming
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (08-04-2019)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course "Fuzzy Mathematics"
CO1	Acquire basic knowledge on fuzzy concepts to students.
CO2	Facilitate the students to study fuzzy operations and fuzzy numbers.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc. Mathematics
Course Name	Analytical Geometry
Course Code	**JMMA21**
Class	I year (2016-2017)
Semester	Even
Staff Name	Dr.Mrs.J.Subhashini
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To describe the objects in three dimensions using coordinate system
- To gain some knowledge about planes in a space
- To know about lines and its properties
- Understanding the structure of spheres and intersections of known objects
- To express cones and cylinder using mathematical equations

Syllabus

MSU/2016-17/UG-Colleges/Part-III (B.Sc.Mathematics)/ Semester-II /Core-3

ANALYTICAL GEOMETRY

Unit I Analytical Geometry of 2D Polar co-ordinates. Distance between the points-Area of Triangle-Equation of straight line.

Unit II Circle and conics-simple problems involving chords tangents and normals.

Unit III Analytical Geometry of 3D Co-ordinate system, direction cosines, direction ratios -Equation of planes in different forms-angle between planes. Equation of a line-image of a point-image of a line.

Unit IV Sphere-Tangent plane-circle of intersections-Tangency of Spheres-coaxialsystem of spheres-Radical Planes-Orthogonal Spheres.

Unit V Equation of a cone-cone with vertex at the orgin-Quadratic cone with the vertexatorgin-Right circular cone-Cylinder-Right circular cylinder.

Text Books:
1.T.K.Manicavachagom Pillay and T.Natarajan-A text book of Analytical (Geometry_(Two dimensions)-S.Viswanathan(Printers and Publishers)Pvt.Ltd.
2.T.K.Manicavachagom Pillay and T.Natarajan-A text book of Analytical Geometry (Three dimensions)-S.Viswanathan(Printers and Publishers)Pvt.Ltd.

Books for Reference:
1.Kandasamy.P.and K.Thilagavathi-Mathematics for B.Sc.,Vol.IV-2004 S.Chand and Co.New Delhi.
2.Loney .S.L.-The Elements of Coordinate Geometry-Mcmillan and Company London.
3.Bill .R.J.T-Elementry Treatise on Coordinate Geometry of Three Dimensions-Mcmillan India Ltd.,1994.
4.B.Stephen John-Analytical Geometry of 3D and vector differentiation:IDEAL publication.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 01.12.2016
1-L1	Introduction
2-L2	Analytical Geometry of 2D Polar co-ordinates
3- L3	Analytical Geometry of 2D Polar co-ordinates
4-L4	Analytical Geometry of 2D Polar co-ordinates
5-L5	Distance between the points
6-L6	Distance between the points
7-L7	Area of Triangle
8- P1	**Inauguration of Mathematics Association**
9- L8	Area of Triangle
10- L9	Area of Triangle
11-L10	Equation of straight line
12-L11	Equation of straight line
13-L12	Equation of straight line
14-L13	Equation of straight line
15-L14	Circle and conics
16-L15	Circle and conics
17- L16	Circle and conics
18- L17	simple problems involving chords tangents and normals
19- L18	simple problems involving chords tangents and normals
20- L19	simple problems involving chords tangents and normals
21- L20	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(24.01.2017)
22- L21	simple problems involving chords tangents and normals

23- IT-1	**Internal Test-I**
24- L22	Analytical Geometry of 3D Co-ordinate system
25- L23	Analytical Geometry of 3D Co-ordinate system
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Analytical Geometry of 3D Co-ordinate system
28- L26	Analytical Geometry of 3D Co-ordinate system
29- L27	direction cosines, direction ratios
30- P2	**College level meeting/Cell function**
31-L28	direction cosines, direction ratios
32-L29	direction cosines, direction ratios
33-L30	Equation of planes in different forms-angle between planes
34- L31	Equation of planes in different forms-angle between planes
35- L32	Equation of planes in different forms-angle between planes
36- L33	Equation of planes in different forms-angle between planes
37- L34	Equation of a line-image of a point-image of a line
38- L35	Equation of a line-image of a point-image of a line
39- L36	Equation of a line-image of a point-image of a line
40- L37	Equation of a line-image of a point-image of a line
41- L38	Sphere
42-P3	**Department Seminar**
43- L39	Sphere
44- L40	Tangent plane
45- L41	Tangent plane
46- L42	Tangent plane
47- L43	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(24.02.2017)
48- L44	Tangency of Spheres
49-IT-II	**Internal Test-II**
50-L45	Tangency of Spheres
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	coaxialsystem of spheres
53- L48	coaxialsystem of spheres
54- L49	Radical Planes
55- L50	Radical Planes
56- L51	Orthogonal Spheres
57- L52	Orthogonal Spheres
58- L53	Equation of a cone-cone with vertex at the orgin
59-P4	**College level meeting/ function**
60- L54	Equation of a cone-cone with vertex at the orgin
61- L55	Quadratic cone with the vertexatorgin
62- L56	Quadratic cone with the vertexatorgin
63- L57	Quadratic cone with the vertexatorgin
64- L58	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(23.03.2017)
65- L59	Right circular cone
66- L60	Right circular cone

67-IT-III	**Internal Test-III**
68- L61	Cylinder-Right circular cylinder
69- L62	Cylinder-Right circular cylinder
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (05.04.2017)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21.04.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Analytical Geometry"
CO1	Enable the students to learn and visualize the fundamental ideas about co-ordinate geometry
CO2	On successful completion of the course students should have gained knowledge about the regular geometrical figures and their properties.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc. Mathematics
Course Name	Analytical Geometry
Course Code	**JMMA21**
Class	I year (2016-2017)
Semester	Even
Staff Name	Dr.Mrs.J.Subhashini
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To describe the objects in three dimensions using coordinate system
- To gain some knowledge about planes in a space
- To know about lines and its properties
- Understanding the structure of spheres and intersections of known objects
- To express cones and cylinder using mathematical equations

Syllabus

MSU/2016-17/UG-Colleges/Part-III (B.Sc.Mathematics)/ Semester-II /Core-3

ANALYTICAL GEOMETRY

Unit I Analytical Geometry of 2D Polar co-ordinates. Distance between the points-Area of Triangle-Equation of straight line.

Unit II Circle and conics-simple problems involving chords tangents and normals.

Unit III Analytical Geometry of 3D Co-ordinate system, direction cosines, direction ratios -Equation of planes in different forms-angle between planes. Equation of a line-image of a point-image of a line.

Unit IV Sphere-Tangent plane-circle of intersections-Tangency of Spheres-coaxialsystem of spheres-Radical Planes-Orthogonal Spheres.

Unit V Equation of a cone-cone with vertex at the orgin-Quadratic cone with the vertexatorgin-Right circular cone-Cylinder-Right circular cylinder.

Text Books:
1.T.K.Manicavachagom Pillay and T.Natarajan-A text book of Analytical (Geometry_(Two dimensions)-S.Viswanathan(Printers and Publishers)Pvt.Ltd.
2.T.K.Manicavachagom Pillay and T.Natarajan-A text book of Analytical Geometry (Three dimensions)-S.Viswanathan(Printers and Publishers)Pvt.Ltd.

Books for Reference:
1.Kandasamy.P.and K.Thilagavathi-Mathematics for B.Sc.,Vol.IV-2004 S.Chand and Co.New Delhi.
2.Loney .S.L.-The Elements of Coordinate Geometry-Mcmillan and Company London.
3.Bill .R.J.T-Elementry Treatise on Coordinate Geometry of Three Dimensions-Mcmillan India Ltd.,1994.
4.B.Stephen John-Analytical Geometry of 3D and vector differentiation:IDEAL publication.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 01.12.2016
1-L1	Introduction
2-L2	Analytical Geometry of 2D Polar co-ordinates
3- L3	Analytical Geometry of 2D Polar co-ordinates
4-L4	Analytical Geometry of 2D Polar co-ordinates
5-L5	Distance between the points
6-L6	Distance between the points
7-L7	Area of Triangle
8- P1	**Inauguration of Mathematics Association**
9- L8	Area of Triangle
10- L9	Area of Triangle
11-L10	Equation of straight line
12-L11	Equation of straight line
13-L12	Equation of straight line
14-L13	Equation of straight line
15-L14	Circle and conics
16-L15	Circle and conics
17- L16	Circle and conics
18- L17	simple problems involving chords tangents and normals
19- L18	simple problems involving chords tangents and normals
20- L19	simple problems involving chords tangents and normals
21- L20	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(24.01.2017)
22- L21	simple problems involving chords tangents and normals

23- IT-1	**Internal Test-I**
24- L22	Analytical Geometry of 3D Co-ordinate system
25- L23	Analytical Geometry of 3D Co-ordinate system
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Analytical Geometry of 3D Co-ordinate system
28- L26	Analytical Geometry of 3D Co-ordinate system
29- L27	direction cosines, direction ratios
30- P2	**College level meeting/Cell function**
31-L28	direction cosines, direction ratios
32-L29	direction cosines, direction ratios
33-L30	Equation of planes in different forms-angle between planes
34- L31	Equation of planes in different forms-angle between planes
35- L32	Equation of planes in different forms-angle between planes
36- L33	Equation of planes in different forms-angle between planes
37- L34	Equation of a line-image of a point-image of a line
38- L35	Equation of a line-image of a point-image of a line
39- L36	Equation of a line-image of a point-image of a line
40- L37	Equation of a line-image of a point-image of a line
41- L38	Sphere
42-P3	**Department Seminar**
43- L39	Sphere
44- L40	Tangent plane
45- L41	Tangent plane
46- L42	Tangent plane
47- L43	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(24.02.2017)
48- L44	Tangency of Spheres
49-IT-II	**Internal Test-II**
50-L45	Tangency of Spheres
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	coaxialsystem of spheres
53- L48	coaxialsystem of spheres
54- L49	Radical Planes
55- L50	Radical Planes
56- L51	Orthogonal Spheres
57- L52	Orthogonal Spheres
58- L53	Equation of a cone-cone with vertex at the orgin
59-P4	**College level meeting/ function**
60- L54	Equation of a cone-cone with vertex at the orgin
61- L55	Quadratic cone with the vertexatorgin
62- L56	Quadratic cone with the vertexatorgin
63- L57	Quadratic cone with the vertexatorgin
64- L58	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(23.03.2017)
65- L59	Right circular cone
66- L60	Right circular cone

67-IT-III	**Internal Test-III**
68- L61	Cylinder-Right circular cylinder
69- L62	Cylinder-Right circular cylinder
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (05.04.2017)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21.04.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Analytical Geometry"
CO1	Enable the students to learn and visualize the fundamental ideas about co-ordinate geometry
CO2	On successful completion of the course students should have gained knowledge about the regular geometrical figures and their properties.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc. Mathematics
Course Name	Differential Equations
Course Code	**JMMA22**
Class	I year (2016-2017)
Semester	Even
Staff Name	Dr.Mrs. J. Suresh suseela, Dr. Mr. J. vijaya Xavier parthiban
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Identify the type of a given differential equations and select and apply the appropriate analytical technique for finding the solution of first order abd selected higher order ODE
- Evaluate first order differential equations including separable, homogeneous, exact and linear.
- Solve linear systems of ordinary differential equations
- Solve differential equations using variation of parameters.

Syllabus

DIFFERENTIAL EQUATIONS

Unit I First order higher degree equations-solvable for x,y,p and Clairaut's form Simultaneous differential equations of the form $f_1(D)x+g_1(D)y=h_1(t)$, $f_2(D)x+g_2(D)y=h_2(t)$

Unit II (Ordinary differential equation)Second order linear differential equations with constant coefficients-Find theP.I for functions of the form e^{ax} f(x)and x^n f(x)

Unit III Linear equations of second order with variable coefficients-Homogeneous equations-Equation reducible to homogeneous equation.

Unit IV (Partial differential equations)Formation of equations by elimination of arbitrary constants and functions-Definition of general, particular and complete solutions-solving standard formsf(p,q)=0, f(x,p,q)=0, f(y,p,q)=0, f(z,p,q)=0, f(x,p)=f(y,q), z=px+ qy+f(p,q) - Lagrange's differential equations $P_p+Q_q=R$

Unit V Application of differential equations-Growth and Decay-chemical reaction-Newton's law of cooling-Brochistocrone problem-simple electric circuits.

Text Book:
1.Narayanan .S and T.K.Manickavachagam Pillai-Differential equations and its applications,2003-S.Viswanathan Printers.

Books for Reference:
I Kandasamy.P and K.Thilagavathi-Mathematics for B.Sc.,Vol.III-2004-S.Chand and Co.,New Delhi.
2 Braun.M.-Differential Equations and their applications(III edition)Springer-Verlag, New York 1983)
3 Boyce.W.E and R.C.Diprima-Elementary differential equations and Boundary value Problems(VII editions)-John Wiley and Sons,Inc,New York 2001.
4 Sankaranarayan and Manguldoss-Differential Equations.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 01.12.2016
1-L1	Introduction
2-L2	First order higher degree equations
3- L3	First order higher degree equations
4-L4	First order higher degree equations
5-L5	First order higher degree equations
6-L6	solvable for x,y,p and Clairaut's form Simultaneous differential equations of the form $f_1(D)x+g_1(D)y=h_1(t)$, $f_2(D)x+g_2(D)y=h_2(t)$
7-L7	solvable for x,y,p and Clairaut's form Simultaneous differential equations of the form $f_1(D)x+g_1(D)y=h_1(t)$, $f_2(D)x+g_2(D)y=h_2(t)$
8- P1	**Inauguration of Mathematics Association**
9- L8	solvable for x,y,p and Clairaut's form Simultaneous differential equations of the form $f_1(D)x+g_1(D)y=h_1(t)$, $f_2(D)x+g_2(D)y=h_2(t)$
10- L9	(Ordinary differential equation)Second order linear differential equations with constant coefficients
11-L10	(Ordinary differential equation)Second order linear differential equations with constant coefficients
12-L11	(Ordinary differential equation)Second order linear differential equations with constant coefficients
13-L12	(Ordinary differential equation)Second order linear differential equations with constant coefficients
14-L13	Find theP.I for functions of the form eax f(x)and xn f(x)
15-L14	Find theP.I for functions of the form eax f(x)and xn f(x)

16-L15	Find theP.I for functions of the form eax f(x)and xn f(x)
17- L16	Find theP.I for functions of the form eax f(x)and xn f(x)
18- L17	Find theP.I for functions of the form eax f(x)and xn f(x)
19- L18	Problem Discussion
20- L19	Problem Discussion
21- L20	Problem Discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins(24.01.2017)
22- L21	Linear equations of second order with variable coefficients
23- IT-1	**Internal Test-I**
24- L22	Linear equations of second order with variable coefficients
25- L23	Linear equations of second order with variable coefficients
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Linear equations of second order with variable coefficients
28- L26	Homogeneousequations
29- L27	Homogeneousequations
30- P2	**College level meeting/Cell function**
31-L28	Homogeneousequations
32-L29	Homogeneousequations
33-L30	Equation reducible to homogeneous equation
34- L31	Equation reducible to homogeneous equation
35- L32	Equation reducible to homogeneous equation
36- L33	Equation reducible to homogeneous equation
37- L34	(Partial differential equations)Formation of equations by elimination of arbitrary constants and functions
38- L35	(Partial differential equations)Formation of equations by elimination of arbitrary constants and functions
39- L36	(Partial differential equations)Formation of equations by elimination of arbitrary constants and functions
40- L37	(Partial differential equations)Formation of equations by elimination of arbitrary constants and functions
41- L38	solving standard formsf(p,q)=0, f(x,p,q)=0, f(y,p,q)=0, f(z,p,q)=0, f(x,p)=f(y,q), z=px+ qy+f(p,q)
42-P3	**Department Seminar**
43- L39	solving standard formsf(p,q)=0, f(x,p,q)=0, f(y,p,q)=0, f(z,p,q)=0, f(x,p)=f(y,q), z=px+ qy+f(p,q)
44- L40	solving standard formsf(p,q)=0, f(x,p,q)=0, f(y,p,q)=0, f(z,p,q)=0, f(x,p)=f(y,q), z=px+ qy+f(p,q)
45- L41	solving standard formsf(p,q)=0, f(x,p,q)=0, f(y,p,q)=0, f(z,p,q)=0, f(x,p)=f(y,q), z=px+ qy+f(p,q)
46- L42	Peoblem Discussion
47- L43	Problem Discussion - **Allotting portion for Internal Test-II**
	Internal Test II begins(24.02.2017)
48- L44	Lagrange's differential equations Pp+Qq=R
49-IT-II	**Internal Test-II**
50-L45	Lagrange's differential equations Pp+Qq=R
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Lagrange's differential equations Pp+Qq=R

53- L48	Growth and Decay
54- L49	Growth and Decay
55- L50	Growth and Decay
56- L51	chemical reaction
57- L52	chemical reaction
58- L53	Newton's law of cooling
59-P4	**College level meeting/ function**
60- L54	Newton's law of cooling
61- L55	Brochistocrone problem
62- L56	Brochistocrone problem
63- L57	Brochistocrone problem
64- L58	Problem Discussion - **Allotting portion for Internal Test-III**
	Internal Test III begins(23.03.2017)
65- L59	simple electric circuits
66- L60	simple electric circuits
67-IT-III	**Internal Test-III**
68- L61	Revision
69- L62	Revision
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (05.04.2017)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21.04.2017

Course Outcomes

Learning Outcomes	**COs** of the course “Differential Equations”
CO1	Enables the students to learn the method of solving Differential Equations. Objectives: End of this course, the students should gain the knowledge about the method of solving Differential Equations.
CO2	It also exposes Differential Equation as a powerful tool in solving problems in Physical and Social sciences.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B.Sc Mathematics
Course Name	Abstract Algebra
Course Code	**JMMA41**
Class	II year (2016-2017)
Semester	Even
Staff Name	Mrs. S.Vijila Velvet Daisy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the concept of Groups ,Ring and Field.
- To study the concept of homomorphism

Syllabus

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 IIINormal 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:

1) Arumugam .S and Tangapandi Issac .A – "Modern Algebra"scitech publications Pvt. Ltd.

Books for Reference :

1) Anton .H and C. Rorres - Elementary Linear Algebra (9th Edn) John Wiley and Sons, Inc., New York 2005.
2) Manicavasagam Pillai .T.K and others – Modern Algebra, S. Viswanathan Publishers, Chennai 1993.
3) Herstein .I.N – Topics in Algebra, Vikas Publishing Pvt. Ltd. 1975, New Delhi.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Introduction
2-L2	Groups
3- L3	Groups
4-L4	definition and Examples
5-L5	Subgroup
6-L6	order of an element
7-L7	order of an element
8-L8	centre of a group
9-L9	Normalizer and centralizer. Product of two subgroups
10-P1	**Inauguration of Mathematics Association**
11-L10	Normalizer and centralizer. Product of two subgroups
12-L11	order of HK
13-L12	Intersection and union of subgroups.
14-L13	Intersection and union of subgroups.
15-L14	Cyclic groups
16-L15	Cyclic groups
17-L16	generators of a cyclic group
18-L17	generators of a cyclic group
19-L18	Number of generators of a cyclic groups
20-L19	Number of generators of a cyclic groups
21-L20	Cosets
22-L21	Partitioning of a group by Cosets
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins (22-01-2018)
24-L23	Partitioning of a group by Cosets
25-L24	Lagrange"s theorem
26-IT-1	**Internal Test-I**
27-L25	Euler"s theorem
28-L26	Fermat"s theorem.
29-L27	Quotient groups

30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Quotient groups
32- L30	Group Homomorphis
33- L31	Canonical homomorphism
34-P2	**College level meeting/Cell function**
35- L32	Canonical homomorphism
36- L33	kernel of a homomorphism
37- L34	kernel of a homomorphism
38- L35	Isomorphism
39- L36	Isomorphism
40- L37	Automorphism
41- L38	Automorphism
42- L39	Inner automorphism
43- L40	Inner automorphism
44- L41	Permutation groups
45- L42	Permutation groups
46- L43	Cayley"s theorem.
47- L44	Cayley"s theorem.
48- L45	Definition and examples
49- L46	Types of rings
50- L47	Types of rings
51- P3	**Department Seminar**
52- L48	Elementary properties of a ring
53- L49	Elementary properties of a ring
54- L50	Integral domain
55- L51	Field
56-L52	Problem Discussion - **Allotting portion for Internal Test-II**
	Internal Test II begins(26-02-2018)
57-L53	Sub rings
58-L54	Subfields
59-IT-II	**Internal Test-II**
60- L55	Subfields
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Ideals
63- L58	Ideals
64- L59	Principal ideal
65- L60	quotient ring
66- L61	Maximal and prime ideals
67- L62	Maximal and prime ideals
68- L63	characteristic of a ring
69- L64	characteristic of a ring
70- L65	PID – UFD
71- L66	Homomorphism of rings
72- L67	Homomorphism of rings
73- L68	Isomorphism
74-P4	**College level meeting/ function**

75- L69	kernel of a homomorphism
76- L70	Fundamental theorem
77- L71	Fundamental theorem
78- L72	Field of quotients of an integral domain
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(01-04-2018)
80- L74	polynomial rings
81- L75	polynomial rings
82-IT-III	**Internal Test-III**
83- L76	Division algorithm
84- L77	**Test Paper distribution and result analysis**
85- L78	Division algorithm
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (12-04-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Abstract Algebra”
CO1	Acquire knowledge on the concept of Groups, Ring and Field.
CO2	Gaining knowledge on the concept of homomorphism.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Linear Algebra
Course Code	**JMMA61**
Class	III year (2016-2017)
Semester	Even
Staff Name	Mr. J. Vijaya Xavier Parthiban
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To facilitate a better understanding of vector space
- To solve problems in matrices

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-VI/ Core - 9

LINEAR ALGEBRA

Unit I Vector Spaces**:** Definition and examples – elementary properties – subspaces – linear transformation – fundamental theorem of homomorphism.

Unit II Span of a set – linear dependence and independence – basis and dimension - theorems

Unit III Rank and nullity Theorem – matrix of a linear transformation. Inner product space **:** Definition and examples – orthogonality – orthogonal complement – Gram Schmidt orthogonalisation process.

Unit IV Matrices: Elementary transformation – inverse – rank – test for consistency – solving linear equations.

Unit V Cayley Hamilton theorem – Applications of Cayley Hamilton theorem – Eigen values and Eigen vectors – Properties and problems.

Text Book:

1. Arumugam & others – Modern Algebra

Books for Reference:

1. Shama.J.N and Vashistha .A.R, “Linear Algebra”, Krishna Prakash Nandir, 1981.
2. John B. Fraleigh, “A First Course in Abstract Algebra”, 7th edition, Pearson, 2002.
3. Strang G., “Introduction to Linear Algebra”, 4th edition, Wellesly Cambridge Press, Wellesly, 2009.
4. Artin M., “Abstract Algebra”, 2nd edition, Pearson, 2011.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03-12-2018
1-L1	Introduction
2-L2	Vector Spaces**:** Definition and examples
3- L3	Vector Spaces**:** Definition and examples
4-L4	Vector Spaces**:** Definition and examples
5-L5	elementary properties
6-L6	elementary properties
7-L7	elementary properties
8-L8	subspaces
9-L9	subspaces
10-P1	**Inauguration of Mathematics Association**
11-L10	subspaces
12-L11	linear transformation
13-L12	linear transformation
14-L13	linear transformation
15-L14	fundamental theorem of homomorphism
16-L15	fundamental theorem of homomorphism
17-L16	fundamental theorem of homomorphism
18-L17	Span of a set
19-L18	Span of a set
20-L19	Span of a set
21-L20	Span of a set
22-L21	linear dependence and independence
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(18-01-2019)
24-L23	linear dependence and independence
25-L24	linear dependence and independence
26-IT-1	**Internal Test-I**
27-L25	linear dependence and independence
28-L26	basis and dimension
29-L27	basis and dimension
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	basis and dimension
32- L30	basis and dimension

33- L31	Theorems
34-P2	**College level meeting/Cell function**
35- L32	theorems
36- L33	theorems
37- L34	Rank and nullity Theorem
38- L35	Rank and nullity Theorem
39- L36	Rank and nullity Theorem
40- L37	matrix of a linear transformation
41- L38	matrix of a linear transformation
42- L39	matrix of a linear transformation
43- L40	Inner product space **:** Definition and examples
44- L41	Inner product space **:** Definition and examples
45- L42	Inner product space **:** Definition and examples
46- L43	orthogonality
47- L44	orthogonality
48- L45	orthogonality
49- L46	orthogonal complement
50- L47	orthogonal complement
51- P3	**Department Seminar**
52- L48	orthogonal complement
53- L49	Gram Schmidt orthogonalisation process
54- L50	Gram Schmidt orthogonalisation process
55- L51	Gram Schmidt orthogonalisation process
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(25-02-2019)
57-L53	Elementary transformation
58-L54	Elementary transformation
59-IT-II	**Internal Test-II**
60- L55	Elementary transformation
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Elementary transformation
63- L58	inverse
64- L59	inverse
65- L60	inverse
66- L61	rank
67- L62	rank
68- L63	rank
69- L64	test for consistency
70- L65	test for consistency
71- L66	solving linear equations
72- L67	solving linear equations
73- L68	Cayley Hamilton theorem
74-P4	**College level meeting/ function**
75- L69	Applications of Cayley Hamilton theorem
76- L70	Applications of Cayley Hamilton theorem
77- L71	Eigen values and Eigen vectors
78- L72	Eigen values and Eigen vectors

79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins (22-03-2019)
80- L74	Eigen values and Eigen vectors
81- L75	Eigen values and Eigen vectors
82-IT-III	**Internal Test-III**
83- L76	Properties and problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Properties and problems
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (08-04-2019)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course "Linear Algebra"
CO1	Enable the students to facilitate a better understanding of vector space.
CO2	Enable the students to solve problems in matrices.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Complex Analysis
Course Code	**JMMA62**
Class	III year (2016-2017)
Semester	Even
Staff Name	Dr. G. Jeyakumar Mrs. C. Henrietta Johnsy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To understand thefunctions of complex variables
- To learn about elementary transformations concepts in complex variables
- To understand the singularity concepts and residues

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-VI/ Core – 10

COMPLEX ANALYSIS

Unit I (Analytic functions) Functions of a complex variable – Derivatives – Cauchy – Riemann equations – sufficient conditions – Polar form – Analytic functions – Harmonic functions.

Unit II (Integrals) Definite integrals – Contours – Cauchy – Goursat theorem – antiderivatives and independence of path – Cauchy Integral formula – Morera's theorem.

Unit III (Series) Taylor's series – Examples – Laurent's series – Zeros of analytic functions – Residues – Residue theorem – Principal part of functions – Residues at poles.

Unit IV (Evaluation of Integrals) Evaluation of improper real integrals – improper integrals involving sines and cosines – Definite integrals involving sines and coines.

Unit V (Transformations) Conformal mappings – basic properties – Bilinear maps – fixed points - Applications

Text Book :
1) Arumugam .S and T. Issac –"Complex Analysis" – Scitech Publishing House – Chennai.

Books for Reference :
1. Churchill .R.V. and J.W. Brown – "Complex variables and Applications" – IV edition – McGraw Hill International Editions.
2. Ponnuswamy .S – "Foundations of Complex Analysis", Narosa Publication House, New Delhi, II edition 2005.
3. Duraipandian .P and Lakshmi Duraipandian – "Complex Analysis" – Emerald Publications, Chennai (2001)
4. Shakarchi .R, Problems and solutions of Complex Analysis. Springer – Verlag, New York 1999.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03.12.2018
1-L1	Introduction
2-L2	Functions of a complex variable
3- L3	Functions of a complex variable
4-L4	Functions of a complex variable
5-L5	Derivatives
6-L6	Derivatives
7-L7	Cauchy
8-L8	Riemann equations
9-L9	Riemann equations
10-P1	**Inauguration of Mathematics Association**
11-L10	sufficient conditions
12-L11	sufficient conditions
13-L12	Polar form
14-L13	Polar form
15-L14	Analytic functions
16-L15	Analytic functions
17-L16	Harmonic functions
18-L17	Harmonic functions
19-L18	Definite integrals
20-L19	Definite integrals
21-L20	Contours
22-L21	Cauchy
23-L22	Problems Discussions- **Allotting portion for Internal Test-I**
	Internal Test I begins(18.01.2019)

24-L23	Goursat theorem
25-L24	Goursat theorem
26-IT-1	**Internal Test-I**
27-L25	antiderivatives and independence of path
28-L26	antiderivatives and independence of path
29-L27	Morera's theorem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Taylor's series
32- L30	Taylor's series
33- L31	Examples
34-P2	**College level meeting/Cell function**
35- L32	Laurent's series
36- L33	Laurent's series
37- L34	Zeros of analytic functions
38- L35	Zeros of analytic functions
39- L36	Zeros of analytic functions
40- L37	Residues
41- L38	Residues
42- L39	Residue theorem
43- L40	Principal part of functions
44- L41	Principal part of functions
45- L42	Principal part of functions
46- L43	Residues at poles
47- L44	Residues at poles
48- L45	Principal part of functions
49- L46	Evaluation of improper real integrals
50- L47	Evaluation of improper real integrals
51- P3	**Department Seminar**
52- L48	Evaluation of improper real integrals
53- L49	improper integrals involving sines and cosines
54- L50	improper integrals involving sines and cosines
55- L51	improper integrals involving sines and cosines
56-L52	Problems Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(25.02.2019)
57-L53	Problems Discussions
58-L54	Problems Discussions
59-IT-II	**Internal Test-II**
60- L55	Definite integrals involving sines and coines
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Definite integrals involving sines and coines
63- L58	Definite integrals involving sines and coines
64- L59	Problems Discussions
65- L60	Problems Discussions
66- L61	Conformal mappings
67- L62	Conformal mappings
68- L63	Conformal mappings

69- L64	basic properties
70- L65	basic properties
71- L66	Bilinear maps
72- L67	Bilinear maps
73- L68	Bilinear maps
74-P4	**College level meeting/ function**
75- L69	fixed points
76- L70	fixed points
77- L71	fixed points
78- L72	Applications
79- L73	Problems Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(22.03.2019)
80- L74	Applications
81- L75	Applications
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (08.04.2019)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Complex Analysis"
CO1	Enable the students to understand the functions of complex variables
CO2	Students will obtain knowledge about elementary transformations, concepts in complex variables.
CO3	Enable the students to understand the singularity concepts and residues.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Number Theory
Course Code	**JMMA63**
Class	III year (2016-2017)
Semester	Even
Staff Name	Mrs.W. Ranjitha Mary Mrs. S. Shyamala Malini
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To highlight the beauties in the world of numbers
- Toprepare the students for coding through congruences

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-VI/ Core -11

NUMBER THEORY

Unit I Peano‟s Axioms – Mathematical Induction – The Binomial Theorem – Early Number Theory.

Unit II Division Algorithm – GCD – Euclidean Algorithm – The Diaphantine Equation ax + by = c.

Unit III The fundamenta Theorem of Arithmetic – The Sieve of Eratosthenes – The Goldbach conjecture.

Unit IV Basis properties of congruences – Linear congruence and the Chinese Remainder Theorem.

Unit V Fermat’s Theorem – Wilson’s Theorem – The Fermat – Kraitchik Factorization Method.

Text Book:
1) David .M. Burton - Elementary Number Theory (Sixth Edition) Tata McGraw Hill Education Pvt. Ltd.

Books for Reference :
1. Ivan Niven and H, Zuckerman - An Introduction to Theory of Numbers.
2. Kumaravelu .S, and SusheelaKumaravelu - Elements Theory - Nagercoil, 2002.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03.12.2018
1-L1	Introduction
2-L2	Peano"s Axioms
3- L3	Peano"s Axioms
4-L4	Mathematical Induction
5-L5	Mathematical Induction
6-L6	Mathematical Induction Problems
7-L7	Mathematical Induction Problems
8-L8	The Binomial Theorem
9-L9	The Binomial Theorem Problems
10-P1	**Inauguration of Mathematics Association**
11-L10	Early Number Theory
12-L11	Early Number Theory
13-L12	Early Number Theory
14-L13	Early Number Theory
15-L14	Division Algorithm
16-L15	Division Algorithm
17-L16	GCD
18-L17	GCD
19-L18	GCD
20-L19	GCD Problems
21-L20	GCD Problems
22-L21	GCD Problems
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(18.01.2019)
24-L23	Euclidean Algorithm
25-L24	Euclidean Algorithm
26-IT-1	**Internal Test-I**
27-L25	The Diaphantine Equation ax + by = c.
28-L26	The Diaphantine Equation ax + by = c.
29-L27	The Diaphantine Equation ax + by = c.
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	The fundamenta Theorem of Arithmetic
32- L30	The fundamenta Theorem of Arithmetic
33- L31	The Sieve of Eratosthenes
34-P2	**College level meeting/Cell function**

35- L32	The Sieve of Eratosthenes
36- L33	The Sieve of Eratosthenes
37- L34	The Sieve of Eratosthenes
38- L35	The Sieve of Eratosthenes
39- L36	The Goldbach conjecture
40- L37	The Goldbach conjecture
41- L38	The Goldbach conjecture
42- L39	The Goldbach conjecture
43- L40	The Goldbach conjecture
44- L41	Basis properties of congruences
45- L42	Basis properties of congruences
46- L43	Basis properties of congruences
47- L44	Basis properties of congruences
48- L45	Linear congruence
49- L46	Linear congruence
50- L47	Linear congruence
51- P3	**Department Seminar**
52- L48	Linear congruence problems
53- L49	Linear congruence Problems
54- L50	Chinese Remainder Theorem
55- L51	Chinese Remainder Theorem
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(25.02.2019)
57-L53	Fermat’s Theorem
58-L54	Fermat’s Theorem
59-IT-II	**Internal Test-II**
60- L55	Fermat’s Theorem Problems and Examples
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Fermat’s Theorem Problems and Examples
63- L58	Fermat’s Theorem Problems and Examples
64- L59	Wilson’s Theorem
65- L60	Wilson’s Theorem
66- L61	Wilson’s Theorem Problems and Examples
67- L62	Wilson’s Theorem Problems and Examples
68- L63	Wilson’s Theorem Problems and Examples
69- L64	The Fermat – Kraitchik Factorization Method
70- L65	The Fermat – Kraitchik Factorization Method
71- L66	The Fermat – Kraitchik Factorization Method
72- L67	The Fermat – Kraitchik Factorization Method Problems and Examples
73- L68	The Fermat – Kraitchik Factorization Method Problems and Examples
74-P4	**College level meeting/ function**
75- L69	Revision
76- L70	Revision
77- L71	Revision
78- L72	Class Test
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(22.03.2019)

80- L74	Class Test
81- L75	Class Test
82-IT-III	**Internal Test-III**
83- L76	Exercise Problem discussions
84- L77	**Test Paper distribution and result analysis**
85- L78	Exercise Problem discussions
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (08.04.2019)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Number Theory"
CO1	Enable the students to highlight the beauties in the world of numbers.
CO2	Students get prepared for coding through congruence.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Trigonometry, Laplace Transforms and Fourier Series
Course Code	**JSMA4A**
Class	II year (2016-2017)
Semester	Even
Staff Name	Dr. A.AlwynAsir
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To understand the concept of Trigonometry
- To know the concept of Laplace transform
- To study the concept of Fourier series

Syllabus

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 TangapandiIssac .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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Introduction
2-L2	Expansions of sin nx, cos nx expansion
3- L3	Expansions of sin nx, cos nx expansion
4-L4	tan nx and expansions of sinnx&cosnx
5-L5	tan nx and expansions of sinnx&cosnx
6-L6	Hyperbolic functions
7-L7	Hyperbolic functions
8- P1	**Inauguration of Mathematics Association**
9- L8	Relations between hyperbolic functions and circular functions
10- L9	Relations between hyperbolic functions and circular functions
11-L10	Inverse hyperbolic functions
12-L11	Inverse hyperbolic functions
13-L12	Logarithm of complex numbers
14-L13	Logarithm of complex numbers
15-L14	Problem discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins(22-01-2018)
16-L15	Logarithm of complex numbers
17-IT-1	**Internal Test-I**
18-L16	Logarithm of complex numbers
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Summation of series by C + iS method
21- L19	Summation of series by C + iS method.
22- P2	**College level meeting/Cell function**
23-L20	Laplace Transforms
24-L21	Laplace Transforms
25-L22	Inverse Laplace Transforms
26-L23	Inverse Laplace Transforms
27-L24	Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms.
28-L25	Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms.

29-L26	Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms.
30-L27	Fourier Series
31-L28	Fourier Series
32-L29	Definition
33-L30	Definition
34- P3	**Department Seminar**
35-L31	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
36-L32	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(26-02-2018)
37- L33	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
38- IT-II	**Internal Test-II**
39-L34	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Odd and even functions
42- L37	Odd and even functions
43- L38	Odd and even functions
44- P4	**College level meeting/ function**
45-L39	Half range series
46-L40	Half range series
47-L41	Half range series
48-L42	Revesion
49-L43	Revesion
50-L44	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(01-04-2018)
51 L45	Problem Discussion
52- L46	Problem Discussion
53-IT-III	**Internal Test-III**
54-L47	Revesion
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test (12-04-2018)**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course "Trigonometry, Laplace Transforms and Fourier Series"
CO1	Enable the students to understand the concept of Trigonometry.
CO2	Gaining knowledge on the concept of Laplace transform.
CO3	Learners will know about the concept of Fourier series.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Combinatorial Mathematics
Course Code	**JMMA5D**
Class	III year (2016-2017)
Semester	Odd
Staff Name	Dr. Mrs. G.S. Grace Prema
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To know the basic concepts of Pairings
- To understand relations
- To study the concepts of designs

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-V/
Major Elective – II (A)

Combinatorial Mathematics

Unit I Selections and Binomial coefficients – Permutations – Ordered Selections – Unordered Selections – Miscellaneous Problems.

Unit II Pairings Problems - Pairings within a set – Pairings between sets – An optional assignment problem.

Unit III Recurrence – Fibonacci – type relations. Using generating functions – Miscellaneous methods.

Unit IV The inclusion – Exclusion Principles – The Principle – Rook Polynomials
Unit V Block designs – Square Block designs

Text Books :
1. Ian Andersen – A first course in combinatorial Mathematics – Clarendon Press, Oxford.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-06-2018
1-L1	Introduction
2-L2	Selections and Binomial coefficients
3- L3	Selections and Binomial coefficients
4-L4	Selections and Binomial coefficients
5-L5	Permutations
6-L6	Permutations
7-L7	Permutations
8-L8	Ordered Selections
9-L9	Ordered Selections
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Ordered Selections
12-L11	Unordered Selections
13-L12	Unordered Selections
14-L13	Unordered Selections
15-L14	Miscellaneous Problems
16-L15	Miscellaneous Problems
17-L16	Miscellaneous Problems
18-L17	Pairings Problems
19-L18	Pairings Problems
20-L19	Pairings Problems
21-L20	Pairings Problems
22-L21	Pairings within a set
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins (30-07-2018)
24-L23	Pairings within a set
25-L24	Pairings within a set
26-IT-1	**Internal Test-I**
27-L25	Pairings within a set
28-L26	Pairings between sets
29-L27	Pairings between sets
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Pairings between sets
32- L30	Pairings between sets
33- L31	An optional assignment problem.
34-P2	**College level meeting/Cell function**
35- L32	An optional assignment problem
36- L33	An optional assignment problem
37- L34	An optional assignment problem
38- L35	Recurrence
39- L36	Recurrence
40- L37	Recurrence
41- L38	Recurrence

42- L39	Fibonacci
43- L40	Fibonacci
44- L41	Fibonacci
45- L42	type relations
46- L43	type relations
47- L44	type relations
48- L45	Using generating functions
49- L46	Using generating functions
50- L47	Using generating functions
51- P3	**Department Seminar**
52- L48	Miscellaneous methods
53- L49	Miscellaneous methods
54- L50	Miscellaneous methods
55- L51	Miscellaneous methods
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(03-09-2018)
57-L53	The inclusion
58-L54	The inclusion
59-IT-II	**Internal Test-II**
60- L55	The inclusion
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	The inclusion
63- L58	Exclusion Principles
64- L59	Exclusion Principles
65- L60	Exclusion Principles
66- L61	Exclusion Principles
67- L62	The Principle
68- L63	The Principle
69- L64	The Principle
70- L65	The Principle
71- L66	Rook Polynomials
72- L67	Rook Polynomials
73- L68	Rook Polynomials
74-P4	**College level meeting/ function**
75- L69	Block designs
76- L70	Block designs
77- L71	Block designs
78- L72	Block designs
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(08-10-2018)
80- L74	Square Block designs
81- L75	Square Block designs
82-IT-III	**Internal Test-III**
83- L76	Square Block designs
84- L77	**Test Paper distribution and result analysis**
85- L78	Square Block designs
	Entering Internal Test-III Marks into University portal

86-MT	**Model Test (22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-10-2018

Course Outcomes

Learning Outcomes	**COs** of the course "Combinatorial Mathematics"
CO1	Acquisition of knowledge on the basic concepts of Pairings and arrangements etc.
CO2	Enable the students to understand aspects of assignment problems.
CO3	Students will be able to understand the concepts of block designs.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc. Mathematics
Course Name	Calculus
Course Code	**JMMA11**
Class	I year (2016-2017)
Semester	Odd
Staff Name	Dr(Mrs) J.SureshSuseela, Mrs. T.Santhakumari
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To define the curvature and its radius and discuss its properties in both cartesian and polar coordinate systems
- Define curve, graph, involute and evolute and solve related problems
- Study the curve tracing techniques on graphs and discuss some properties graphically
- Discuss the concepts of asymptotes, especially the asymptotes parallel to axes and inclined lines
- To examine various techniques of integration and apply them to definite and improper integrals
- To study about special integral functions, called beta and gamma functions

Syllabus

CALCULUS

Unit I Radius of Curvature in Cartesian and polar Co-ordinates, Pedal Equation - Involute and evolute - chord of curvature

Unit II Asymptotes - singular points (Node, cusp, Conjugate Points)

Unit III Tracing of curves - Folium of Descarte’s - Cycloid, Cardioid and Lemniscate of Bernoulli

Unit IV Properties of Definite Integral - Bernoulli's formula and Reduction Formulae -

Double and Triple Integrals - Changing the order of integration - Jacobians and change of variables

Unit V Beta and Gamma functions - Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals, Improper Integrals.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2016
1-L1	Introduction
2-L2	Introduction
3- L3	Radius of Curvature in Cartesian and polar Co-ordinates
4-L4	Radius of Curvature in Cartesian and polar Co-ordinates
5-L5	Radius of Curvature in Cartesian and polar Co-ordinates
6-L6	Pedal Equation
7-L7	Pedal Equation
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Pedal Equation
10- L9	Involute and evolute
11-L10	Involute and evolute
12-L11	Involute and evolute
13-L12	chord of curvature
14-L13	chord of curvature
15-L14	chord of curvature
16-L15	chord of curvature
17- L16	Asymptotes
18- L17	Asymptotes
19- L18	Asymptotes
20- L19	singular points (Node, cusp, Conjugate Points)
21- L20	Problem Discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins(25.07.2016)
22- L21	singular points (Node, cusp, Conjugate Points)
23- IT-1	**Internal Test-I**
24- L22	singular points (Node, cusp, Conjugate Points)
25- L23	singular points (Node, cusp, Conjugate Points)
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Tracing of curves
28- L26	Tracing of curves
29- L27	Tracing of curves
30- P2	**College level meeting/Cell function**
31-L28	Folium of Descarte's
32-L29	Folium of Descarte's
33-L30	Folium of Descarte's
34- L31	Cycloid, Cardioid and LemniscateofBernoulli
35- L32	Cycloid, Cardioid and LemniscateofBernoulli
36- L33	Cycloid, Cardioid and LemniscateofBernoulli

37- L34	Cycloid, Cardioid and LemniscateofBernoulli
38- L35	Properties of Definite Integral
39- L36	Properties of Definite Integral
40- L37	Properties of Definite Integral
41- L38	Properties of Definite Integral
42-P3	**Department Seminar**
43- L39	Bernoulli's formula and Reduction Formulae
44- L40	Bernoulli's formula and Reduction Formulae
45- L41	Bernoulli's formula and Reduction Formulae
46- L42	Double and Triple Integrals
47- L43	Problem Discussion - **Allotting portion for Internal Test-II**
	Internal Test II begins(22.08.2016)
48- L44	Double and Triple Integrals
49-IT-II	**Internal Test-II**
50-L45	Double and Triple Integrals
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Changing the order of integration
53- L48	Changing the order of integration
54- L49	Changing the order of integration
55- L50	Jacobians and change of variables
56- L51	Jacobians and change of variables
57- L52	Jacobians and change of variables
58- L53	Beta and Gamma functions
59-P4	**College level meeting/ function**
60- L54	Beta and Gamma functions
61- L55	Beta and Gamma functions
62- L56	Application of Beta and Gamma Functions inevaluation of Double and Triple Integrals
63- L57	Application of Beta and Gamma Functions inevaluation of Double and Triple Integrals
64- L58	Problem Discussion - **Allotting portion for Internal Test-III**
	Internal Test III begins(03.10.2016)
65- L59	Application of Beta and Gamma Functions inevaluation of Double and Triple Integrals
66- L60	Improper Integrals
67-IT-III	**Internal Test-III**
68- L61	Application of Beta and Gamma Functions inevaluation of Double and Triple Integrals
69- L62	Application of Beta and Gamma Functions inevaluation of Double and Triple Integrals
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (17.10.2016)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**

75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30.11.2016

Course Outcomes

Learning Outcomes	**COs** of the course “Calculus”
CO1	Enable the students to learn and gain knowledge about curvatures, integrations and its geometrical applications.
CO2	On successful completion of course the students should have gained about the evolutes and envelopes, different types of integrations, its geometrical application, single and multiple integration

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Real Analysis I
Course Code	**JMMA31**
Class	II year (2016-2017)
Semester	Odd
Staff Name	Mrs.S.Vijila Velvet Daisy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Learn to work with logarithmic, exponential, and inverse trigonometric functions.
- Learn to work with infinite sequences and series.
- Learn to work with infinite sequence is bounded.
- Learn to work with an infinite sequence is monotonic.
- Learn to work with an infinite sequence is convergent or divergent.
- Find the sequence of partial sums of an infinite series.

Syllabus

MSU/2016-17/UG-Colleges /Part-III (B.Sc. Mathematics)/ Semester-III/ Ppr.no.15/ Core-5

REAL ANALYSIS - I

Unit I 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 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 Infinite series – nth term test – Comparison test – Kummer‟s test – D‟Alemberls ratio test – Raabe‟s test - Gauss test – Root test – Canchy‟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 – Maclaurins series.

Text Books:
1) Arumugam .S and ThengapandiIssac – “sequences and series”, New Gamma publishing House, Palayamkottai – 627 002.
2) 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

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2017
1-L1	Introduction
2-L2	The field of axioms, the order axioms, the rational numbers.
3- L3	The field of axioms, the order axioms, the rational numbers.
4-L4	the irrational numbers, upper bounds, maximum element, least upper bound (supremum)
5-L5	the irrational numbers, upper bounds, maximum element, least upper bound (supremum)
6-L6	The completeness axiom, absolute values, the triangle inequality.
7-L7	The completeness axiom, absolute values, the triangle inequality.
8-L8	Cauchy – schwartz‟s inequality.
9-L9	Cauchy – schwartz‟s inequality.
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Bounded sequences
12-L11	Bounded sequences
13-L12	monotonic sequences
14-L13	monotonic sequences
15-L14	convergent sequences
16-L15	convergent sequences
17-L16	convergent sequences
18-L17	divergent and oscillating sequences
19-L18	divergent and oscillating sequences
20-L19	divergent and oscillating sequences
21-L20	The algebra of limits.
22-L21	The algebra of limits.
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(31.07.2017)
24-L23	Behaviour of monotonic sequences
25-L24	Behaviour of monotonic sequences
26-IT-1	**Internal Test-I**
27-L25	Cauchy‟s first limit theorem
28-L26	Cauchy‟s first limit theorem
29-L27	Cauchy‟s first limit theorem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Cauchy‟s second limit theorem

32- L30	Cauchy"s second limit theorem
33- L31	Cesaro"s theorem
34-P2	**College level meeting/Cell function**
35- L32	Cesaro"s theorem
36- L33	subsequences
37- L34	subsequences
38- L35	Cauchy sequence
39- L36	Cauchy sequence
40- L37	Cauchy"s general principle of convergence.
41- L38	Cauchy"s general principle of convergence.
42- L39	Cauchy"s general principle of convergence.
43- L40	Infinite series
44- L41	Infinite series
45- L42	nth term test
46- L43	Comparison test
47- L44	Comparison test
48- L45	Kummer"s test
49- L46	Kummer"s test
50- L47	Kummer"s test
51- P3	**Department Seminar**
52- L48	D"Alemberls ratio test
53- L49	D"Alemberls ratio test
54- L50	Raabe"s test
55- L51	Raabe"s test
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(30.08.2017)
57-L53	Gauss test
58-L54	Root test
59-IT-II	**Internal Test-II**
60- L55	Canchy"s condensation test (without proof)
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Alternating series
63- L58	Alternating series
64- L59	Leibnitz"s test
65- L60	Leibnitz"s test
66- L61	Leibnitz"s test
67- L62	Tests for convergence of series of arbitrary terms
68- L63	Tests for convergence of series of arbitrary terms
69- L64	Tests for convergence of series of arbitrary terms
70- L65	Power series
71- L66	Power series
72- L67	Taylor"s series
73- L68	Taylor"s series
74-P4	**College level meeting/ function**
75- L69	Maclaurins series.
76- L70	Maclaurins series.
77- L71	Maclaurins series.

78- L72	Class Test
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(03.10.2017)
80- L74	Revision
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (19.10.2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Real Analysis I"
CO1	Enable the students with a good foundation of classical analysis.
CO2	Learners will obtain the knowledge on behaviour of sequences and series.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Real Analysis II
Course Code	**JMMA51**
Class	III year (2016-2017)
Semester	Odd
Staff Name	Mrs.W.Ranjitha Mary
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To understand the real number of system and metric spaces.
- To know the concepts of continuity and Riemann integrals
- To study the concept of connectedness and compactness

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-V/ Core - 7

REAL ANALYSIS – II

Unit I Metric spaces – Examples – bounded sets – open ball – open sets – subspaces – Interior of a set.

Unit II Closed sets – closure – Limit points – Dense sets – complete metric space – Cantor's intersection theorem – Baire's Category Theorem.

Unit III Continuous functions on metric spaces : Functions - continuous at a point on the real line – Functions - Continuous – uniform continuous in a metric space – Discontinuous function or R1.

Unit IV Connectedness and compactness : Connectedness – connected subset of R – connectedness and continuity – compact metric spaces – compact subset of R^1 – Heine Borel theorem.

Unit V Riemann Integral : Sets of measure zero – Existence of the Riemann integral – Derivatives – Rolle's theorem – Fundamental theorem of Calculus – Mean value theorem – Cauchy's mean value theorem – Taylor's theorem.

Text Books:

1)Arumugam & Others – Modern Analysis

2) Malic .S.C – Mathematical Analysis, Wiley Eastern Limited, New Delhi.

Books for Reference :

1. Tom .M. Apostal – Mathematical Analysis, II Edition, Narosa Publishing House, New Delhi (Unit I) (1997)
2. Goldberg .R – Methods of Real Analysis Oxford and IBH Publishing Co. New Delhi (200)
3. Viswanath Naik .K – Real Analysis, Emerald Publishers, Chennai.
4. Malic .S.C and Savitha Arora (1991) - Mathematical Analysis, Wiley Eastern Limited, New Delhi.
5. Berberian .S.K – First course in Real Analysis, Springer Verlag, New York.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-06-2018
1-L1	Introduction
2-L2	Metric spaces
3- L3	Metric spaces
4-L4	Metric spaces
5-L5	Examples
6-L6	Examples
7-L7	bounded sets
8-L8	bounded sets
9-L9	open ball
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	open sets
12-L11	open sets
13-L12	subspaces
14-L13	subspaces
15-L14	Interior of a set
16-L15	Interior of a set
17-L16	Closed sets
18-L17	Closed sets
19-L18	closure
20-L19	closure
21-L20	Limit points
22-L21	Limit points
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(30-07-2018)
24-L23	Dense sets
25-L24	Dense sets

26-IT-1	**Internal Test-I**
27-L25	complete metric space
28-L26	complete metric space
29-L27	Cantor's intersection theorem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Baire's Category Theorem
32- L30	Continuous functions on metric spaces
33- L31	Continuous functions on metric spaces
34-P2	**College level meeting/Cell function**
35- L32	continuous at a point on the real line
36- L33	continuous at a point on the real line
37- L34	Functions
38- L35	Continuous
39- L36	uniform continuous in a metric space
40- L37	uniform continuous in a metric space
41- L38	connected subset of R
42- L39	connected subset of R
43- L40	connectedness and continuity
44- L41	connectedness and continuity
45- L42	Discontinuous function or R^1
46- L43	Discontinuous function or R^1
47- L44	Connectedness and compactness
48- L45	Connectedness and compactness
49- L46	connected subset of R
50- L47	connected subset of R
51- P3	**Department Seminar**
52- L48	connectedness and continuity
53- L49	connectedness and continuity
54- L50	connectedness and continuity
55- L51	compact metric spaces
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(03-09-2018)
57-L53	compact metric spaces
58-L54	compact metric spaces
59-IT-II	**Internal Test-II**
60- L55	compact subset of R1
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	compact subset of R1
63- L58	Heine Borel theorem
64- L59	Sets of measure zero
65- L60	Sets of measure zero
66- L61	Existence of the Riemann integral
67- L62	Existence of the Riemann integral
68- L63	Derivatives
69- L64	Derivatives
70- L65	Rolle's theorem

71- L66	Rolle's theorem
72- L67	Fundamental theorem of Calculus
73- L68	Fundamental theorem of Calculus
74-P4	**College level meeting/ function**
75- L69	Mean value theorem
76- L70	Mean value theorem
77- L71	Cauchy's mean value theorem
78- L72	Cauchy's mean value theorem
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(08-10-2018)
80- L74	Taylor's theorem
81- L75	Taylor's theorem
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-10-2018

Course Outcomes

Learning Outcomes	**COs** of the course "Real Analysis II"
CO1	Students can understand the real number of system and metric spaces.
CO2	Students will know the concepts of continuity and Riemann integrals.
CO3	Enable the students to understand the concept of connectedness and compactness.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Combinatorial Mathematics
Course Code	**GMMA5B**
Class	III year(2016 – 2017)
Semester	Odd
Staff Name	G.S.GRACE PREMA
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives .

- Combinatorics is a branch of mathematics concerning the study of finite or countable discrete structures.
- Aspects of combinatorics include counting the structures of a given kind and size (enumerative combinatorics), deciding when certain criteria can be met, and constructing and analyzing objects meeting the criteria.
- Many combinatorial questions have historically been considered in isolation, giving an adhoc solution to a problem arising in some mathematical context. In the later twentieth century, however, powerful and general theoretical methods were developed, making combinatorics into an independent branch of mathematics in its own right.
- Combinatorics is used frequently in computer science to obtain formulas and estimates in the analysis of algorithms

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2016
1-L1	Unit-1 Introduction
2-L2	Definition for colourings and examples
3- L3	Theorem for colouring
4-L4	Recurrence relation- definitions, examples and problems
5-L5	Permutation-Definition, Theorems
6-L6	Permutation related problems
7-L7	Definition for p(n,r) and problems
8-L8	Combination definition
9-L9	Combination related theorems and problems
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Pascal’s identity theorem
12-L11	Problems for Binomial theorem
13-L12	Exponential-Definition and theorem
14-L13	Problems on permutation
15-L14	Exercise problems of permutation
16-L15	Unit-2 Pairings definitions and examples
17-L16	Definition- vertices, edges, graph and example
18-L17	Perfect matching definitions
19-L18	Perfect matching examples
20-L19	Perfect matching Theorem
21-L20	Pairing between sets
22-L21	Hall’s theorem on distinct representation or Assignment of Marriage theorem
23-L22	Latin square-Definitions and examples- **Allotting portion for Internal Test-I**
	Internal Test I begins (25-07-2016)
24-L23	Problems on Latin squares
25-L24	Latin rectangle-Definitions and examples
26-IT-1	**Internal Test-I**
27-L25	Hungarian Algorithm for solving assignment

28-L26	Assignment problems
29-L27	Balanced Assignment problems
30-L28	Unbalanced Assignment problems **-Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Unbalanced Assignment problems
32- L30	Travelling salesman problem
33- L31	Travelling salesman problems
34-P2	**College level meeting/Cell function**
35- L32	Unit-3 Recurrence relation- Definition and examples
36- L33	Solving the recurrence relation
37- L34	Problems on recurrence relation
38- L35	Problems on recurrence relation
39- L36	Problems on recurrence relation
40- L37	Derivation of Fibonacci relation
41- L38	The problems of derangements-Definitions and problems
42- L39	Another formulation for derangement
43- L40	Partition of an integer, tree-Definitions and examples
44- L41	Degree of vertex, simple tree, rooted simple tree-definitions and examples
45- L42	Rooted simple tree's problems
46- L43	The generating function for rooted simple tree
47- L44	Problems on generating function for rooted simple tree
48- L45	Possible number of colouring problems
49- L46	Unit-4 The inclusion- exclusion principle
50- L47	Theorem for $\lvert A\cup B\cup c\rvert$ and $\lvert A\cup B\cup C\cup D\rvert$
51- P3	**Department Seminar**
52- L48	Problems on inclusion –exclusion principle
53- L49	Problems on inclusion-exclusion principle
54- L50	Rook Polynomial-definition
55- L51	Rook polynomial problems
56-L52	Rook polynomial problems- **Allotting portion for Internal Test-II**
	Internal Test II begins(22-08-2016)
57-L53	Rook polynomial for 4x4 board and 8x8 board
58-L54	Non-interfering definitions and theorem
59-IT-II	**Internal Test-II**
60- L55	Another theorem of non-interfering
61- L56	Rook polynomial problems- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems on Rook polynomial
63- L58	Rook polynomial for 6x6 Latin square
64- L59	Rook polynomial for5x5 Latin square
65- L60	Problems on Rook polynomial
66- L61	Problems on Rook polynomial
67- L62	problems on Rook polynomial
68- L63	Unit-5 Block designs, Block -definition
69- L64	Matrix representation for Block designs
70- L65	Properties of the incident matrix
71- L66	Incident matrix problem

72- L67	Incident matrix problem
73- L68	Block design related theorem
74-P4	**College level meeting/ function**
75- L69	Properties of 7 point plane
76- L70	Incident matrix problem
77- L71	Fisher’s theorem
78- L72	Note for incidence matrix
79- L73	Square Block design –Definition, properties and theorem - **Allotting portion for Internal Test-III**
	Internal Test III begins (03-10-2016)
80- L74	Theorem for square block design
81- L75	Finite projective plane definition and notes
82-IT-III	**Internal Test-III**
83- L76	Properties of finite projective plane
84- L77	Finite projective place related lemmas and theorem - **Test Paper distribution and result analysis**
85- L78	Hadamard matrix- definitions and examples
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (17-10-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course Combinatorial Mathematics
CO1	Demonstrate effectively the addition and multiplication principles and use it for counting.
CO2	Use generating functions and the concept of partition to solve combinatorial problems.
CO3	Model recurrence relations using different techniques for real time counting problems and find solutions.
CO4	Outline special counting numbers such as Fibonacci number, Stirling numbers, catalan number and Menage number.
CO5	Design a new counting principle called inclusion and exclusion principle and use it for counting problems.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	CODING THEORY
Course Code	**GMMA5E**
Class	III year(2016-2017)
Semester	Odd
Staff Name	T Stalin Alexis
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Learners get introduced to coding and decoding concepts.
- Train the students in the field of coding theory.

Syllabus

Text: Coding Theory , the essentials-(marcalDekkar, 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 wordtransmitted.

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-Equvalent 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 extenedGolay code-Golaycode..

Unit 5: Polynomials and Words-Introduction to cyclic codes-Polynomial encoding and decoding-Finding cyclic codes-Dual Cyclic Codes.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2016
1-L1	Unit-1 Coding theory Introduction, word
2-L2	List all the words of lengths and examples
3- L3	Basic assumption about the channel
4-L4	Correcting and deleting error batterns
5-L5	Problem 1,2,3,4,5,6 in correcting and detecting error batterns
6-L6	Information rate
7-L7	Finding the most likely codeword transmitted and problems
8-L8	Theorem
9-L9	Some basic Algebra and examples and problems in basic algebra
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Weight and Distance (Add some distance problems)
12-L11	Maximum likelihood Decoding
13-L12	Reliability of Maximum Likelihood Decoding
14-L13	Error detecting codes
15-L14	Distance of the codes
16-L15	Unit-2 Linear codes
17-L16	Exercise problems in linear codes
18-L17	Two important subspaces- Linear scalar product (or) Dot product
19-L18	Orthogonal vector. Orthogonal to the set
20-L19	Linear Independence, example problems
21-L20	Basic examples and exercise
22-L21	Dimension –examples and exercise
23-L22	Matrices and exercises problems- **Allotting portion for Internal Test-I**
	Internal Test I begins (25-07-2016)
24-L23	Elementary Row operation Leading one and leading column
25-L24	Row Echelon form (REF), Reduced Row Echelon form (PREF)
26-IT-1	**Internal Test-I**
27-L25	Bases for c= $< s >$ and c⊥ $examplesandexercise$
28-L26	Algorithm and examples and exercise problems
29-L27	Algorithm for finding the basis
30-L28	Generating Matrices-Example and exercise problems- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Encoding and exercise
32- L30	Unit-3 parity – check Matrices
33- L31	Theorem 2.7.1
34-P2	**College level meeting/Cell function**
35- L32	Theorems on parity
36- L33	Exercise problems in parity check matrices
37- L34	Exercise problems in parity check matrices
38- L35	Equivalent codes
39- L36	Theorem any linear code c is a equivalent to a linear code C having a generator matrix in standard form

40- L37	Examples and exercise problems
41- L38	Exercise problems in equivalent codes
42- L39	Distance of a linear code
43- L40	Examples and exercise problems
44- L41	Examples and exercise problems
45- L42	Distance of a linear code exercise problems
46- L43	Cosets
47- L44	Example and exercise problems
48- L45	Theorem and Exercise problems
49- L46	Exercise problems in cosaets of the linear code
50- L47	Exercise problems in cosets of a linear code
51- P3	**Department Seminar**
52- L48	Exercise problems in cosets of a linear code
53- L49	Minimal likelihood decoding for linear codes
54- L50	Exercise problems in linear codes
55- L51	Reliability of linear codes
56-L52	Syndrome of the word - **Allotting portion for Internal Test-II**
	Internal Test II begins (22-08-2016)
57-L53	Syndrome decoding array and exercise problems
58-L54	Unit-4 Perfect and related codes
59-IT-II	**Internal Test-II**
60- L55	some bounds forcodeas, hamming
61- L56	Maximum distance separable -**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorem on maximum distance separable
63- L58	Theorems on maximum distance separable
64- L59	Corollary and the theorems
65- L60	Exercise problems in maximum distance separable
66- L61	Theorem Gilbert –varshamov bound
67- L62	Corollary of that theorem
68- L63	Exercise problems in maximum distance separable
69- L64	Perfect codes
70- L65	Hamming codes, extended code
71- L66	Parity check matrix for extended code
72- L67	Weight of the word in the extended code
73- L68	Distance of the extended code
74-P4	**College level meeting/ function**
75- L69	The extended Golay code
76- L70	Unit-5 cyclic linear code
77- L71	Algorithm and division algorithm
78- L72	Exercise problems in division algorithm
79- L73	Polynomial encoding and decoding**Allotting portion for Internal Test-III**
	Internal Test III begins (03-10-2016)
80- L74	Algorithm for decoding linear cyclic decoding
81- L75	Finding cyclic codes
82-IT-III	**Internal Test-III**
83- L76	Another method for linear cyclic codes
84- L77	Exercise problems in linear cyclic codes - **Test Paper distribution and**

	result analysis
85- L78	Dual cyclic codes
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (17-10-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course Coding theory
CO1	Acquire basic knowledge of coding.
CO2	Enable the students to understand the functions of linear cyclic codes
CO3	Students get prepared for coding through congruence.
CO4	Acquisition of knowledge on the techniques of division algorithm in coding theory

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Sequences, Series and Trigonometry
Course Code	**GMMA21**
Class	II year (2016-2017)
Semester	Odd
Staff Name	S Vijila Velvet Daisy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Gaining knowledge on series.
- Gaining knowledge on Trignomentry.

Syllabus

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 ofseries-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+ method-Gregory's series.
(Text-2 Chapter IV(full), Chapter V-Section 5, Chapter VI-Section 3)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2016
1-L1	UNIT-I Sequences and its examples
2-L2	Bounded Sequences
3- L3	Monotonic Sequences
4-L4	Convergent Sequences and theorem
5-L5	Examples and theorem on convergent Sequences
6-L6	Divergent and oscillating Sequences
7-L7	Theorems and examples on Divergent
8-L8	The algebra of limits
9-L9	Theorem and corollary on Monotonic
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Theorem 15,16,17
12-L11	Theorem 18,19
13-L12	Theorem 20,21
14-L13	Results on Algebra of limits
15-L14	Theorem and example
16-L15	Problems on algebra of limits
17-L16	Problems on algebra of limits
18-L17	UNIT-II Behaviour of Monotonic sequence
19-L18	Problems on Monotonic sequence
20-L19	Problems on Monotonic sequence
21-L20	Cauchy's 1^{st} limit theorem
22-L21	Cauchy's theorem
23-L22	Cauchy's 2^{nd} limit theorem - **Allotting portion for Internal Test-I**
	Internal Test I begins (25.07.2016)
24-L23	Problems on limit theorem
25-L24	Problems on limit theorem
26-IT-1	**Internal Test-I**
27-L25	Subsequence's
28-L26	Peak point definition and theorem
29-L27	Limit point
30-L28	Cauchy's Sequences - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Cauchy's general principle of convergence
32- L30	Examples on limit point
33- L31	Theorem on limit point
34-P2	**College level meeting/Cell function**

35- L32	UNIT-III Series of positive terms definition and theorem
36- L33	Examples and Note on series
37- L34	Cauchy’s general principle of convergence
38- L35	Comparison test
39- L36	Theorem on Comparison test
40- L37	Problems on Comparison test
41- L38	Problems on Comparison test
42- L39	Kummer’s test
43- L40	D’Alembert’s ratio test
44- L41	Raabe’s test
45- L42	Demorgan and Bertand’s test
46- L43	Gauss test
47- L44	Problems on Gauss test
48- L45	Problems on Raabe’s test
49- L46	Cauchy’s root test
50- L47	Cauchy’s condensation test
51- P3	**Department Seminar**
52- L48	UNIT-IV Alternating series
53- L49	Leibnitz test
54- L50	Problems on Leibnitz test
55- L51	Problems on Leibnitz test
56-L52	Absolute convergence - **Allotting portion for Internal Test-II**
	Internal Test II begins (22-08-2016)
57-L53	Conditionally convergence
58-L54	Theorem and Problems on Absolute convergence -
59-IT-II	**Internal Test-II**
60- L55	Problems on conditionally convergence
61- L56	Multiplication of series - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Examples and Note
63- L58	Abel’s Theorem
64- L59	Theorem on Absolute convergence
65- L60	Problems on Absolute convergence
66- L61	Marten’s Theorem
67- L62	Theorems on Absolute convergence
68- L63	Problems on Mertens
69- L64	UNIT-V Hyperbolic function
70- L65	Results on Hyperbolic function
71- L66	Hyperbolic function definition and notes
72- L67	Relation between Hyperbolic function
73- L68	Problems on Hyperbolic function
74-P4	**College level meeting/ function**
75- L69	Hyperbolic function corresponding to relation between circular function
76- L70	Problems on Hyperbolic function
77- L71	Inverse hyperbolic function
78- L72	Problems on Inverse hyperbolic function
79- L73	Problems on Inverse hyperbolic function - **Allotting portion for Internal Test-III**

	Internal Test III begins (03-10-2016)
80- L74	Logarithms and complex quantities
81- L75	General value of logarithm of (x+iy)
82-IT-III	**Internal Test-III**
83- L76	Problems on Logarithms
84- L77	Summation of series - **Test Paper distribution and result analysis**
85- L78	Summation of series
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 17-10-2016**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Sequences, Series and Trigonometry"
CO1	acquire the knowledge of various inequalities and their applications
CO2	have in-depth knowledge of various types of sequences
CO3	learn sub-sequences and also finding the limits of sequences
CO4	deepen the knowledge of infinite series and various tests for finding the behaviour of series
CO5	apply these concepts in other fields of mathematics

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	LINEAR ALGEBRA
Course Code	**GMMA51**
Class	III year (2016-2017)
Semester	Odd
Staff Name	J VIJAYA XAVIER PARITHIPAN
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Linear algebra is a branch of mathematics that studies systems of linear equations and the properties of matrices.
- The concepts of linear algebra are extremely useful in physics, economics and social sciences, natural sciences, and engineering.
- To understand the axiomatic structure of a modern mathematical subject and learn to construct simple proofs.
- To solve problems those apply Linear Algebra to Chemistry, Economics and Engineering.

Syllabus

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))

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2016
1-L1	Unit-I Introduction
2-L2	Definitions and Examples
3- L3	Scalars, vectors, scalars multiple
4-L4	Notes and Remarks
5-L5	Theorems on vectorspace
6-L6	Subspaces
7-L7	Theorems on supspaces
8-L8	Solved problems and examples
9-L9	Theorems using operations
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Linear transformation
12-L11	Definitions about Homomorphism, Epimorphism and Kernel
13-L12	Fundamental theorem of homomorphism
14-L13	Theorems on vector spaces
15-L14	Span of a set
16-L15	Linear combination, linear span
17-L16	Theorems and examples
18-L17	Unit-II Linear independence
19-L18	Finite dimensional
20-L19	Finite dimensional and its theorems
21-L20	Examples on finite dimensional
22-L21	Linearly independence and dependent
23-L22	Exercises problem - **Allotting portion for Internal Test-I**
	Internal Test I begins(25-07-2016)
24-L23	Note and examples
25-L24	Theorems – any subset of a linearly independent set is linearly independent
26-IT-1	**Internal Test-I**
27-L25	Theorems and examples
28-L26	Basis
29-L27	Theorems on basis
30-L28	Exercise problem - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Theorems and examples
32- L30	Any two bases of finite dimensional vector space V have the same numbers of elements
33- L31	Dimensional
34-P2	**College level meeting/Cell function**
35- L32	Maximal linear independent set
36- L33	Unit-III Rank and nullity

37- L34	Theorems and examples
38- L35	Singular and non-singular
39- L36	Exercise problems on rank
40- L37	Some solved problems on
41- L38	Matrix of a linear transformation
42- L39	Note on matrix
43- L40	Solved problems on Rank of matrix
44- L41	Definition and theorems
45- L42	Exercise problems on matrix
46- L43	Rank of matrix
47- L44	Solved problems
48- L45	Characteristic matrix
49- L46	Theorems and examples on Rank of matrix
50- L47	Theorems and corollary on Rank of matrix
51- P3	**Department Seminar**
52- L48	Solved problems on Characteristic matrix
53- L49	Unit-IV Characteristis equation and cayley Hamilton theorem
54- L50	Matrix polynomial
55- L51	Definitions and examples
56-L52	Cayley Hamilton theorem - **Allotting portion for Internal Test-II**
	Internal Test II begins(22-08-2016)
57-L53	Note and solved problems on Cayley Hamilton theorem
58-L54	Problems using Cayley Hamilton theorem
59-IT-II	**Internal Test-II**
60- L55	Exercise problem on Cayley Hamilton theorem
61- L56	Eigenvalues ,Eigen vectors - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Characteristic roots and properties of Eigen values
63- L58	Results on Eigen values
64- L59	Corollary of Eigen values
65- L60	Solved problems on Eigen values
66- L61	Solved problems on Eigen values
67- L62	Problems to find Eigenvalues
68- L63	Problems to find Eigenvalues
69- L64	Solved problems on Eigenvalue
70- L65	Unit-V Inner product spaces
71- L66	Eucildean space
72- L67	Some notes on Eucildean space
73- L68	Theorems and examples on Eucildean space
74-P4	**College level meeting/ function**
75- L69	Norm, unit vector-definition
76- L70	Solved problems on Norm
77- L71	Theorems using norm
78- L72	Orthogonal
79- L73	Some notes and definitions - **Allotting portion for Internal Test-III**
	Internal Test III begins(03-10-2016)
80- L74	Theorems using orthogonal set
81- L75	Gram –Schmidt Orthogonalisation

82-IT-III	**Internal Test-III**
83- L76	Solved problems on orthogonal set
84- L77	Orthogonal complement - **Test Paper distribution and result analysis**
85- L78	Corollary and solved problems on Orthogonal complement
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (17-10-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course linear Algebra
CO1	Enable the students to learn about the convergence and divergence of the series.
CO2	find the roots for the different types of the equations
CO3	On successful completion of this course the students should have gained knowledge about the convergence of series and solving equations.
CO4	know the fundamentals of vector space
CO5	Understand basis and dimension of a vector space.
CO6	Determine Eigen values and Eigen vectors.
CO7	Get interest in pure mathematics.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature　　　　　　　　　　　　　　　　　　　　　Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B Sc Mathematics
Course Name	Real Analysis
Course Code	**GMMA52**
Class	III year(2016-2017)
Semester	Odd
Staff Name	S Vijila Velvet Daisy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The course deals with metric spaces which is a classical extension of the real line and its properties in terms of the distance.
- The course introduces to the students, metric spaces and its properties. The properties like connectedness, completeness and compactness which are inherent in nature in the real line are extended to the metric spaces.
- Also properties like continuity and uniform continuity are exploited.

Syllabus

Major Paper 8: Real Analysis (90 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 **R**.
(Chapter 4(full))

Unit 4: Connectedness-Connected subsets of **R**-Connectedness and Continuity-Contraction Mapping Theorem.
(Chapter 5 (full) and Chapter 8 upto theorem 8.2)

Unit 5: Compactness-Comapct metric spaces-Compact subsets of **R-**Heine Borel Theorem-Equivalent Characterizations for compactness-Compactness and Continuity. (Chapter 6(full))

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2016
1-L1	Unit-I Introduction on Countable sets
2-L2	Theorems and Problems in countable sets
3- L3	Uncountable sets
4-L4	Metric spaces: Definition and examples
5-L5	Examples on a metric spaces
6-L6	Solved problems on a metric spaces
7-L7	Bounded sets in a metric spaces
8-L8	Definition of diameter and its examples
9-L9	Open ball in a metric space
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Examples in open ball
12-L11	Open sets: Definition and examples
13-L12	Theorem on open sets
14-L13	Solved problems on open sets
15-L14	Equivalentmetrices
16-L15	Subspaces: Definition and examples
17-L16	Solved problems on subspaces
18-L17	Unit-II Interior of a set: Definition and examples
19-L18	Interior of a set: Theorems
20-L19	Closed set: Definition and examples
21-L20	Closed ball: Definition, examples and theorem
22-L21	Closure: Definition and examples
23-L22	Exercise problems- **Allotting Portion for Internal Test I**
	Internal Test I begins(25-07-2016)
24-L23	Closure: Definition and theorem
25-L24	Limit point: Definition and examples
26-IT-1	**Internal Test-I**
27-L25	Limit point: Theorems
28-L26	Corollary of limit point
29-L27	Solved problems on limit point
30-L28	Exercise problems on limit point :**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Dense set: Definition and examples

32- L30	Dense set: Theorems and solved problems
33- L31	Completeness: Definition and note
34-P2	**College level meeting/Cell function**
35- L32	Completeness: Theorems and examples
36- L33	Theorems and solved problems Completeness
37- L34	Cantor’s intersection theorem
38- L35	Unit III- Baire’s category theorem- Definition and examples
39- L36	Baire’s category theorem and Solved problems
40- L37	Continuity- Definition, ,note, theorem and examples
41- L38	Theorems and solved problems
42- L39	Solved problems on Continuity
43- L40	Homeomorphism: Definition and examples
44- L41	Examples Continuity
45- L42	Isometric definition and examples
46- L43	Uniform continuity- Introduction , definition and note
47- L44	Solved problems on Continuity
48- L45	Discontinuous function on R
49- L46	Discontinuity function- Definition and examples
50- L47	Theorems on Discontinuity function
51- P3	**Department Seminar**
52- L48	Oscillation: Definition and examples
53- L49	Examples and theorem
54- L50	Theorem on Oscillation
55- L51	Unit IV: Connectedness: Introduction, definition and examples
56-L52	Solved problems on Connectedness - **Allotting portion for Internal Test-II**
	Internal Test II begins(22-08-2016)
57-L53	Connectedness and continuity- theorem
58-L54	Solved problems on Connectedness
59-IT-II	**Internal Test-II**
60- L55	Connected subsets of R- theorem
61- L56	Solved problems on Connectedness - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Contraction mapping theorem- Introduction
63- L58	Definition and examples Contraction mapping
64- L59	Contraction mapping theorem
65- L60	Theorem on Contraction mapping
66- L61	Unit V: Compactness- Introduction and Compact metric space-Definition and examples
67- L62	Theorems on Compactness
68- L63	Note and theorems on Compactness
69- L64	Theorems on Compactness
70- L65	Compact subset of R
71- L66	Heine Borel theorem
72- L67	Theorem on Compactness
73- L68	Equivalent characterisation for compactness- definition and examples
74-P4	**College level meeting/ function**
75- L69	Theorems on Compactness

76- L70	Totally bounded definition and examples
77- L71	Subsequence- definition and examples
78- L72	Corollary
79- L73	Sequentially compact- theorems - **Allotting portion for Internal Test-III**
	Internal Test III begins(03-10-2016)
80- L74	Theorems on Sequentially compact
81- L75	Solved problems on Sequentially compact
82-IT-III	**Internal Test-III**
83- L76	Compactness and continuity
84- L77	Note and theorems on Compactness and continuity - **Test Paper distribution and result analysis**
85- L78	Solved problems on Compactness and continuity
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (17-10-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course Real analysis
CO1	Recall elementary properties of real numbers which lead to the Archimedean property, countability and uncountability.
CO2	Predict correct choice of test and apply for test of convergence of series.
CO3	Demonstrate connectedness and correlate the relation between the space and its image under a continuous map with reference to connectedness.
CO4	Describe completeness and its relation with totally boundedness.
CO5	Describe compactness of a metric space and compile all equivalent definitions.
CO6	compare real line and metric space concepts
CO7	get a good foundation for the future studies in Analysis

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Application of Differential Equation
Course Code	**GSMA3A**
Class	Iyear (2016-2017)
Semester	Odd
Staff Name	J. Suresh Suseela
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- Mathematics will allow the students to develop a sophisticated understanding of mathematical structures and principles while gaining a wide range of skills that are attractive to employers.
- To reinforce and enhance the mathematical tools introduced earlier. Differential equation as a mathematical model for solving problems in chemistry is the central theme of the course.
- This course deals with differentiation, integration, differential equations and Laplace transform.

Syllabus

Application of Differential Equations

Text: Differential Equations and its Applications by -S.Narayanan and

T.K.ManicavachagomPillay,

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)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2016
1-L1	Unit I- Introduction on first order equation
2-L2	Introduction on Applications of first order equation
3- L3	Introduction on Growth, decay and chemical reaction
4-L4	Basic definition and some examples
5-L5	Derivation of Growth, decay and chemical reaction
6-L6	Example problems in Growth
7-L7	Example problems in Decay
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Example problems based on chemical reaction
10- L9	Exercise problems in Growth and decay
11-L10	Exercise problems in chemical reaction
12-L11	Unit II- Introduction on flow of water
13-L12	Introduction on flow of water from an orifice
14-L13	Derivation on flow of water from an orifice
15-L14	Example problems on flow of water from an orifice - **Allotting portion for Internal Test-I**
	Internal Test I begins 25-07-2016
16-L15	Exercise problems in flow of water
17-IT-1	**Internal Test-I**
18-L16	Introduction on falling bodies and other rate problems
19-L17	Derivation on freefall under gravity- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Problems based on freefall under gravity
21- L19	Derivation on retarded fall
22- P2	**College level meeting/Cell function**
23-L20	Problems based on retarded fall
24-L21	Exercise and example problems in flow of water
25-L22	Unit III Introduction on Brachistrochrome

26-L23	Brachistrochrome problems
27-L24	Derivation of Brachistrochrome
28-L25	Derivation of Brachistrochrome (conclusion)
29-L26	Solving Brachistrochrome problems
30-L27	Introduction on simple electric circuits
31-L28	Diagram and basic elements of simple electric circuits
32-L29	The properties and relation of the elements of simple electric circuits
33-L30	Derivation on simple electric circuits
34- P3	**Department Seminar**
35-L31	Example and exercise problems in simple electric circuits
36-L32	Unit IV- Introduction on variable mass- **Allotting portion for Internal Test-II**
	Internal Test II begins 22-08-2016
37- L33	Introduction on dynamical problems in variable mass
38- IT-II	**Internal Test-II**
39-L34	Derivation of dynamical problems in variable mass
40-L35	Example and exercise problems in Dynamical problems- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Introduction on Application to vibrations in mechanical systems
42- L37	Derivation on damped simple harmonic vibration
43- L38	Derivation on damped vibration
44- P4	**College level meeting/ function**
45-L39	Derivation on damped vibration
46-L40	Derivation on forced vibration
47-L41	Example and exercise problems in vibration
48-L42	**Unit V** Introduction on Newton's law
49-L43	Newton's law of gravitation
50-L44	Motion of particles derivation - **Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2016
51 L45	Introduction on central force
52- L46	Central gravitational force
53-IT-III	**Internal Test-III**
54-L47	Kepler's I and III law
55-L48	Newton's deduction from Kepler's law- **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test 17-10-2016**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course Application of Differential Equation
CO1	apply the concept of differentiation of functions
CO2	identify and apply partial differentiation to determine the maxima and minima of functions of two variables
CO3	evaluate definite and indefinite integrals
CO4	formulate and solve the first and second order differential equations
CO5	use Laplace transform techniques to solve differential equations

\

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Algebra and Differential Equations
Course Code	**JAMA11**
Class	II year(2016-2017)
Semester	Odd
Staff Name	Mrs. Hepzibah
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To know the order and degree of the ODE
- To understand the basic Theory of equations
- To study the concept of Laplace transforms
- To know the theory of matrices

Syllabus

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 Pp + Qq= R.

Unit V Laplace transformation – Inverse Laplace transform.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16.06.2017
1-L1	Introduction
2-L2	Theory of Equations
3- L3	Theory of Equations
4-L4	Theory of Equations
5-L5	Theory of Equations
6-L6	Theory of Equations
7-L7	Formation of Equations
8-L8	Formation of Equations
9-L9	Formation of Equations
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Formation of Equations
12-L11	Relation between roots and coefficients – Reciprocal equations
13-L12	Relation between roots and coefficients – Reciprocal equations
14-L13	Relation between roots and coefficients – Reciprocal equations
15-L14	Relation between roots and coefficients – Reciprocal equations
16-L15	Relation between roots and coefficients – Reciprocal equations
17-L16	Transformation of Equations
18-L17	Transformation of Equations
19-L18	Transformation of Equations
20-L19	Transformation of Equations
21-L20	Transformation of Equations
22-L21	Approximate solutions to equations
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(31.07.2017)
24-L23	Approximate solutions to equations
25-L24	Approximate solutions to equations
26-IT-1	**Internal Test-I**
27-L25	Approximate solutions to equations
28-L26	Newton's method and Horner's method
29-L27	Newton's method and Horner's method
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Newton's method and Horner's method
32- L30	Newton's method and Horner's method
33- L31	Newton's method and Horner's method
34-P2	**College level meeting/Cell function**
35- L32	Matrices
36- L33	Matrices
37- L34	Matrices
38- L35	Characteristic equation of a matrix
39- L36	Characteristic equation of a matrix
40- L37	Characteristic equation of a matrix
41- L38	Characteristic equation of a matrix

42- L39	Eigen values and Eigen vectors
43- L40	Eigen values and Eigen vectors
44- L41	Eigen values and Eigen vectors
45- L42	Eigen values and Eigen vectors
46- L43	Cayley Hamilton theorem and simple problems
47- L44	Cayley Hamilton theorem and simple problems
48- L45	Cayley Hamilton theorem and simple problems
49- L46	Cayley Hamilton theorem and simple problems
50- L47	Differential equation of first order but of higher degree
51- P3	**Department Seminar**
52- L48	Differential equation of first order but of higher degree
53- L49	Differential equation of first order but of higher degree
54- L50	Differential equation of first order but of higher degree
55- L51	Equations solvable for p, *x*, y
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(30.08.2017)
57-L53	Equations solvable for p, *x*, y
58-L54	Equations solvable for p, *x*, y
59-IT-II	**Internal Test-II**
60- L55	Equations solvable for p, *x*, y
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Partial differential equations
63- L58	Partial differential equations
64- L59	Partial differential equations
65- L60	formations
66- L61	formations
67- L62	formations
68- L63	solutions
69- L64	solutions
70- L65	solutions
71- L66	Standard form Pp + Qq = R
72- L67	Standard form Pp + Qq = R
73- L68	Laplace transformation
74-P4	**College level meeting/ function**
75- L69	Laplace transformation
76- L70	Laplace transformation
77- L71	Laplace transformation
78- L72	Laplace transformation
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(03.10.2017)
80- L74	Inverse Laplace transform
81- L75	Inverse Laplace transform
82-IT-III	**Internal Test-III**
83- L76	Inverse Laplace transform
84- L77	**Test Paper distribution and result analysis**
85- L78	Inverse Laplace transform
	Entering Internal Test-III Marks into University portal

86-MT	**Model Test (19.10.2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra and Differential Equations"
CO1	Students gain the knowledge on order and degree of ODE.
CO2	Learners understand the basic Theory of equations.
CO3	Learners study the concept of Laplace transforms.
CO4	Gain knowledge on Theory of matrices.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B.Sc Mathematics
Course Name	Statistics I
Course Code	**JAST11**
Class	I year (2016-2017)
Semester	Odd
Staff Name	Mrs.T.Santhakumari
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- How to calculate and apply measures of location and measures of dispersion –grouped and ungrouped data cases.
- How to calculate correlation and regression in various business problems.
- How to apply attributes to various types of problems.
- How to apply discrete and continuous probability distributions to various business problems.
- Provide a foundation and motivation for exposure to statistical ideas subsequent to the course.

Syllabus

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Mathematics) Semester-1/Allied -1
(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.

Text Book:
Gupta .S.C and V.K. Kapoor – Fundamentals of Mathematical Statistics - (2002) Sultan Chand & Sons, New Delhi.

Books for Reference:
1. Vittal, V.R. - Mathematical Statistics (2004) Maragatham Publications
2. D.C. Sancheti&Kapoor - Statistics
3. M.L. Khanna - Statistics
4. S. Arumugam& others - Statistics

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2016
1-L1	Introduction
2-L2	Moments, Skewness and Kurtosis
3- L3	Moments, Skewness and Kurtosis
4-L4	Moments, Skewness and Kurtosis
5-L5	Curve fitting
6-L6	Curve fitting
7-L7	Curve fitting
8-L8	method of least squares
9-L9	method of least squares
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Fitting lines
12-L11	Fitting lines
13-L12	Parabolic, Exponential and Logarithmic curves
14-L13	Parabolic, Exponential and Logarithmic curves
15-L14	Parabolic, Exponential and Logarithmic curves
16-L15	Correlation and Regression
17-L16	Correlation and Regression
18-L17	Scatter Diagram
19-L18	Scatter Diagram
20-L19	Karl Pearson's coefficient ofcorrelation
21-L20	Karl Pearson's coefficient ofcorrelation
22-L21	Properties

23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(25.07.2016)
24-L23	Lines of Regression
25-L24	Lines of Regression
26-IT-1	**Internal Test-I**
27-L25	Coefficient of Regression and properties
28-L26	Coefficient of Regression and properties
29-L27	Rank Correlation
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Rank Correlation
32- L30	Association of Attributes
33- L31	Association of Attributes
34-P2	**College level meeting/Cell function**
35- L32	Consistency of data
36- L33	Consistency of data
37- L34	criteria for independence
38- L35	criteria for independence
39- L36	Yule's coefficient of Association
40- L37	Yule's coefficient of Association
41- L38	Yule's coefficient of Association
42- L39	Random variable
43- L40	Random variable
44- L41	Distribution function
45- L42	Distribution function
46- L43	properties of Distribution function
47- L44	properties of Distribution function
48- L45	properties of Distribution function
49- L46	Mathematical Expectation
50- L47	Mathematical Expectation
51- P3	**Department Seminar**
52- L48	Addition theorem of Expectation
53- L49	Addition theorem of Expectation
54- L50	Addition theorem of Expectation
55- L51	Multiplication theorem of Expectation
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(22.08.2016)
57-L53	Multiplication theorem of Expectation
58-L54	Moment generating function
59-IT-II	**Internal Test-II**
60- L55	Moment generating function
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Cumulants
63- L58	Cumulants
64- L59	characteristic function
65- L60	characteristic function
66- L61	characteristic function

67- L62	Properties of characteristic function
68- L63	Properties of characteristic function
69- L64	Discrete and continuous Probability Distributions
70- L65	Discrete and continuous Probability Distributions
71- L66	Discrete and continuous Probability Distributions
72- L67	Binomial and PoissonDistribution and their moments
73- L68	Binomial and PoissonDistribution and their moments
74-P4	**College level meeting/ function**
75- L69	Generating function, characteristic function
76- L70	Generating function, characteristic function
77- L71	Standard normal distribution and their properties
78- L72	Standard normal distribution and their properties
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(03.10.2016)
80- L74	properties and simple applications
81- L75	properties and simple applications
82-IT-III	**Internal Test-III**
83- L76	simple problems
84- L77	**Test Paper distribution and result analysis**
85- L78	simple problems
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (17.10.2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30.11.2016

Course Outcomes

Learning Outcomes	**COs** of the course “Statistics I”
CO1	Students learn the concept of measures of dispersion.
CO2	Students learn the concept of measures of central tendencies.
CO3	Gain the knowledge on probability distributions.
CO4	Gain knowledge on Concepts of Random Variables and Distributions.
CO5	Acquire knowledge on Basic Concepts of Expectation and continuous & discrete distribution.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Numerical Methods
Course Code	**JMMA5A**
Class	III year (2016-2017)
Semester	Odd
Staff Name	Mr. J. Vijaya Xavier Parthiban
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the finite differences
- To solve numerical problems by different methods

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-V/
Major ElectiveI (A)

NUMERICAL METHODS

Unit I Solution of Numerical algebraic and Transcendental Equations: bisection method – Newton‟s method. Criterion of order of convergence of Newton's method. Regula False method – Gauss elimination – Gauss Jacobi – Gauss Seidal method

Unit II Finite Difference: First and higher order differences – Forward and backward differences – Properties of Operator – Differences of a polynomial –Factorial polynomial – Error propagation operator E and E-1. Relation among Δ, E, δ and D

Unit III Interpolation : Newton's Forward – backward, Gauss forward – backward interpolation formula – Bessel's formula. Divided differences – Newton's divided difference formula – Lagrange's interpolation formulae – Inverse interpolation formula.

Unit IV Numerical Differentiation and Integration: Newton's forward and backward differences for differentiation – Derivatives using Bessel's formula – Trapezoidal rule, simpson's 1/3 rule & 3/8 rule – Weddle's rule.

Unit V Difference Equations: Definition – order and degree of difference equation – Linear difference equation – Finding complementary function – particular Integral – simple applications.

Text Books:

Venkataraman .M.L – Numerical methods in Science and Engineering National Publishing Company V Edition 1998.

Books for Reference:

1. Kandasamy .P.K. Thilagavathy and K. Gunavathy „Numerical Methods‟ S. Chand & Company Ltd. Edn. 2006.
2. B. Stephen John – Numerical Analysis
3. Venkatraman .M.L - Numerical methods in Science and Engineering National Publishing Company V Edition 1998.
4. Autar Kaw and Egwwn Enc Kalu - Numerical methods with Application Abidet. Autokaw.com 2^{nd}2011.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-06-2018
1-L1	Introduction
2-L2	Solution of Numerical algebraic and Transcendental Equations
3- L3	Solution of Numerical algebraic and Transcendental Equations
4-L4	bisection method
5-L5	bisection method
6-L6	bisection method
7-L7	Newton's method
8-L8	Newton's method
9-L9	Criterion of order of convergence of Newton's method
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Criterion of order of convergence of Newton's method
12-L11	Regula False method
13-L12	Regula False method
14-L13	Gauss elimination
15-L14	Gauss elimination
16-L15	Gauss Jacobi
17-L16	Gauss Jacobi
18-L17	Gauss Seidal method
19-L18	Gauss Seidal method
20-L19	First and higher order differences
21-L20	First and higher order differences
22-L21	Forward and backward differences
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**

	Internal Test I begins(30-07-2018)
24-L23	Forward and backward differences
25-L24	Forward and backward differences
26-IT-1	**Internal Test-I**
27-L25	Properties of Operator
28-L26	Properties of Operator
29-L27	Differences of a polynomial
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Differences of a polynomial
32- L30	Factorial polynomial
33- L31	Factorial polynomial
34-P2	**College level meeting/Cell function**
35- L32	Error propagation operator E and E-1. Relation among Δ, E, δ and D
36- L33	Error propagation operator E and E-1. Relation among Δ, E, δ and D
37- L34	Interpolation : Newton's Forward – backward
38- L35	Interpolation : Newton's Forward – backward
39- L36	Interpolation : Newton's Forward – backward
40- L37	Gauss forward – backward interpolation formula
41- L38	Gauss forward – backward interpolation formula
42- L39	Gauss forward – backward interpolation formula
43- L40	Bessel's formula
44- L41	Bessel's formula
45- L42	Divided differences
46- L43	Newton's divided difference formula
47- L44	Newton's divided difference formula
48- L45	Lagrange's interpolation formulae
49- L46	Lagrange's interpolation formulae
50- L47	Inverse interpolation formula
51- P3	**Department Seminar**
52- L48	Inverse interpolation formula
53- L49	Newton's forward and backward differences for differentiation
54- L50	Newton's forward and backward differences for differentiation
55- L51	Derivatives using Bessel's formula
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(03-09-2018)
57-L53	Derivatives using Bessel's formula
58-L54	Trapezoidal rule, simpson's 1/3 rule & 3/8 rule – Weddle's rule.
59-IT-II	**Internal Test-II**
60- L55	Trapezoidal rule, simpson's 1/3 rule & 3/8 rule – Weddle's rule
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Trapezoidal rule, simpson's 1/3 rule & 3/8 rule – Weddle's rule
63- L58	Difference Equations **:** Definition
64- L59	order and degree of difference equation
65- L60	order and degree of difference equation
66- L61	order and degree of difference equation
67- L62	Linear difference equation

68- L63	Linear difference equation
69- L64	Linear difference equation
70- L65	Finding complementary function
71- L66	Finding complementary function
72- L67	particular Integral
73- L68	particular Integral
74-P4	**College level meeting/ function**
75- L69	particular Integral
76- L70	simple applications
77- L71	simple applications
78- L72	simple applications
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(08-10-2018)
80- L74	Problems
81- L75	Problems
82-IT-III	**Internal Test-III**
83- L76	Problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-10-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Numerical Methods”
CO1	Gaining knowledge on the finite differences.
CO2	Enable the students to solve numerical problems by different methods

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc. Mathematics
Course Name	Classical Algebra
Course Code	**JMMA12**
Class	I year (2016-2017)
Semester	Odd
Staff Name	Dr(Mrs) J. Suresh Suseela, Dr A. Alwyn Asir
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Gain the knowledge of Theory of equations .
- Understanding the concept of Powers of the roots of the equations
- To provide the understanding of Newton's method, Horner's method

Syllabus

MSU/2016-17/UG-Colleges/Part-III (B. Sc. Mathematics) Semester- I/Core-2

CLASSICAL ALGEBRA

Unit I Theory of Equations-Formation of equations-Relation between roots and Coefficients-symmetric function of the roots.

Unit II Sum of the powers of the roots of an equation-Newton's theorem, Reciprocal Equations.

Unit III Transformation of equations, Descarte's rule of signs-Rolle's theorem

Unit IV Multiple roots, Sturm's Theorem, solving appropriate solution of equations using Newton's and Horner's method.

Unit V Biquadratic equations-solution by Ferrari's method-cubic equationssolutions by Cardon's method.

Text Book:

ManickavasagamPillai .T.K and S.Narayanan – Algebra-ViswanathanPublishers and Printers Pvt.Ltd.,-2004.

Books for Reference:

1.Kandasamy P and K.Thilagavathi-Mathematics for B.Sc.,-2004,Volume I and Volume IV,S.Chand&Co.,New Delhi.
2.Arumugam.S,ThangapandiIssac-Classical Algebra,New Gamma Publishing House,Palayamkottai.
3.Burnside.W.S.and A.W.Panton-The Theory of Equations,Dublin University Press,1954.
4.MacDuffee.C.C.-Theory of Equations,John Wiley&Sons Inc.,1954.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16.06.2016
1-L1	Introduction
2-L2	Theory of Equations
3- L3	Theory of Equations
4-L4	Theory of Equations
5-L5	Formation of equations
6-L6	Formation of equations
7-L7	Formation of equations
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Relation between roots and Coefficients
10- L9	Relation between roots and Coefficients
11-L10	Relation between roots and Coefficients
12-L11	Relation between roots and Coefficients
13-L12	symmetric function of the roots
14-L13	symmetric function of the roots
15-L14	symmetric function of the roots
16-L15	symmetric function of the roots
17- L16	Sum of the powers of the roots of an equation
18- L17	Sum of the powers of the roots of an equation
19- L18	Sum of the powers of the roots of an equation
20- L19	Newton's theorem
21- L20	Problem Discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins(25.07.2016)
22- L21	Newton's theorem
23- IT-1	**Internal Test-I**
24- L22	ReciprocalEquations
25- L23	ReciprocalEquations
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal

27- L25	ReciprocalEquations
28- L26	Transformation of equations
29- L27	Transformation of equations
30- P2	**College level meeting/Cell function**
31-L28	Descarte's rule of signs
32-L29	Descarte's rule of signs
33-L30	Descarte's rule of signs
34- L31	Rolle's theorem
35- L32	Rolle's theorem
36- L33	Rolle's theorem
37- L34	Multiple roots
38- L35	Multiple roots
39- L36	Multiple roots
40- L37	Sturm's Theorem
41- L38	Multiple roots
42-P3	**Department Seminar**
43- L39	solving appropriate solution of equations usingNewton's and Horner's method.
44- L40	solving appropriate solution of equations usingNewton's and Horner's method.
45- L41	solving appropriate solution of equations usingNewton's and Horner's method.
46- L42	solving appropriate solution of equations usingNewton's and Horner's method.
47- L43	Problem Discussion - **Allotting portion for Internal Test-II**
	Internal Test II begins(22.08.2016)
48- L44	solving appropriate solution of equations usingNewton's and Horner's method.
49-IT-II	**Internal Test-II**
50-L45	Problems
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Problems
53- L48	Problems
54- L49	Biquadratic equations
55- L50	Biquadratic equations
56- L51	Biquadratic equations
57- L52	Biquadratic equations
58- L53	cubic equations solutionsby Cardon's method
59-P4	**College level meeting/ function**
60- L54	cubic equations solutionsby Cardon's method
61- L55	cubic equations solutionsby Cardon's method
62- L56	cubic equations solutionsby Cardon's method
63- L57	Problems
64- L58	Problem Discussion - **Allotting portion for Internal Test-III**
	Internal Test III begins(03.10.2016)
65- L59	Problems
66- L60	Revision
67-IT-III	**Internal Test-III**
68- L61	Problem Discussion
69- L62	Problem Discussion
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal

71-MT	**Model Test (17.10.2016)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30.11.2016

Course Outcomes

Learning Outcomes	**COs** of the course "Classical Algebra"
CO1	Enable the students to learn about the convergence and divergence of the series and to find the roots for the different types of the equations.
CO2	On successful completion of this course the students should have gained knowledge about the convergence of series and solving equations.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Mechanics
Course Code	**JMMA52**
Class	III year (2016-2017)
Semester	Odd
Staff Name	Mrs. S.Shyamala MaliniMiss. C.Henrietta Johnsy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To provide the basic knowledge of equilibrium of a particle
- To provide a basic knowledge of the behaviour of objects in motion
- To develop a working knowledge to handle practical problems

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-V/ Core - 8
MECHANICS

Unit I Forces acting at a point : Forces acting at a point – types of forces – Triangle of forces – Polygon of forces – Lami's theorem – Parallel Forces and moments – Resultant of two like parallel forces, unlike and unequal parallel forces – moment of a force – Varignon's theorem of moments.

Unit II Equilibrium of Strings and Chains : Equilibrium of strings and chains – Common catenary – Suspension bridge.

Unit III Projectiles : Projectiles : Equation of Path – Maximum height – Time of flight – Range.

Unit IV Simple Harmonic Motion : Simple harmonic motion (SHM) in a straight line – Geometrical representation – Composition of SHM"s of same period in the same line and along two perpendicular direction – SHM as a curve – Simple pendulum – Simple equivalent pendulum. The seconds pendulum.

Unit V Motion under the action of Central Forces : Velocity and acceleration in Polar co-ordinates – Differential equation of Central Orbit – Pedal equation of Central Orbit.

Text Books :

1) Venkataraman .M.K., - Statics, Agastiar Publications 2002, Trichy.
2) Venkataraman .M.K, -A text book on Dynamics, 2001, Agastiar Publications, Trichy.

Books for Reference :

1. Venkataraman .M.K., - Statics, Agastiar Publications 2002, Trichy.
2. Venkataraman .M.K, - A text book on Dynamics, 2001, Agastiar Publications, Trichy.
3. Duraipandian .P, Laxmi Duraipandian and Muthumizh Jayapragasam, Mechanics, 2003, S.Chand and Company.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-06-2018
1-L1	Introduction
2-L2	Simple harmonic motion (SHM) in a straight line
3- L3	Simple harmonic motion (SHM) in a straight line
4-L4	Simple harmonic motion (SHM) in a straight line
5-L5	types of forces
6-L6	Triangle of forces
7-L7	Triangle of forces
8-L8	Polygon of forces
9-L9	Polygon of forces
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Lami's theorem
12-L11	Parallel Forces and moments
13-L12	Parallel Forces and moments
14-L13	Resultant of two like parallel forces, unlike and unequal parallel forces
15-L14	Resultant of two like parallel forces, unlike and unequal parallel forces
16-L15	moment of a force
17-L16	Varignon's theorem of moments
18-L17	Equilibrium of strings and chains
19-L18	Equilibrium of strings and chains
20-L19	Equilibrium of strings and chains
21-L20	Equilibrium of strings and chains
22-L21	Common catenary
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(30-07-2018)
24-L23	Common catenary
25-L24	Common catenary
26-IT-1	**Internal Test-I**
27-L25	Suspension bridge
28-L26	Suspension bridge
29-L27	Suspension bridge
30-L28	**Test Paper distribution and result analysis**

	Entering Internal Test-I Marks into University portal
31- L29	Projectiles
32- L30	Equation of Path
33- L31	Equation of Path
34-P2	**College level meeting/Cell function**
35- L32	Maximum height
36- L33	Maximum height
37- L34	Maximum height
38- L35	Time of flight
39- L36	Time of flight
40- L37	Range
41- L38	Range
42- L39	Simple harmonic motion (SHM) in a straight line
43- L40	Simple harmonic motion (SHM) in a straight line
44- L41	Simple harmonic motion (SHM) in a straight line
45- L42	Geometrical representation
46- L43	Geometrical representation
47- L44	Composition of SHM"s of same period in the same line and along two perpendicular direction
48- L45	Composition of SHM"s of same period in the same line and along two perpendicular direction
49- L46	Composition of SHM"s of same period in the same line and along two perpendicular direction
50- L47	SHM as a curve
51- P3	**Department Seminar**
52- L48	SHM as a curve
53- L49	Simple pendulum
54- L50	Simple pendulum
55- L51	Simple equivalent pendulum. The seconds pendulum
56-L52	Problem Discussions -**Allotting portion for Internal Test-II**
	Internal Test II begins(03-09-2018)
57-L53	Simple equivalent pendulum. The seconds pendulum
58-L54	Simple equivalent pendulum. The seconds pendulum
59-IT-II	**Internal Test-II**
60- L55	Motion under the action of Central Forces
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Motion under the action of Central Forces
63- L58	Velocity and acceleration in Polar co-ordinates
64- L59	Velocity and acceleration in Polar co-ordinates
65- L60	Velocity and acceleration in Polar co-ordinates
66- L61	Velocity and acceleration in Polar co-ordinates
67- L62	Differential equation of Central Orbit
68- L63	Differential equation of Central Orbit
69- L64	Differential equation of Central Orbit
70- L65	Differential equation of Central Orbit
71- L66	Pedal equation of Central Orbit
72- L67	Pedal equation of Central Orbit

73- L68	Pedal equation of Central Orbit
74-P4	**College level meeting/ function**
75- L69	Exercise Problems
76- L70	Exercise Problems
77- L71	Exercise Problems
78- L72	Exercise Problems
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(08-10-2018)
80- L74	Revision
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Problems Discussion
84- L77	**Test Paper distribution and result analysis**
85- L78	Problems Discussion
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test(22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-10-2018

Course Outcomes

Learning Outcomes	**COs** of the course "Mechanics"
CO1	Enable the students to realize the nature of forces and resultant forces when more than one force is acting on a particle.
CO2	On successful completion of course the students should realize the concept about the forces, resultant force of more than one force acting on a surface, friction and center of gravity. Also he can differentiate static and dynamic forces.
CO3	Enable the students with the basic knowledge of equilibrium of a particle
CO4	Enable the students to develop a working knowledge to handle practical problems
CO5	Acquire basic knowledge on the behaviour of objects in motion.
CO6	Enable the students to develop a working knowledge to handle practical problems.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Vector Calculus
Course Code	**JSMA3A**
Class	II year (2016-2017)
Semester	Odd
Staff Name	Mrs.Hebzibha
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To provide basic knowledge of vector differentiation and vector integration
- To solve problems related to that
- To explain about line integrals, surface integrals

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2017
1-L1	Intoduction
2-L2	Vector point functions
3- L3	Vector point functions
4-L4	Scalar point functions
5-L5	Scalar point functions
6-L6	Scalar point functions
7-L7	problems
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Derivative of a Vector & Derivative of sum of vectors
10- L9	Derivative of a Vector & Derivative of sum of vectors
11-L10	Derivative of product of a Scalar and Vector point function
12-L11	Derivative of product of a Scalar and Vector point function
13-L12	The vector operator „del‟ - Gradient
14-L13	The vector operator „del‟ - Gradient
15-L14	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(31.07.2017)
16-L15	Divergence
17-IT-1	**Internal Test-I**
18-L16	Divergence
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Curl, solenoidal, irrotational vectors
21- L19	Curl, solenoidal, irrotational vectors
22- P2	**College level meeting/Cell function**
23-L20	Curl, solenoidal, irrotational vectors
24-L21	Problems
25-L22	Problems
26-L23	Laplacian operator.
27-L24	Laplacian operator.
28-L25	Laplacian operator.
29-L26	Integration of point function
30-L27	Integration of point function
31-L28	Integration of point function
32-L29	Line integral
33-L30	Line integral

34- P3	**Department Seminar**
35-L31	Surface integral.
36-L32	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(30.08.2017)
37- L33	Surface integral.
38- IT-II	**Internal Test-II**
39-L34	Volume integral
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Volume integral
42- L37	Volume integral
43- L38	Gauss divergence theorem (statement only)
44- P4	**College level meeting/ function**
45-L39	Problems.
46-L40	Problems.
47-L41	Problems.
48-L42	Greens theorem and Stoke"s theorem (statements only)
49-L43	Greens theorem and Stoke"s theorem (statements only)
50-L44	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(03.10.2017)
51 L45	problems
52- L46	problems
53-IT-III	**Internal Test-III**
54-L47	problems
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test (19.10.2017)**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Vector Calculus"
CO1	Acquire basic knowledge of vector differentiation and vector integration.
CO2	Enable the students to solve problems related to that.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Statistics-II
Course Code	**SAST21**
Class	I year (2017-2018)
Semester	Even
Staff Name	Dr. S. Shyamala Malini
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To know the concept of index numbers
- To study the distribution functions
- To understand the Analysis of variance

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Allied –II

SEMESTER – II / IV
Statistics (For Mathematics Students)
Paper – II (90 Hours)

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.

Text Book:
• Gupta .S.C & V.K. Kapoor – Fundamentals of Mathematical Statistics – (2002) Sultan Chand & Sons, New Delhi.

Books for Reference :
• Vittal .P.R – Mathematical Statistic (2004) – Maragatham Publications
• DC Sancheti& Kapoor – Statistics
• M.L. Khanna – Statistics
• S. Arumugam & others – Statistics

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Characteristics of index numbers
3- L3	Laspeyer's index numbers
4-L4	Paasche's index numbers
5-L5	Bowley's index numbers
6-L6	Marshall's index numbers
7-L7	Marshall's index numbers
8-L8	Edgeworth's index numbers
9-L9	Tests-Unit test
10-P1	**Inauguration of Mathematics Association**
11-L10	Commodity reversal test
12-L11	Time reversal test, Circular test
13-L12	Unit-II Introduction

14-L13	Testing of hypothesis
15-L14	Testing of hypothesis
16-L15	Null hypothesis
17-L16	Null hypothesis
18-L17	Alternate hypothesis
19-L18	Type I errors
20-L19	Type II errors
21-L20	Critical region
22-L21	Level of significance
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
24-L23	Test of significance for large samples
25-L24	Test of significance for large samples
26-IT-1	**Internal Test-I**
27-L25	Testing a single proportion
28-L26	Testing a single proportion
29-L27	Difference of proportions
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Difference of proportions
32- L30	Testing a single mean
33- L31	Testing a single mean
34-P2	**College level meeting/Cell function**
35- L32	Difference of means
36- L33	Difference of means
37- L34	Unit-III Introduction
38- L35	Tests based on t-distribution
39- L36	Tests based on t-distribution
40- L37	single mean
41- L38	Difference of means
42- L39	Tests based on F-distribution
43- L40	Tests based on F-distribution
44- L41	Variance Ratio test
45- L42	Variance Ratio test
46- L43	Tests based on Chi-square Distribution
47- L44	Tests based on Chi-square Distribution
48- L45	Independence – Goodness of fit
49- L46	Unit-IV Introduction
50- L47	Analysis of varience
51- P3	**Department Seminar**
52- L48	Analysis of varience
53- L49	one way and two way classified data
54- L50	one way and two way classified data
55- L51	Basis of experimental design
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
57-L53	Randomized Block Design

58-L54	Randomized Block Design
59-IT-II	**Internal Test-II**
60- L55	Latin square
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Latin square
63- L58	simple problems.
64- L59	simple problems.
65- L60	Unit-V Introduction
66- L61	Statistical Quality control
67- L62	Statistical Quality control
68- L63	Statistical Quality control
69- L64	Definition – Advantages, Process control
70- L65	Definition – Advantages, Process control
71- L66	Definition – Advantages, Process control
72- L67	Definition – Advantages, Process control
73- L68	Control chart
74-P4	**College level meeting/ function**
75- L69	Mean chart
76- L70	Range chart
77- L71	P-chart
78- L72	Product Control
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
80- L74	Product Control
81- L75	Sampling Inspection Plans
82-IT-III	**Internal Test-III**
83- L76	Sampling Inspection Plans
84- L77	**Test Paper distribution and result analysis**
85- L78	Sampling Inspection Plans
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test12-04-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Statistics-II>”
CO1	Students acquire the knowledge on Basic concepts of

	Sampling and testing of Hypothesis
CO2	Learners knowledge of Testing of Hypothesis for real life problems and for small samples.
CO3	Gain knowledge about various types of Estimators
CO4	Learners learn the Concepts of Correlation and rank correlation coefficient
CO5	Gain Practical Knowledge of Correlation and Rank Correlation Coefficient, t-distribution and F-distribution
CO6	Gain knowledge on statistical quality control

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Number Theory
Course Code	**GMMA6A**
Class	III year (2017-2018)
Semester	Even
Staff Name	J. Subhashini
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The study of number theory inevitably includes knowledge of the problems and techniques of elementary number theory, however the tools which have evolved to address such problems and their generalizations are both analytic and algebraic, and often intertwined in surprising ways. This course covers topics from classical number theory including discussions of mathematical induction, prime numbers, division algorithms, congruences, and quadratic reciprocity.

Syllabus

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 theChience Reminder Theorem.

(Chapter 4: Sections 4.2 to 4.4)

Unit 5: Fermat‘s Theorem-Wilson‘s Theorem.
(Chapter 5: Sections 5.2, 5.3)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 07-12-2017
1-L1	Unit – I Introduction
2-L2	Mathematical Induction
3- L3	Well Ordering Principle
4-L4	First principle of finite induction
5-L5	First principle problems
6-L6	First principle problems
7-L7	Bernoulli’s inequality
8-L8	Second principle of induction
9-L9	Lucas sequence
10-P1	**Inauguration of Mathematics Association**
11-L10	Second principle problems
12-L11	Pascal rule
13-L12	Newton’s identity
14-L13	Binomial theorem
15-L14	Cantalan number and Problems
16-L15	Pentagonal number
17-L16	Early Number Theory
18-L17	Unit – II Division Algorithm
19-L18	Division Algorithm related Corollary , Example
20-L19	Division Algorithm related problems
21-L20	Greatest Common Divisor – Definitions , Example , Note
22-L21	Greatest Common Divisor related Theorems , Corollary
23-L22	Relatively prime , Euclidean lemma - **Allotting portion for Internal Test-I**
	Internal Test I begins (22.01.2018)
24-L23	Mathematical Induction’s Problems
25-L24	Euclidean Algorithm and GCD problems
26-IT-1	**Internal Test-I**
27-L25	Least Common Multiple – Definitions , Theorems
28-L26	Least Common Multiple – Problems
29-L27	Diophantine equation – Definitions , Theorems

30-L28	Diophantine equations Corollary - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Diophantine equation's Examples
32- L30	Diophantine equation's Problems
33- L31	Divisions Algorithm's more problems
34-P2	**College level meeting/Cell function**
35- L32	Divisions Algorithm's problems
36- L33	Unit – III Primes and their distributions
37- L34	Composite number's definitions and theorems
38- L35	Corollary to the above theorems
39- L36	Fundamental theorem of Arithmetic
40- L37	Pythagoras theorem
41- L38	Pythagoras theorem related problems
42- L39	Pythagoras theorem related results
43- L40	The Sieve of Eratosthenes – Explanation
44- L41	The Sieve of Eratosthenes related problems
45- L42	Euclid theorem
46- L43	Euclidean number's definition and examples
47- L44	Euclidean number's theorems and result
48- L45	Euclidean number's corollary
49- L46	Repunit – Definition and Theorem
50- L47	Other two theorems on repunit
51- P3	**Department Seminar**
52- L48	Twin prime – Examples and Problems
53- L49	Unit – IV Theory of Congruence
54- L50	Definitions and Theorems on Congruence
55- L51	Properties for congruence
56-L52	Problems for congruence - **Allotting portion for Internal Test-II**
	Internal Test II begins (26.02.2018)
57-L53	Congruence related problems
58-L54	Binary and decimal representation of integers
59-IT-II	**Internal Test-II**
60- L55	Binary representation related problems
61- L56	Solution of congruence – Definitions and Corollary - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Decimal expansion's theorems and problems
63- L58	Polyndrome – Definitions and Problems
64- L59	Linear Congruence Theorem
65- L60	Problems on Linear Congruence
66- L61	Chinese Remainder Theorem
67- L62	Theorem on System of Linear Congruence
68- L63	System of Linear Congruence's problems
69- L64	System of Linear Congruence's problems
70- L65	Unit – V Fermat Theorem
71- L66	Corollary to Fermat Theorem
72- L67	Lemma to the above Corollary
73- L68	Wilson's Theorem

74-P4	**College level meeting/ function**
75- L69	Quadratic Congruence's Theorem
76- L70	Fermat – Kraitchik factorisation method
77- L71	Problems on Fermat's method
78- L72	Pseudoprime – Definition and Theorems
79- L73	Absolute Pseudoprime - Definitions **- Allotting portion for Internal Test-III**
	Internal Test III begins (1.04.2018)
80- L74	Absolute Pseudoprime – Notes
81- L75	Problems on Wilson's theorems
82-IT-III	**Internal Test-III**
83- L76	Problems on Wilson's theorem
84- L77	Problems on Fermat theorem - **Test Paper distribution and result analysis**
85- L78	Problems using Fermat theorem
	Entering Internal Test-III Marks into University portal **Model test beings (12.04.2018)**
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course Number Theory
CO1	Recall the basic concepts of divisibility.
CO2	Demonstrate renowned theorems in solving congruences.
CO3	Discuss on quadratic congruence equations.
CO4	Analyse various arithmetical functions.
CO5	Identify the numbers of special form and apply divisibility rules in solving Diophantine equations.
CO6	Have an in-depth knowledge in division algorithm, Euclidean algorithm and its applications.
CO7	Understand the concept of well-ordering principle and Archimedean property.
CO8	Acquire the basic properties of congruence.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2017-2018)

(Prepared by staff member handling the course)

Programme Name	B.Sc Mathematics
Course Name	COMPLEX ANALYSIS
Course Code	**GMMA61**
Class	III year (2017-2018)
Semester	Even
Staff Name	C. Henrietta Johnsy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Complex analysis, traditionally known as the theory of functions of a complex variable, is the branch of mathematical analysis that investigates functions of complex numbers. It is useful in many branches of mathematics, including algebraic geometry, number theory, analytic combinatorics, applied mathematics; as well as in physics, including hydrodynamics and thermodynamics and also in engineering

Syllabus

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- $f(c\cos\theta, \sin\theta)d\theta$only.

(Chapter 7: Sections 7.2, 7.4 and Chapter 8: Sections 8.1 to 8.3)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	UNIT-I Functions of a complex variable
2-L2	Definition of limits
3- L3	Definition of Conjugation and modulus
4-L4	Solved problems on conjugation and modulus
5-L5	Definition of Inequality
6-L6	Definition of Square root
7-L7	Solved problems on square root
8-L8	Definition of Geometrical Representation of complex number
9-L9	Polar form of a complex number
10-P1	**Inauguration of Mathematics Association**
11-L10	Definition of n^{th} roots of complex numbers.
12-L11	Exercise problems on Geometrical Representation of complex number
13-L12	Definition of Straight lines and Circle
14-L13	Regions in the complex plane
15-L14	Example of Regions in the complex plane
16-L15	The Extended complex plane
17-L16	Solved problems on The Extended complex plane
18-L17	UNIT-II Definition of Analytic functions
19-L18	Exercise problems on Analytic functions
20-L19	Limits and definition
21-L20	Examples of limits
22-L21	Theorems on limit
23-L22	Exercise problems on limits - **Allotting portion for Internal Test-I**
	Internal Test I begins (22-01-2018)
24-L23	Definition of Continuous functions

25-L24	Definition of Differentiability
26-IT-1	**Internal Test-I**
27-L25	Exercise problems on Differentiability
28-L26	Theorem of Cauchy- Riemann Equations
29-L27	Examples of Cauchy- Riemann Equations
30-L28	Alternate form of Cauchy- Riemann Equations - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Definition of Analytic functions
32- L30	Solved problems on Analytic functions
33- L31	Definition of Harmonic functions
34-P2	**College level meeting/Cell function**
35- L32	Milne-Thompson method
36- L33	UNIT-III Definition of Bilinear transformations
37- L34	Definition of Elementary transformations
38- L35	Solved problems on Elementary transformations
39- L36	Definition of Bilinear or Mobius transformation
40- L37	Theorems on Bilinear transformations
41- L38	Solved problems on Bilinear transformations
42- L39	Definition of Cross ratio
43- L40	Solved problems on Cross ratio
44- L41	Exercise problems on Cross ratio
45- L42	Fixed points of Bilinear transformations
46- L43	Theorems on Bilinear transformations
47- L44	Solved problems on Bilinear transformations
48- L45	Exercise problems on Bilinear transformations
49- L46	UNIT-IV Definition of Definite integral
50- L47	Definition of integral
51- P3	**Department Seminar**
52- L48	Solved problems on Definite integral
53- L49	Cauchy's theorem
54- L50	Definition of Cauchy's theorem
55- L51	Cauchy's theorem for multiply connected region
56-L52	Cauchy's integral formula- **Allotting portion for Internal Test-II**
	Internal Test II begins (22-01-2018)
57-L53	Maximum Modulus theorem
58-L54	Solved problems on Maximum Modulus
59-IT-II	**Internal Test-II**
60- L55	Definition of Higher derivatives
61- L56	Liouville's Theorem- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Solved problems on Higher derivatives
63- L58	Definition ofTaylor's series
64- L59	Examples on Taylor's series
65- L60	Solved problems on Taylor's series
66- L61	Exercise problems on Taylor's series
67- L62	UNIT – V Definition of Laurent's series
68- L63	Laurent's theorem

69- L64	Solved problems on Laurent's series
70- L65	Definition of Singularities
71- L66	Examples of Singularities
72- L67	Theorem on Singularities
73- L68	Solved problems on Singularities
74-P4	**College level meeting/ function**
75- L69	Definition of Residues
76- L70	Solved problems on Residues
77- L71	Cauchy's Residue theorem
78- L72	Argument theorem
79- L73	Roche's theorem- **Allotting portion for Internal Test-III**
	Internal Test III begins (01-04-2018)
80- L74	Solved problems on Residues
81- L75	Evaluation of Definite integrals
82-IT-III	**Internal Test-III**
83- L76	Solved problems on Definite integrals
84- L77	Exercise problems on Definite integrals - **Test Paper distribution and result analysis**
85- L78	Solved problems on Definite integrals
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (12-04-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course Complex Analysis
CO1	Explain the geometry of complex numbers. Demonstrate bilinear transformation as composition of elementary transformations. Compile the relation between bilinear transformation and cross ratio.
CO2	Differentiate differentiability and analyticity. Characterize analytic function with Cauchy Riemann equations and further properties of partial derivatives.
CO3	Outline the procedure for integration of complex functions. Use Cauchy's integral formula and its consequences to prove most important theorems.
CO4	Compute power series expansion in connected region, annular region of an analytic function.
CO5	Identify different types of singularities and poles, calculate the residue. Use contour integration to find integrals of real valued functions of certain type.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	LINEAR PROGRAMMING
Course Code	**GMMA62**
Class	III year (2017-2018)
Semester	Even
Staff Name	J VIJAYA XAVIER PARITHIPAN
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- This course aims to develop students to use quantitative methods and techniques for effective decision making, mathematical model formulation and applications that are used in solving real life problems.

Syllabus

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)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07.12.2017
1-L1	Introduction of linear programming Problems
2-L2	Formation of linear programming problem.
3- L3	Solved problems in LPP.
4-L4	Exercise problem in LLPP.
5-L5	Mathematical formulation of a LPP.
6-L6	LPP in summation Notation and Matrix Form.
7-L7	Canonical form in Linear programming problem
8-L8	Remarks in LPP.
9-L9	Standard form of LPP.
10-P1	**Inauguration of Mathematics Association**
11-L10	Solved problems.
12-L11	Solved problems to find basic feasible solution.
13-L12	Theorems on basic feasible solutions.
14-L13	Theorems on basic feasible solutions.
15-L14	Notations and illustration of the problems
16-L15	Solved and exercise problems.
17-L16	Introduction of Graphical method.
18-L17	Non-negative constrains and constrains of the form ax_1+ax_2
19-L18	Optimizing objective function and its methods.
20-L19	Solved problems in Graphical method.
21-L20	Exercise problems in Graphical method.
22-L21	Introduction of Simplex method.

23-L22	Steps to solve simplex method. - **Allotting portion for Internal Test-I**
	Internal Test I begins (22.01.2018)
24-L23	Solved and exercise problems using simplex method.
25-L24	Problems based on unbounded solutions.
26-IT-1	**Internal Test-I**
27-L25	UNIT-II Introduction of Big M-method.
28-L26	Examples for the Big M- method.
29-L27	Algorithm for Big M- method.
30-L28	Solved problems in Big M- method. - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Exercise problems in Big M- method.
32- L30	Problems in Big M- method.
33- L31	Introduction to Two phase method
34-P2	**College level meeting/Cell function**
35- L32	Problems based on phase –I methods
36- L33	Problems based on phase – II methods.
37- L34	Exercise and Solved problems in 2-phase method.
38- L35	Applications of simplex method.
39- L36	Solution of simultaneous linear equations for simplex method.
40- L37	Problems based on it
41- L38	Inverting a non-singular matrix by simplex method
42- L39	Problems based on it.
43- L40	Introduction of Primal and dual.
44- L41	Lemma and remarks.
45- L42	Fundamental theorem of Duality.
46- L43	Algorithm of Dual Simplex method.
47- L44	Problems based on it.
48- L45	UNIT- III Introduction of Transportation problems.
49- L46	Mathematical formulation and Definition of TP
50- L47	Remark and Theorems in TP
51- P3	**Department Seminar**
52- L48	Dual of a Transportation problem.
53- L49	Solution algorithm for Transportation problem.
54- L50	Algorithm of North West Corner rule.
55- L51	Problems on North West Corner rule.
56-L52	Algorithm of Row Minima Method- **Allotting portion for Internal Test-II**
	Internal Test II begins (26.02.2018)
57-L53	Problems on Row Minima Method
58-L54	Algorithm of Column Minima Method
59-IT-II	**Internal Test-II**
60- L55	Problems on Column Minima Method
61- L56	Algorithm of Least Cost Method. - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems on least cost method.
63- L58	Algorithm of Vogel Approximation method.
64- L59	Problems on Vogel Approximation method.
65- L60	Determiningthe entering and leaving variable.

66- L61	Degeneracy in TP and MODI method.
67- L62	Problems based on MODI method.
68- L63	**UNIT-IV** Introducation of Assignment Problem
69- L64	Mathematical formulation and solution to assignment problem
70- L65	Hungarian Algorithm for solving Assignment problems
71- L66	Exercise and problems in Assignment problems
72- L67	Theorems and problems in Assignment problems
73- L68	UNIT-V Introduction to sequencing.
74-P4	**College level meeting/ function**
75- L69	Introduction of processing Jobs in 2 machine
76- L70	Algorithm and problems based on it.
77- L71	Introduction of processing n Jobs in m machine.
78- L72	Algorithm and problems based on it.
79- L73	Introduction of processing 2 jobs in ma machine. - **Allotting portion for Internal Test-III**
	Internal Test III begins (01.04.2018)
80- L74	Introduction of Graphical method
81- L75	Algorithm on Graphical method
82-IT-III	**Internal Test-III**
83- L76	Problems on Graphical method
84- L77	Exercise and problems - **Test Paper distribution and result analysis**
85- L78	Exercise and problems on Graphical method.
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course Linear Programming Problems
CO1	Enable the students to solve real life problems in Business Management.
CO2	Formulate Linear Programming Problem (LPP), find its solution by graphical method and identify the special cases of solution.
CO3	Predict solutions of different types of LPP using appropriate methods, namely, simplex, Big M and two-phase method.
CO4	Exploit the concept of dual simplex method and solve LPP.
CO5	Solve transportation and assignment problems using primal dual algorithm and extend it for special cases.
CO6	Propose the best strategy in a game using different decision making tools.

CO7	Demonstrate the use of simplex method in analyzing the sensitivity of the optimal solution in terms of change in the cost vector/ requirement vector/coefficient matrix/addition or deletion of variable.
CO8	Get interest in Management studies

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	MECHANICS
Course Code	**GMMA63**
Class	III year (2017-2018)
Semester	Even
Staff Name	S SHYMLALA MALINI
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The course mainly deals with two major areas of applied mathematics namely Statics and Dynamics. Statics is the branch of mechanics that is concerned with the analysis of loads (force and torque, or "moment") acting on physical systems that do not experience an acceleration (a=0), but rather, are in static equilibrium with their environment. Whereas the dynamics is a branch of applied mathematics (specifically classical mechanics) concerned with the study of forces and torques and their effect on motion. Brief introduction to central forces to the learners becomes essential as we live in the era of satellites, missiles and space explorations.

Syllabus

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: Sections10.1, 10.2)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07.12.2017
1-L1	UNIT – I Introduction
2-L2	Forces acting at a point
3- L3	Parallelogram law of forces
4-L4	Exercise Problems 1,2
5-L5	Triangle of forces
6-L6	The polygon of forces
7-L7	Lami's theorem
8-L8	Exercise Problems
9-L9	Find the resultant of any number of coplanar places
10-P1	**Inauguration of Mathematics Association**
11-L10	Parallel forces & moments
12-L11	Unit of moment &Valigen's theorem
13-L12	Exercise problems 1,2
14-L13	Moment of a force about on axis
15-L14	Unit – II Equilibrium of forces
16-L15	Equilibrium of three forces acting on a rigid body
17-L16	Coplanar forces
18-L17	Trignometrical theorems
19-L18	Example problem 1 , 2
20-L19	Friction laws of friction
21-L20	Coefficient and Angle of friction
22-L21	Equilibrium of a particle on a inclined plane

23-L22	Equilibrium of a particle on a inclined plane under a parallel force - **Allotting portion for Internal Test-I**
	Internal Test I begins(22.01.2018)
24-L23	Equilibrium of a body on a inclined plane under any force
25-L24	Exercise problem 3, 4
26-IT-1	**Internal Test-I**
27-L25	Problems of parallel forces
28-L26	Unit – III Projectiles introduction
29-L27	Definitions and fundamental principles
30-L28	Show that the path of the projectile is parabola -**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Characteristics of the motion of the projectile
32- L30	Worked examples 1,2
33- L31	Determine the horizontal range of a projectile
34-P2	**College level meeting/Cell function**
35- L32	Velocity of the projectile at time t
36- L33	Example problem 40, 42
37- L34	Range on an inclined plane
38- L35	Range on an inclined plane is maximum
39- L36	Time of flight
40- L37	Greatest distance S of the projectile from the inclined plane
41- L38	Time taken to reach the greatest distance
42- L39	Initial velocity of projection
43- L40	Example problems 43, 44
44- L41	Enveloping parabola
45- L42	Exercise problems 1, 2
46- L43	Unit – IV Simple harmonic motion
47- L44	SHM in a straight line
48- L45	General solution of the SHM
49- L46	Geometrical representation of SHM
50- L47	Example problem 1, 2
51- P3	**Department Seminar**
52- L48	Composition of 2 SHM of the same period in a straight line
53- L49	Composition of 2 SHM of the same period in a directions
54- L50	Example problem 22, 23
55- L51	SHM on a curve
56-L52	Period of oscillation of a simple pendulum - **Allotting portion for Internal Test-II**
	Internal Test II begins(26.02.2018)
57-L53	Simple equivalent pendulum
58-L54	Seconds pendulum
59-IT-II	**Internal Test-II**
60- L55	Loss or gain of oscillation made by a pendulum
61- L56	Example problem 27, 28 - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Unit – V motion under the action of central forces

63- L58	Velocity and acceleration in polar co-ordinates
64- L59	Example problem 1,2
65- L60	Differential equation of central orbit in polar co-ordinates
66- L61	Perpendicular from the pole on the tangent
67- L62	Pedal equation of the central orbit
68- L63	Pedal equation of standard curves
69- L64	Example problem 13, 14
70- L65	Velocities in a central orbit
71- L66	Two fold problems in central orbits
72- L67	Example problems 15, 16
73- L68	Apses and apsidal distance
74-P4	**College level meeting/ function**
75- L69	Law of the inverse square
76- L70	Example problems 34,35
77- L71	Law of the inverse principle
78- L72	SHM in a straight angle
79- L73	General solution of the SHM - **Allotting portion for Internal Test-III**
	Internal Test III begins (01.04.2018)
80- L74	Geometrical representation of SHM law
81- L75	Apses and apsidal distance
82-IT-III	**Internal Test-III**
83- L76	Two fold problems in central orbits
84- L77	Solved problems - **Test Paper distribution and result analysis**
85- L78	Exercise problems
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test12-04-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course Mechanics
CO1	Learners will gain knowledge about Mechanics of particle and Mechanics of a system of particles with constraints.
CO2	Acquisition of knowledge about D'Alembert's Principle, Lagrange's equation and Hamilton's Principle.
CO3	Outline basics that are governing system of forces.
CO4	explain the idea of couples and illustrate equilibrium of three forces acting on a rigid body in appropriate physical systems. .
CO5	Examine resultant of coplanar forces under various circumstances. Define and apply the concept of friction

CO6	Define principles of conservation of momentum and apply the concept of direct impact and oblique impact in collision of objects.
CO7	Describe the orbit of a moving particle under the action of central forces and compute moment of inertia.
CO8	Enable the students with the basic knowledge of equilibrium of a particle. Enable the students to develop a working knowledge to handle practical problems.
CO9	Knowledge gained about one-body problem, the virial theorem and the Kepler problem.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Graph Theory
Course Code	**GMMA64**
Class	III year (2017-2018)
Semester	Even
Staff Name	G.S.GRACE PREMA G.JEYA KUMAR
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- A graph is a symbolic representation of a network and of its connectivity. It implies an abstraction of the reality so it can be simplified as a set of linked nodes. Graph theory is a branch of mathematics concerned about how networks can be encoded and their properties measured. It has been enriched in the last decades by growing influences from studies of social and complex networks. The origins of graph theory can be traced to Leonhard Euler who devised in 1735 a problem that came to be known as the "Seven Bridges of Konigsberg".

Syllabus

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: Sections10.1, 10.2)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Unit-1 Introduction
2-L2	Definitions and examples of Graph
3- L3	Degrees
4-L4	Problems
5-L5	Sub graphs
6-L6	Spanning sub graph
7-L7	Definitions and examples of spanning sub graph
8-L8	Isomorphism
9-L9	Definitions of automorphism and remark
10-P1	**Inauguration of Mathematics Association**
11-L10	Ulam's conjecture and problems
12-L11	Ramsey numbers
13-L12	Problems of Ramsey number
14-L13	Independent sets and coverings
15-L14	Intersection graphs and line graphs
16-L15	Matrices
17-L16	Operations on graphs
18-L17	Unit-2 Degree sequence
19-L18	Examples and problems
20-L19	Graphic sequences
21-L20	Definition and theorem
22-L21	Algorithm and theorem
23-L22	Definition- walk, trails and paths- **Allotting portion for Internal Test-I**
	Internal Test I begins (22-01-2018)
24-L23	Length of the walk and examples
25-L24	Theorems
26-IT-1	**Internal Test-I**
27-L25	Connected- definition and examples

28-L26	Connectedness related theorems
29-L27	Bipartite-Definition and theorems
30-L28	Definition of cut point, disconnected graph, Bridge - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Blocks- Definitions related examples
32- L30	Theorems on Blocks
33- L31	Definition of connectivity and examples
34-P2	**College level meeting/Cell function**
35- L32	Definition of n-connected, n-line connected
36- L33	Problems related k-connected graph
37- L34	Problems in k-connected graph
38- L35	Problems in k-connected graph
39- L36	Book back one words
40- L37	Unit-3 Introduction
41- L38	Definition of Eulerian and lemma
42- L39	Eulerian related theorem and corollary
43- L40	Fleury's algorithm
44-L41	Definition – Hamiltonian cycle
45- L42	Hamiltonian graph and examples
46- L43	Definition-theta graph and theorems
47- L44	Theorem –Necessary condition for a graph to be Hamiltonian
48- L45	Dirac 's theorem
49- L46	Problems for non-Hamiltonian
50- L47	Definition-Acyclic graph, Tree, examples
51- P3	**Department Seminar**
52- L48	Theorems related to tree
53- L49	Definition – spanning tree and theorem
54- L50	Definition- Eccentricity, radius r(G), examples
55- L51	Definitions-centres of G, and theorems
56-L52	Book back one word- **Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
57-L53	Unit-4 Definition- planarity and example
58-L54	Definition – Non planar and theorem
59-IT-II	**Internal Test-II**
60- L55	Theorems related to embedding plane
61- L56	Theorems-Euler's polyhedron formula- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Corollary related to plane graph
63- L58	Definition- Maximal planar, corollary
64- L59	Definition- Elementary subdivision, Homeomorphic and examples
65- L60	Problems related to homeomorphic
66- L61	Definition- Colourability, example, chromatic numb
67- L62	Definition- Chromatic partitioning, examples
68- L63	Definition- uniquely colourable, theorems
69- L64	Definition- Edge colouring, Edge chromatic number
70- L65	Theorem related to edge chromatic number

71- L66	Unit-5 Five Colour theorem
72- L67	Chromatic polynomials , theorem
73- L68	Problems related to chromatic polynomial
74-P4	**College level meeting/function**
75- L69	Definition- Directed graph, Indegree
76- L70	Definition- Isomorphism and Directed walk
77- L71	Examples
78- L72	Definitions- length, directed cycle
79- L73	Definitions- **Allotting portion for Internal Test-III (01-04-2018)**
	Internal Test III begins01-04-2018
80- L74	Definitions- reachable, unilateral
81- L75	Definition- Strongly connected and theorem
82-IT-III	**Internal Test-III**
83- L76	Definition- Eulerian trail, Eulerian
84- L77	Theorem related to Eulerian - **Test Paper distribution and result analysis**
85- L78	Definition- Eulerian trail, Eulerian
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (12-04-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course Graph Theory
CO1	Demonstrate graphs with examples and represent a graph by matrices.
CO2	Identify and construct Eulerian and Hamiltonian graphs.
CO3	Describe the properties of trees and able to examine minimal spanning tree for a given weighted graph.
CO4	discuss colouring concept of vertices and edges of a graph
CO5	Analyze planar graphs and its properties, and classify the connectedness of directed graph.
CO6	Gain the skills to apply the theory to solve various mathematical problems.
CO7	Have an in-depth knowledge of colouring and planarity.
CO8	Know the methods of representing networks in computer science and other fields.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B.Sc Mathematics
Course Name	Abstract Algebra
Course Code	**JMMA41**
Class	II year (2017-2018)
Semester	Even
Staff Name	Mrs. S.Vijila Velvet Daisy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the concept of Groups ,Ring and Field.
- To study the concept of homomorphism

Syllabus

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 IIINormal 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:
1) Arumugam .S and Tangapandi Issac .A – “Modern Algebra”scitech publications Pvt. Ltd.

Books for Reference :
1) Anton .H and C. Rorres - Elementary Linear Algebra (9th Edn) John Wiley and Sons, Inc., New York 2005.
2) Manicavasagam Pillai .T.K and others – Modern Algebra, S. Viswanathan Publishers, Chennai 1993.
3) Herstein .I.N – Topics in Algebra, Vikas Publishing Pvt. Ltd. 1975, New Delhi.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Introduction
2-L2	Groups
3- L3	Groups
4-L4	definition and Examples
5-L5	Subgroup
6-L6	order of an element
7-L7	order of an element
8-L8	centre of a group
9-L9	Normalizer and centralizer. Product of two subgroups
10-P1	**Inauguration of Mathematics Association**
11-L10	Normalizer and centralizer. Product of two subgroups
12-L11	order of HK
13-L12	Intersection and union of subgroups.
14-L13	Intersection and union of subgroups.
15-L14	Cyclic groups
16-L15	Cyclic groups
17-L16	generators of a cyclic group
18-L17	generators of a cyclic group
19-L18	Number of generators of a cyclic groups
20-L19	Number of generators of a cyclic groups
21-L20	Cosets
22-L21	Partitioning of a group by Cosets
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**

	Internal Test I begins22-01-2018
24-L23	Partitioning of a group by Cosets
25-L24	Lagrange"s theorem
26-IT-1	**Internal Test-I**
27-L25	Euler"s theorem
28-L26	Fermat"s theorem.
29-L27	Quotient groups
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Quotient groups
32- L30	Group Homomorphis
33- L31	Canonical homomorphism
34-P2	**College level meeting/Cell function**
35- L32	Canonical homomorphism
36- L33	kernel of a homomorphism
37- L34	kernel of a homomorphism
38- L35	Isomorphism
39- L36	Isomorphism
40- L37	Automorphism
41- L38	Automorphism
42- L39	Inner automorphism
43- L40	Inner automorphism
44- L41	Permutation groups
45- L42	Permutation groups
46- L43	Cayley"s theorem.
47- L44	Cayley" s theorem.
48- L45	Definition and examples
49- L46	Types of rings
50- L47	Types of rings
51- P3	**Department Seminar**
52- L48	Elementary properties of a ring
53- L49	Elementary properties of a ring
54- L50	Integral domain
55- L51	Field
56-L52	Problem Discussion - **Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
57-L53	Sub rings
58-L54	Subfields
59-IT-II	**Internal Test-II**
60- L55	Subfields
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Ideals
63- L58	Ideals
64- L59	Principal ideal
65- L60	quotient ring
66- L61	Maximal and prime ideals
67- L62	Maximal and prime ideals

68- L63	characteristic of a ring
69- L64	characteristic of a ring
70- L65	PID – UFD
71- L66	Homomorphism of rings
72- L67	Homomorphism of rings
73- L68	Isomorphism
74-P4	**College level meeting/ function**
75- L69	kernel of a homomorphism
76- L70	Fundamental theorem
77- L71	Fundamental theorem
78- L72	Field of quotients of an integral domain
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
80- L74	polynomial rings
81- L75	polynomial rings
82-IT-III	**Internal Test-III**
83- L76	Division algorithm
84- L77	**Test Paper distribution and result analysis**
85- L78	Division algorithm
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (12-04-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Abstract Algebra”
CO1	Acquire knowledge on the concept of Groups, Ring and Field.
CO2	Gaining knowledge on the concept of homomorphism.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Trigonometry, Laplace Transforms and Fourier Series
Course Code	**JSMA4A**
Class	II year (2017-2018)
Semester	Even
Staff Name	Dr. A.Alwyn Asir
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To understand the concept of Trigonometry
- To know the concept of Laplace transform
- To study the concept of Fourier series

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Introduction
2-L2	Expansions of sin nx, cos nx expansion
3- L3	Expansions of sin nx, cos nx expansion
4-L4	tan nx and expansions of sinnx & cosnx
5-L5	tan nx and expansions of sinnx & cosnx
6-L6	Hyperbolic functions
7-L7	Hyperbolic functions
8- P1	**Inauguration of Mathematics Association**
9- L8	Relations between hyperbolic functions and circular functions
10- L9	Relations between hyperbolic functions and circular functions
11-L10	Inverse hyperbolic functions
12-L11	Inverse hyperbolic functions
13-L12	Logarithm of complex numbers
14-L13	Logarithm of complex numbers
15-L14	Problem discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	Logarithm of complex numbers
17-IT-1	**Internal Test-I**
18-L16	Logarithm of complex numbers
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Summation of series by C + iS method
21- L19	Summation of series by C + iS method.
22- P2	**College level meeting/Cell function**
23-L20	Laplace Transforms
24-L21	Laplace Transforms

25-L22	Inverse Laplace Transforms
26-L23	Inverse Laplace Transforms
27-L24	Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms.
28-L25	Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms.
29-L26	Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms.
30-L27	Fourier Series
31-L28	Fourier Series
32-L29	Definition
33-L30	Definition
34- P3	**Department Seminar**
35-L31	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
36-L32	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
38- IT-II	**Internal Test-II**
39-L34	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Odd and even functions
42- L37	Odd and even functions
43- L38	Odd and even functions
44- P4	**College level meeting/ function**
45-L39	Half range series
46-L40	Half range series
47-L41	Half range series
48-L42	Revesion
49-L43	Revesion
50-L44	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	Problem Discussion
52- L46	Problem Discussion
53-IT-III	**Internal Test-III**
54-L47	Revesion
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test (12-04-2018)**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	COs of the course “Trigonometry, Laplace Transforms and Fourier Series”
CO1	Enable the students to understand the concept of Trigonometry.
CO2	Gaining knowledge on the concept of Laplace transform.
CO3	Learners will know about the concept of Fourier series.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Operations Research-II
Course Code	**SMMA6D**
Class	III year (2017-2018)
Semester	Even
Staff Name	Dr. J. Subhashini
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives:

- To introduce Games and strategies
- To understand networking problems
- To make the students solve real life problems in business and management

Syllabus

OPERATIONS RESEARCH-II (60 Hours)

Unit I Games and Strategies : Two Person Zero sum Games – The Maximin – Minimax Principle – Games without Saddle Points – Mixed Strategies – Graphical Solution of2xnandmx2games–DominanceProperty **12L**

Unit II Replacement of items that deteriorate with time-replacement age of a machine taking money value into consideration-replacement of items that completely fail suddenyandStaffingProblems **13L**

Unit III Queing models : General concept and definitions-characteristics-properties of Poisson process Models(M/M/1: **/**FCFS), (M/M/1 : N/FCFS),(M/M/S : /FCFS) **11L**

Unit IV Network scheduling by PERT / CPM : Network and basic components – Rules of Network Construction – Time Calculation in network – Critical Path Method – PERTCalculation. **13L**

Unit V Inventory Control : Introductions – Types of Inventories – Inventory decisions – Deterministic inventory Problem– EOQ problems with shortages. **13L**

Text Book:

• KantiSwarup, P.K. Gupta and Manmohan – Operations Research – Sultan Chand & Sons – 2006, 12th edition.

Books for Reference :

• Gupta .P.K and D.S. Hira – Operations Research – S. Chand and Company.

• B.J. Ranganath and A.S.Srikantappa -Operations Research, Yesdee Publishing House,Chennai(2017)

• Hillier, F.S. and G.J. Lieberman - Introduction to Operations Research, 9th Ed., Tata McGrawHill, Singapore, 2009.

• Hamdy A. Taha, - Operations Research, An Introduction, 8th Ed., Prentice – Hall India, 2006.

. Hadley .G. - Linear Programming, Narosa Publishing House, New Delhi, 2002

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2018
1-L1	Unit-I Introduction
2-L2	**Games and Strategies :** Two Person Zero sum Games
3- L3	Two Person Zero sum Games
4-L4	The Maximin-Minimax Principle
5-L5	Games without Saddle Points
6-L6	Mixed Strategies
7-L7	Graphical Solution of2xnandmx2games
8- P1	**Inauguration of Mathematics Association**
9- L8	DominanceProperty
10- L9	Unit-II Introduction
11-L10	Replacementof items that deteriorate with time
12-L11	replacement age of a machine taking money value into consideration
13-L12	replacement age of a machine taking money value into consideration
14-L13	replacement of items that completely fail suddeny
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	replacement of items that completely fail suddeny
17-IT-1	**Internal Test-I**
18-L16	Staffing Problems
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal

20-L18	Staffing Problems
21- L19	Unit-III Introduction
22- P2	**College level meeting/Cell function**
23-L20	**Queing models :**General concept and definitions
24-L21	characteristics
25-L22	properties of Poisson process Models (M/M/1: /FCFS)
26-L23	properties of Poisson process Models (M/M/1 : N/FCFS)
27-L24	properties of Poisson process Models (M/M/S : /FCFS)
28-L25	Unit-IV Introduction
29-L26	**Network scheduling by PERT / CPM :** Network and basic components
30-L27	Rules of Network Construction
31-L28	Time Calculation in network
32-L29	Time Calculation in network
33-L30	Critical Path Method
34- P3	**Department Seminar**
35-L31	Critical Path Method
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	PERT Calculation.
38- IT-II	**Internal Test-II**
39-L34	Unit-V Introduction
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	**Inventory Control :** Introductions
42- L37	Types of Inventories
43- L38	Inventory decisions
44- P4	**College level meeting/ function**
45-L39	Deterministic inventory Problem
46-L40	Deterministic inventory Problem
47-L41	EOQ problems with shortage
48-L42	EOQ problems with shortage
49-L43	EOQ problems with shortage
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	Deterministic inventory Problem
52- L46	EOQ problems with shortage
53-IT-III	**Internal Test-III**
54-L47	EOQ problems with shortage
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Operations Research-II>”
CO1	Students get introduced to Games and strategies.
CO2	Enable the students to understand networking problems.
CO3	Enable the students to solve real life problems in business and management.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	For Science Students
Course Name	Vector Calculus & Fourier Series
Course Code	**SAMA21**
Class	I year (2017-2018)
Semester	Even
Staff Name	Mrs.S.Shyamala Malini
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

Vector Calculus & Fourier Series (90 Hours)

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.
Text Books:

- Dr. S. Arumugam & others – Vector Calculus

- T.K. Manicavachagom Pillai – Calculus (Vol II)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Vector differentiation
3- L3	Vector differentiation
4-L4	Vector differentiation

5-L5	Gradient
6-L6	Gradient
7-L7	Gradient
8-L8	Gradient
9-L9	Divergence and curl
10-P1	**Inauguration of Mathematics Association**
11-L10	Divergence and curl
12-L11	Divergence and curl
13-L12	Divergence and curl
14-L13	Unit-II Introduction
15-L14	Evaluation of double integrals
16-L15	Evaluation of double integrals
17-L16	Evaluation of double integrals
18-L17	Evaluation of double integrals
19-L18	Evaluation of triple integrals
20-L19	Evaluation of triple integrals
21-L20	Evaluation of triple integrals
22-L21	Evaluation of triple integrals
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins 22-01-2018
24-L23	Unit-III Introduction
25-L24	Vector integration
26-IT-1	**Internal Test-I**
27-L25	Vector integration
28-L26	Vector integration
29-L27	Vector integration
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Lineintegrals
32- L30	Line integrals
33- L31	Line integrals
34-P2	**College level meeting/Cell function**
35- L32	surface integrals
36- L33	surface integrals
37- L34	surface integrals
38- L35	volume integrals
39- L36	volume integrals
40- L37	volume integrals
41- L38	Unit-IV Introduction
42- L39	Green’s theorem
43- L40	Stokes theorem
44- L41	Divergence theorem
45- L42	simple problems
46- L43	simple problems
47- L44	simple problems
48- L45	simple problems
49- L46	simple problems
50- L47	simple problems

51- P3	**Department Seminar**
52- L48	simple problems
53- L49	simple problems
54- L50	simple problems
55- L51	Unit-V Introduction
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins 26-02-2018
57-L53	Fourier series
58-L54	Fourier series
59-IT-II	**Internal Test-II**
60- L55	Fourier series
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Fourier series
63- L58	Fourier series
64- L59	Fourier series
65- L60	Even functions
66- L61	Even functions
67- L62	Even functions
68- L63	Even functions
69- L64	Even functions
70- L65	Oddfunctions
71- L66	Odd functions
72- L67	Odd functions
73- L68	Odd functions
74-P4	**College level meeting/ function**
75- L69	Odd functions
76- L70	Odd functions
77- L71	Odd functions
78- L72	Odd functions
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins 01-04-2018
80- L74	Evaluation of double integrals
81- L75	Evaluation of triple integrals
82-IT-III	**Internal Test-III**
83- L76	Evaluation of triple integrals
84- L77	**Test Paper distribution and result analysis**
85- L78	Evaluation of double integrals
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 12-04-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	COs of the course “<Vector Calculus & Fourier Series>”
CO1	Acquiring knowledge on vector differentiation and vector integration
CO2	Gaining knowledge on evaluation of double & triple integrals.
CO3	Know about Green’s, Stokes and Divergence theorem.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Fuzzy Mathematics
Course Code	**SMMA6B**
Class	III year (2017-2018)
Semester	Even
Staff Name	Dr. J. Subhashini
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To introduce fuzzy concepts to students
- To facilitate the students to study fuzzy operations and fuzzy numbers

Syllabus

FUZZY MATHEMATICS (60 Hours)

Unit I Crisp Sets – Fuzzy Sets – Basic Types – Basic Concepts – Characteristics and Significance of the Paradigm shift. **11L**

Unit II Additional properties of α-cuts – representations of fuzzy sets – Extension principle for fuzzy sets**. 13L**

Unit III Fuzzy set operations – Fuzzy complements – Fuzzy intersections : t-norms – Fuzzy Unions : t-conorms – Combinations of operations – Aggregation operations. **11L**

Unit IV Fuzzy Numbers – Linguistic variables – Arithmetic operations on intervals – Arithmetic operations of fuzzy numbers – Lattice of fuzzy numbers – Fuzzy Equations. **13L**

Unit V Fuzzy Decision Making – Individual Decision Making – Multi-person decision making – Fuzzy linear Programming. **12L**

Text Book:

• George J. Klir and Bo Bo Yuan – Fuzzy sets and Fuzzy Logic Theory Applications, Prentice Hall of India, 2002, New Delhi.

Book for Reference:

• George J. Klir and Tina .A Folger – Fuzzy sets, uncertainty and Informations – Prentice Hall of India, 2003, New Delhi.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Crisp Sets
3- L3	Fuzzy Sets
4-L4	Basic Types
5-L5	Basic Concepts
6-L6	Characteristics of the Paradigm shift.
7-L7	Significance of the Paradigm shift.
8- P1	**Inauguration of Mathematics Association**
9- L8	Unit-II Introduction
10- L9	Additional properties of α-cuts
11-L10	Additional properties of α-cuts
12-L11	representations of fuzzy sets
13-L12	representations of fuzzy sets
14-L13	Extension principle for fuzzy sets
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	Extension principle for fuzzy sets
17-IT-1	**Internal Test-I**
18-L16	Extension principle for fuzzy sets
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Unit-III Introduction
21- L19	Fuzzy set operations
22- P2	**College level meeting/Cell function**
23-L20	Fuzzy complements
24-L21	Fuzzy intersections: t-norms
25-L22	Fuzzy Unions: t-conorms
26-L23	Combinations of operations
27-L24	Aggregation operations
28-L25	Unit-IV Introduction
29-L26	Fuzzy Numbers

30-L27	Linguistic variables
31-L28	Arithmetic operations on intervals
32-L29	Arithmetic operations of fuzzy numbers
33-L30	Arithmetic operations of fuzzy numbers
34- P3	**Department Seminar**
35-L31	Lattice of fuzzy numbers
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	Fuzzy Equations.
38- IT-II	**Internal Test-II**
39-L34	Unit-V Introduction
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Fuzzy Decision Making
42- L37	Fuzzy Decision Making
43- L38	Individual Decision Making
44- P4	**College level meeting/ function**
45-L39	Multi-person decision making
46-L40	Multi-person decision making
47-L41	Fuzzy linear Programming
48-L42	Fuzzy linear Programming
49-L43	Fuzzy linear Programming
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	Fuzzy linear Programming
52- L46	Fuzzy linear Programming
53-IT-III	**Internal Test-III**
54-L47	Fuzzy linear Programming
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Fuzzy Mathematics>”
CO1	Acquire basic knowledge on fuzzy concepts to students.
CO2	Facilitate the students to study fuzzy operations and

	fuzzy numbers.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature　　　　　　　　　　　　　　　　　　　　　　　　Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Differential Equations
Course Code	**SMMA22**
Class	I year (2017-2018)
Semester	Even
Staff Name	Miss. C. Henrietta Johnsy
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Identify the type of a given differential equations and select and apply the appropriate analytical technique for finding the solution of first order abd selected higher order ODE
- Evaluate first order differential equations including separable, homogeneous, exact and linear.
- Solve linear systems of ordinary differential equations
- Solve differential equations using variation of parameters.

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Core - 4

DIFFERENTIAL EQUATIONS : (75 Hours)

Unit I First order higher degree equations – solvable for x,y,p and Clairaut's form – Simultaneous differential equations of the form f1(D)x+ g1(D)y = h1(t), f2(D) x + g2(D)y = h2(t)

Unit II (Ordinary differential equation) Second order linear differential equations with constant coefficients – Find the P.I for functions of the form ea*x*f(*x*) and *x*nf(*x*)

Unit III Linear equations of second order with variable coefficients – Homogeneous equations – Equation reducible to homogeneous equation.

Unit IV (Partial differential equations) Formation of equations by elimination of arbitrary constants and functions – Definition of general, particular and complete solutions – solving standard forms f(p,q) = 0, f(*x*, p, q) = 0, f(y, p, q) = 0, f(z, p, q) = 0, f(*x*, p) = f(y, q), z = p*x* + qy + f(p,q) – Lagrange's differential equations Pp + Qq= R

Unit V Application of differential equations – Growth and Decay – chemical reaction – Newton's law of cooling – Brochistocrone problem – simple electric circuits.

Text Book: Narayanan .S and T.K. Manickavachagam Pillai – Differential equations and its applications, 2003 – S. Viswanathan Printers.

Books for Reference :

• Kandasamy .P and K. Thilagavathi– Mathematics for B.Sc., Vol. III – 2004 – S.Chand and Co., New Delhi.

• Braun .M. – Differential Equations and their applications (III edition) Springer – Verlag, New York 1983)

• Boyce .W.E and R.C. Diprima – Elementary differential equations and Boundary value Problems (VII editions) – John Wiley and Sons, Inc, New York 2001.

• Sankaranarayan and Manguldoss – Differential Equations.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	First order higher degree equations
3- L3	First order higher degree equations
4-L4	First order higher degree equations
5-L5	solvable for p, x, y and Clairaut's form
6-L6	solvable for p, x, y and Clairaut's form
7-L7	solvable for p, x, y and Clairaut's form
8- P1	**Inauguration of Mathematics Association**

9- L8	Simultaneous differential equations of the form f1(D)x+ g1(D)y = h1(t), f2(D) x + g2(D)y = h2(t)
10- L9	Simultaneous differential equations of the form f1(D)x+ g1(D)y = h1(t), f2(D) x + g2(D)y = h2(t)
11-L10	Simultaneous differential equations of the form f1(D)x+ g1(D)y = h1(t), f2(D) x + g2(D)y = h2(t)
12-L11	Simultaneous differential equations of the form f1(D)x+ g1(D)y = h1(t), f2(D) x + g2(D)y = h2(t)
13-L12	Unit-II Introduction
14-L13	Linear differential equations of second order with constant coefficients
15-L14	Linear differential equations of second order with constant coefficients
16-L15	Linear differential equations of second order with constant coefficients
17- L16	Linear differential equations of second order with constant coefficients
18- L17	Linear differential equations of second order with constant coefficients
19- L18	Find the P.I for functions of the form ea$x$f(x) and $x$nf(x)
20- L19	Find the P.I for functions of the form ea$x$f(x) and $x$nf(x)
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
22- L21	Find the P.I for functions of the form ea$x$f(x) and $x$nf(x)
23- IT-1	Find the P.I for functions of the form ea$x$f(x) and $x$nf(x)
24- L22	Find the P.I for functions of the form ea$x$f(x) and $x$nf(x)
25- L23	Find the P.I for functions of the form ea$x$f(x) and $x$nf(x)
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Unit-III Introduction
28- L26	Linear differential equation of second order with variable coefficients
29- L27	Linear differential equation of second order with variable coefficients
30- P2	**College level meeting/Cell function**
31-L28	Linear differential equation of second order with variable coefficients
32-L29	homogeneous equations
33-L30	homogeneous equations
34- L31	homogeneous equations
35- L32	homogeneous equations
36- L33	equation reducible to homogeneous equations
37- L34	equation reducible to homogeneous equations
38- L35	equation reducible to homogeneous equations
39- L36	Unit-IV Introduction
40- L37	Formation of equations by elimination of arbitrary constants and functions
41- L38	Formation of equations by elimination of arbitrary constants and functions
42-P3	**Department Seminar**
43- L39	Formation of equations by elimination of arbitrary constants and functions
44- L40	Definition of general, particular and complete solutions
45- L41	Definition of general, particular and complete solutions
46- L42	Definition of general, particular and complete solutions
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
48- L44	Solving standard forms f(p,q) = 0, f(x, p, q) = 0, f(y, p, q) = 0, f(z, p, q) = 0, f(x, p) = f(y, q), z = px + qy + f(p,q)

49-IT-II	**Internal Test-II**
50-L45	Lagrange's differential equations Pp + Qq= R
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Definition of general, particular and complete solutions
53- L48	Definition of general, particular and complete solutions
54- L49	Application of differential equations
55- L50	Application of differential equations
56- L51	Growth and Decay
57- L52	Growth and Decay
58- L53	Chemical reaction
59-P4	**College level meeting/ function**
60- L54	Newton's law of cooling
61- L55	Newton's law of cooling
62- L56	Brochistocrone problem
63- L57	Simple electric circuits
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
65- L59	Simple electric circuits
66- L60	Simple electric circuits
67-IT-III	**Internal Test-III**
68- L61	Brochistocrone problem
69- L62	Simple electric circuits
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test12-04-2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**Cos** of the course "<Differential Equations>"
CO1	Enables the students to learn the method of solving Differential Equations. Objectives: End of this course, the students should gain the knowledge about the method of solving Differential Equations.
CO2	It also exposes Differential Equation as a powerful tool in solving problems in Physical and Social sciences

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B Sc Mathematics
Course Name	Analytic Geometry of three dimensions
Course Code	**SMMA21**
Class	I year (2017-2018)
Semester	Even
Staff Name	1)Dr. A. Alwyn Asir
	2)Dr. J. Subhashini
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To describe the objects in three dimensions using coordinate system
- To gain some knowledge about planes in a space
- To know about lines and its properties
- Understanding the structure of spheres and intersections of known objects
- To express cones and cylinder using mathematical equations

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Core-3

ANALYTICAL GEOMETRY OF THREE DIMENSIONS: (75 Hours)

Unit I Analytical Geometry of 3D Co-ordinate system, direction cosines, direction ratios

Unit II Equation of plane in different forms - angle between planes-Length of perpendicular-angle bisection.

Unit III - Equation of a line in different forms - image of a point – image of a line-The plane and the straight line-angle between plane and line-Coplanar lines-Shortest distance between two lines
Unit IV Sphere – Tangent plane – circle of intersections – Tangency of Spheres – coaxial system of spheres - Radical Planes – Orthogonal Spheres.

Unit V Equation of a cone-cone with vertex at the orgin –Tangent plane and normal- Quadratic cone with the vertex at orgin – Right circular cone – Cylinder – Right circular cylinder-enveloping cylinder

Text Book: T.K.Manicavachagom Pillay and T.Natarajan-A text book of Analytical Geometry -Part-II Three Dimensions- S.Viswanathan(Printers&Publishers)Pvt Ltd(2012)

Books for Reference :

• Duraipandian .P. Laxmi Duraipandian and D.Muhilan - Analytical Geometry of Three Dimension - Emerald Publishers.

• Kandasamy .P. and K. Thilagavathi – Mathematics for B.Sc., Vol. IV – 2004 S.Chand and Co. New Delhi.

• Loney .S.L. - The Elements of Coordinate Geometry - Mcmillan and Company London.

• B. Stephen John - Analytical Geometry of 3D and vector differentiation : IDEAL publication.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Analytical Geometry of 3D Co-ordinate system
3- L3	Analytical Geometry of 3D Co-ordinate system
4-L4	Analytical Geometry of 3D Co-ordinate system
5-L5	direction cosines
6-L6	direction cosines
7-L7	direction cosines
8- P1	**Inauguration of Mathematics Association**
9- L8	direction ratios
10- L9	direction ratios
11-L10	direction ratios
12-L11	Unit-II Introduction
13-L12	Equation of plane in different forms
14-L13	Equation of plane in different forms
15-L14	Equation of plane in different forms
16-L15	Angle between planes

17- L16	Angle between planes
18- L17	Angle between planes
19- L18	Length of perpendicular
20- L19	Length of perpendicular
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
22- L21	Angle bisection
23- IT-1	**Internal Test-I**
24- L22	Angle bisection
25- L23	Unit-III Introduction
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Equation of a line in different forms
28- L26	Equation of a line in different forms
29- L27	Image of a point
30- P2	**College level meeting/Cell function**
31-L28	Image of a line
32-L29	The plane and the straight line
33-L30	The plane and the straight line
34- L31	Angle between plane and line
35- L32	Angle between plane and line
36- L33	Angle between plane and line
37- L34	Coplanar lines
38- L35	Coplanar lines
39- L36	Coplanar lines
40- L37	Shortest distance between two lines
41- L38	Shortest distance between two lines
42-P3	**Department Seminar**
43- L39	Shortest distance between two lines
44- L40	Unit-IV Introduction
45- L41	Sphere
46- L42	Tangent plane
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
48- L44	circle of intersections
49-IT-II	**Internal Test-II**
50-L45	Tangency of Spheres
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Coaxial system of spheres
53- L48	Coaxial system of spheres
54- L49	Radical Planes
55- L50	Radical Planes
56- L51	Orthogonal Spheres
57- L52	Orthogonal Spheres
58- L53	Unit-V Introduction
59-P4	**College level meeting/ function**
60- L54	Equation of a cone

61- L55	Equation of a cone
62- L56	Cone with vertex at the orgin
63- L57	Cone with vertex at the orgin
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
65- L59	Tangent plane and normal-Quadratic cone with the vertex at orgin
66- L60	Right circular cone – Cylinder
67-IT-III	**Internal Test-III**
68- L61	Right circular cylinder-Enveloping cylinder
69- L62	Right circular cylinder-Enveloping cylinder
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test12-04-2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Analytic Geometry of three dimensions>”
CO1	Enable the students to learn and visualize the fundamental ideas about co-ordinate geometry.
CO2	On successful completion of the course students should have gained knowledge about the regular geometrical figures and their properties

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Numerical Methods
Course Code	**SMMA65**
Class	III year (2017-2018)
Semester	Even
Staff Name	Dr. J. Vijaya Xavier Parthipan
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To introduce the finite differences
- To solve numerical problems by different methods

Syllabus

NUMERICAL METHODS (60 Hours)

Unit I Solution of Numerical algebraic and Transcendental Equations : bisection method – Newton" s method. Criterion of order of convergence of Newton" s method. Regula False method – Gauss elimination – Gauss Jacobi – Gauss Seidal method **13L**

Unit II Finite Difference : First and higher order differences – Forward and backward differences – Properties of Operator – Differences of a polynomial – Factorial Polynomial **11L**

Unit III Interpolation :Newton" s Forward – backward, Gauss forward – backward interpolation formula – Bessel" s formula. Divided differences – Newton" s divided difference formula – Legrange" s interpolation formule**11L**

Unit IV Numerical Differentation and Integration : Newtons forward and backward differences for differentiation – Derivatives using Bessel" s formula – Trapezoidal rule, simpson" s 1/3 rule & 3/8 rule **13L**

Unit V Difference Equations : Definition – order and degree of difference equation – Linear difference equation – Finding complementary function – particular Integral –simpleapplications. **12L**

Text Book:

• Venkatraman .M.L - Numerical methods in Science and Engineering National Publishing Company V Edition 1998

Books for Reference :

• Kandasamy .P.K. Thilagavathy and K. Gunavathy „Numerical Methods" S. Chand & Company Ltd. Edn. 2006.

• B. Stephen John – Numerical Analysis

• Autar Kaw and Egwwn Enc Kalu - Numerical methods with Application Abidet. Autokaw.com 2nd 2011.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	bisection method
3- L3	bisection method
4-L4	Newton"s method
5-L5	Newton"s method
6-L6	Criterion of order of convergence of Newton"s method
7-L7	Regula False method
8- P1	**Inauguration of Mathematics Association**
9- L8	Regula False method
10- L9	Gauss elimination method
11-L10	Gauss Jacobi method
12-L11	Gauss Seidal method
13-L12	Unit-II Introduction
14-L13	**Finite Difference :**First and higher order differences
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins 22-01-2018
16-L15	Forward and backward differences
17-IT-1	**Internal Test-I**
18-L16	Properties of Operator
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Differences of a polynomial
21- L19	Factorial Polynomial

22- P2	**College level meeting/Cell function**
23-L20	Unit-III Introduction
24-L21	Interpolation : Newton's Forward interpolation formula
25-L22	Newton's Backward interpolation formula
26-L23	Gauss forward interpolation formula
27-L24	Gauss backward interpolation formula
28-L25	Bessel's formula
29-L26	Divided differences
30-L27	Newton's divided difference formula
31-L28	Legrange's interpolation formula
32-L29	Unit-IV Introduction
33-L30	Newtons forward differences for differentiation
34- P3	**Department Seminar**
35-L31	Newtons backward differences for differentiation
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins 26-02-2018
37- L33	Derivatives using Bessel's formula
38- IT-II	**Internal Test-II**
39-L34	Trapezoidal rule
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Simpson's 1/3 rule & 3/8 rule
42- L37	Unit-VIntroduction
43- L38	**Difference Equations :**Definition
44- P4	**College level meeting/ function**
45-L39	order and degree of difference equation
46-L40	Linear difference equation
47-L41	Finding complementary function
48-L42	particular Integral
49-L43	Simple applications.
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins 01-04-2018
51 L45	Simple applications.
52- L46	Simple applications.
53-IT-III	**Internal Test-III**
54-L47	Simple applications.
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test 12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Numerical Methods >”
CO1	Gaining knowledge on the finite differences.
CO2	Enable the students to solve numerical problems by different methods.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Complex Analysis
Course Code	**SMMA61**
Class	III year (2017-2018)
Semester	Even
Staff Name	Miss. C. Henrietta Johnsy
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

Complex analysis, traditionally known as the theory of functions of a complex variable, is the branch of mathematical analysis that investigates functions of complex numbers. It is useful in many branches of mathematics, including algebraic geometry, number theory, analytic combinatorics, applied mathematics; as well as in physics, including hydrodynamics and thermodynamics and also in engineering

Syllabus

COMPLEX ANALYSIS (75 Hours)

Unit I (Analytic functions) Functions of a complex variable – Derivatives – Cauchy – Riemann equations – sufficient conditions – Polar form – Analytic functions – Harmonic functions**. 13L**
Unit II (Integrals) Definite integrals – Contours – Cauchy – Goursat theorem – antiderivatives and independence of path – Cauchy Integral formula – Morera" s theorem. **17L**
Unit III (Series) Taylor" s series – Examples – Laurent" s series – Zeros of analytic functions – Residues – Residue theorem – Principal part of functions – Residues at poles. **16L**

Unit IV (Evaluation of Integrals) Evaluation of improper real integrals – improper integrals involving sines and cosines – Definite integrals involving sines and coines**. 14L**
Unit V (Transformations) Conformal mappings–basic properties–Bilinear maps – fixed points – Applications 1**5L**
Text Book:
• Arumugam.S and T. Issac – "Complex Analysis" – Scitech Publishing House – Chennai
Books for Reference :
• Churchill .R.V. and J.W. Brown – "Complex variables and Applications" – IV edition – McGraw Hill International Editions.

• Ponnuswamy .S – "Foundations of Complex Analysis", Narosa Publication House, New Delhi, II edition 2005.

• Duraipandian .P and Lakshmi Duraipandian – "Complex Analysis" – Emerald Publications, Chennai (2001)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	**(Analytic functions)** Functions of a complex variable
3- L3	Functions of a complex variable
4-L4	Derivatives
5-L5	Derivatives
6-L6	Derivatives
7-L7	Cauchy – Riemann equations
8- P1	**Inauguration of Mathematics Association**
9- L8	Cauchy – Riemann equations
10- L9	sufficient conditions
11-L10	Polar form
12-L11	Polar form
13-L12	Analytic functions
14-L13	Harmonic functions
15-L14	Unit-II Introduction
16-L15	**(Integrals)** Definite integrals
17- L16	Definite integrals
18- L17	Definite integrals
19- L18	Contours theorem
20- L19	Cauchy's theorem
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
22- L21	Goursat's theorem
23- IT-1	**Internal Test-I**
24- L22	antiderivatives
25- L23	antiderivatives

26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	independence of path
28- L26	Cauchy Integral formula
29- L27	Cauchy Integral formula
30- P2	**College level meeting/Cell function**
31-L28	Morera's theorem.
32-L29	Unit-III Introduction
33-L30	**(Series)** Taylor's series
34- L31	Taylor's series
35- L32	Examples
36- L33	Laurent's series
37- L34	Zeros of analytic functions
38- L35	Zeros of analytic functions
39- L36	Residues
40- L37	Residues
41- L38	Residue theorem
42-P3	**Department Seminar**
43- L39	Residue theorem
44- L40	Principal part of functions
45- L41	Principal part of functions
46- L42	Residues at poles
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
48- L44	Residues at poles
49-IT-II	**Internal Test-II**
50-L45	Unit-IV Introduction
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Evaluation of improper real integrals
53- L48	Evaluation of improper real integrals
54- L49	improper integrals involving sines and cosines
55- L50	improper integrals involving sines and cosines
56- L51	Definite integrals involving sines and coines
57- L52	Definite integrals involving sines and coines
58- L53	Unit-V Introduction
59-P4	**College level meeting/ function**
60- L54	**(Transformations)** Conformal mappings
61- L55	Conformal mappings
62- L56	basic properties
63- L57	basic properties
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
65- L59	Bilinear maps
66- L60	Bilinear maps
67-IT-III	**Internal Test-III**
68- L61	fixed points
69- L62	Applications

70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test12-04-2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**Cos** of the course “<Complex Analysis>”
CO1	Enable the students to understand the functions of complex variables
CO2	Students will obtain knowledge about elementary transformations, concepts in complex variables.
CO3	Enable the students to understand the singularity concepts and residues.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Number Theory
Course Code	**SMMA62**
Class	III year (2017-2018)
Semester	Even
Staff Name	MrsW. Rajammal Ranjitha Mary
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

The study of number theory inevitably includes knowledge of the problems and techniques of elementary number theory, however the tools which have evolved to address such problems and their generalizations are both analytic and algebraic, and often intertwined in surprising ways. This course covers topics from classical number theory including discussions of mathematical induction, prime numbers, division algorithms, congruences, and quadratic reciprocity

Syllabus

NUMBER THEORY (60 Hours)

Unit I Peano" s Axioms – Mathematical Induction – The Binomial Theorem – Early NumberTheory. **11L**

Unit II Division Algorithm – GCD – Euclidean Algorithm – The Diaphantine Equation ax+by=c. **12L**

Unit III The fundamental Theorem of Arithmetic – The Sieve of Eratosthenes – The Goldbach conjecture. **13L**

Unit IV Basis properties of congruences – Linear congruence and the Chinese Remainder Theorem. **11L**

Unit V Fermat‟ s Theorem – Wilson‟ s Theorem – The Fermat – Kraitchik Factorization Method. **13L**

Text Book:
• David .M. Burton - Elementary Number Theory (Sixth Edition) Tata McGraw Hill Education Pvt. Ltd.

Books for Reference :
• Ivan Niven and H, Zuckerman - An Introduction to Theory of Numbers.

• Kumaravelu .S, and Susheela Kumaravelu - Elements Theory - Nagercoil, 2002.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Peano‟s Axioms
3- L3	Peano‟s Axioms
4-L4	Mathematical Induction
5-L5	Mathematical Induction
6-L6	The Binomial Theorem
7-L7	The Binomial Theorem
8- P1	**Inauguration of Mathematics Association**
9- L8	Early Number Theory
10- L9	Early Number Theory
11-L10	Early Number Theory
12-L11	Unit-II Introduction
13-L12	Division Algorithm
14-L13	Division Algorithm
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	GCD
17-IT-1	**Internal Test-I**
18-L16	GCD
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Euclidean Algorithm
21- L19	Euclidean Algorithm
22- P2	**College level meeting/Cell function**
23-L20	The Diaphantine Equation ax+by=c.
24-L21	The Diaphantine Equation ax+by=c.
25-L22	The Diaphantine Equation ax+by=c.

26-L23	Unit-III Introduction
27-L24	The fundamental Theorem of Arithmetic
28-L25	The fundamental Theorem of Arithmetic
29-L26	The Sieve of Eratosthenes
30-L27	The Goldbach conjecture.
31-L28	The Goldbach conjecture.
32-L29	Unit-IV Introduction
33-L30	Basic properties of congruences
34- P3	**Department Seminar**
35-L31	Basic properties of congruences
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	Linear congruence
38- IT-II	**Internal Test-II**
39-L34	Linear congruence
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Chinese Remainder Theorem.
42- L37	Unit-V Introduction
43- L38	Fermat’s Theorem
44- P4	**College level meeting/ function**
45-L39	Fermat’s Theorem
46-L40	Wilson’s Theorem
47-L41	Wilson’as Theorem
48-L42	The Fermat – Kraitchik Factorization Method
49-L43	The Fermat – Kraitchik Factorization Method
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	The Fermat – Kraitchik Factorization Method
52- L46	The Fermat – Kraitchik Factorization Method
53-IT-III	**Internal Test-III**
54-L47	The Fermat – Kraitchik Factorization Method
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	COs of the course “<Number Theory>”
CO1	Enable the students to highlight the beauties in the world of numbers.
CO2	Students get prepared for coding through congruence.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Graph Theory
Course Code	**SMMA63**
Class	III year (2017-2018)
Semester	Even
Staff Name	1)Dr. G. S. Grace Prema
	2)Dr. S. Shyamala Malini
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Graph Theory is an integral part of Discrete Mathematics and has applications indiversified areas such as Electrical Engineering, Computer science, Linguistics
- Study the basic concepts of Graph theory such as Trees, connectivity, tour, trail, cycles, etc.
- To understand the ideas of matchings and colourings in graphs and some of its applications
- Illustration on ramsey number of a graph and Ramsey's graph with recursion formula to calculate ramsey number
- To explain the concepts of independent number and cliques of a graph and its results

Syllabus

GRAPH THEORY (75 Hours)

Unit I: Definition and examples of graphs – degrees – subgraphs – isomorphism – independent sets and coverings – matrices – operation on graphs. **18L**
Unit II: Degree sequences – graphic sequences – walks – trails and paths – connectedness and components – connectivity. **18L**

Unit III: Eulerian graphs – Hamiltonian graphs – characterisation of trees – centre of a tree**. 13L**

Unit IV: Definition and properties of planar graphs – chromatic number and chromatic index **13L.**

Unit V: Chromatic polynomials – definition and basic properties of digraphs – paths and connectedness in digraphs**. 13L**

Text book: Arumugam,S and S. Ramachandran – Invitation to graph Theory, Scitech publications, Chennai.

Books for reference:
• Kumaravelu. S and SusheelaKumaravelu – Graph theory.

• Narasingh Deo – Graph theory with application to engineering and computer science, Prentice – Hall of indiapvt. Ltd., New Delhi.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Definition and examples of graphs
3- L3	Definition and examples of graphs
4-L4	degrees
5-L5	degrees
6-L6	subgraphs
7-L7	subgraphs
8- P1	**Inauguration of Mathematics Association**
9- L8	isomorphism
10- L9	isomorphism
11-L10	independent sets
12-L11	coverings
13-L12	coverings
14-L13	matrices
15-L14	operation on graphs.
16-L15	Unit-II Introduction
17- L16	Degree sequences
18- L17	Degree sequences
19- L18	graphic sequences

20- L19	graphic sequences
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
22- L21	walks – trails and paths
23- IT-1	**Internal Test-I**
24- L22	connectedness and components
25- L23	connectedness and components
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	connectivity
28- L26	Unit-III Introduction
29- L27	Eulerian graphs
30- P2	**College level meeting/Cell function**
31-L28	Eulerian graphs
32-L29	Hamiltonian graphs
33-L30	Hamiltonian graphs
34- L31	characterisation of trees
35- L32	characterisation of trees
36- L33	centre of a tree
37- L34	centre of a tree
38-L35	centre of a tree
39- L36	Unit-IV Introduction
40- L37	Definition and properties of planar graphs
41- L38	Definition and properties of planar graphs
42-P3	**Department Seminar**
43- L39	chromatic number
44- L40	chromatic number
45- L41	chromatic number
46- L42	chromatic index
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
48- L44	chromatic index
49-IT-II	**Internal Test-II**
50-L45	chromatic index
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Unit-V Introduction
53- L48	Chromatic polynomials
54- L49	Chromatic polynomials
55- L50	Chromatic polynomials
56- L51	definition and basic properties of digraphs
57- L52	definition and basic properties of digraphs
58- L53	definition and basic properties of digraphs
59-P4	**College level meeting/ function**
60- L54	paths and connectedness in digraph
61- L55	paths and connectedness in digraph
62- L56	paths and connectedness in digraph
63- L57	paths and connectedness in digraph

64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
65- L59	Exercise problem
66- L60	Exercise problem
67-IT-III	**Internal Test-III**
68- L61	Exercise problem
69- L62	Exercise problem
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test12-04-2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**Cos** of the course “<Graph Theory>”
CO1	Learners will know about the notion of graph theory and its applications.
CO2	Acquisition of knowledge on the techniques of combinatorics in graph theory

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Dynamics
Course Code	**SMMA64**
Class	III year (2017-2018)
Semester	Even
Staff Name	Dr. S. Shyamala Malini
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To provide a basic knowledge of the behaviour of objects in motion
- To develop a working knowledge to handle practical problems

Syllabus

DYNAMICS (60 Hours)

Unit I : Projectiles- Equation of path – range – maximum height- time of flight- range on an inclined plane-problems. **14L**

Unit II : Collision of elastic bodies- Laws of impact- direct and oblique impact-Problems. **11L**

Unit III : Simple Harmonic Motion (SHM) in a straighrt line- Geometrical representation – composition of SHM"s of the same period in the same line and along two perpendicular directions – problems**. 13L**

Unit IV : Motion under the action of central forces – velocity and acceleration in polar co-ordinates – problems. **10L**

Unit V : DifferentialEquation of central orbit - pedal equation of central orbit – problems to find the law of force towards the pole when the orbit is given. **12L**

Text Book: Venkatraman, M.K. - A Text Book on Dynamics, Agasthiar Publication, Trichy.

Books for Reference:

1. Narayanan, S- Dynamics, S.Chand & company, 16th Edition,1986, New Delhi.

2. Duraipandiyan, P, Laxmi Duraipandian and Muthamiz Jayaprgasam- Mechanics 2003, S.Chand & Company.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Projectiles
3- L3	Equation of path
4-L4	Equation of path
5-L5	range
6-L6	range
7-L7	maximum height
8- P1	**Inauguration of Mathematics Association**
9- L8	time of flight
10- L9	range on an inclined plane
11-L10	Problems
12-L11	Unit-II Introduction
13-L12	Collision of elastic bodies
14-L13	Collision of elastic bodies
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	Laws of impact
17-IT-1	**Internal Test-I**
18-L16	direct and oblique impact
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	direct and oblique impact
21- L19	Problems
22- P2	**College level meeting/Cell function**
23-L20	Unit-III Introduction
24-L21	Simple Harmonic Motion (SHM) in a straight line
25-L22	Simple Harmonic Motion (SHM) in a straight line
26-L23	Geometrical representation
27-L24	Geometrical representation
28-L25	Composition of SHM‟s of the same period in the same line and along two perpendicular directions
29-L26	problems
30-L27	problems
31-L28	Unit-IV Introduction
32-L29	Motion under the action of central forces
33-L30	Motion under the action of central forces
34- P3	**Department Seminar**

35-L31	velocity and acceleration in polar co-ordinates
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	problems
38- IT-II	**Internal Test-II**
39-L34	Unit-V Introduction
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Differential Equation of central orbit
42- L37	Differential Equation of central orbit
43- L38	pedal equation of central orbit
44- P4	**College level meeting/ function**
45-L39	pedal equation of central orbit
46-L40	problems to find the law of force towards the pole when the orbit is given
47-L41	problems to find the law of force towards the pole when the orbit is given
48-L42	problems to find the law of force towards the pole when the orbit is given
49-L43	Problems
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	problems
52- L46	problems
53-IT-III	**Internal Test-III**
54-L47	problems
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Dynamics>”
CO1	Acquire basic knowledge on the behaviour of objects in motion.
CO2	Enable the students to develop a working knowledge to handle practical problems.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Trigonometry, Laplace Transforms & Fourier series
Course Code	**SSMA4A**
Class	II year (2017-2018)
Semester	Even
Staff Name	1)Dr. G. Jeya Kumar
	2)Dr. A. Alwyn Asir
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives:

- To understand the concept of Trigonometry
- To know the concept of Laplace transform
- To study the concept of Fourier series

Syllabus

TRIGONOMETRY, LAPLACE TRANSFORMS AND FOURIER SERIES

(60 Hours)

Unit I Trigonometry : Expansions of sin nx, cos nx, tan nx and expansions of sinnx&cosnx**. 10L**

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. **13L**

Unit III Laplace Transforms – Inverse Laplace Transforms**. 13L**

Unit IV Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms. **12L**

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. **12L**

Text Books: Arumugam .S and TangapandiIssac .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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Expansions of sin nx, cos nx, tan nx
3- L3	Expansions of sin nx, cos nx, tan nx
4-L4	Expansions of sin nx, cos nx, tan nx
5-L5	Expansions of sin nx, cos nx, tan nx
6-L6	expansions of $\sin^n x$&$\cos^n x$
7-L7	expansions of $\sin^n x$&$\cos^n x$
8- P1	**Inauguration of Mathematics Association**
9- L8	expansions of $\sin^n x$&$\cos^n x$
10- L9	Unit-II Introduction
11-L10	Hyperbolic functions
12-L11	Hyperbolic functions
13-L12	Relations between hyperbolic functions and circular functions
14-L13	Relations between hyperbolic functions and circular functions
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	Inverse hyperbolic functions
17-IT-1	**Internal Test-I**
18-L16	Inverse hyperbolic functions
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Logarithm of complex numbers
21- L19	Logarithm of complex numbers

22- P2	**College level meeting/Cell function**
23-L20	Summation of series by C + iS method
24-L21	Summation of series by C + iS method
25-L22	Unit-III Introduction
26-L23	Laplace Transforms
27-L24	Laplace Transforms
28-L25	Laplace Transforms
29-L26	Inverse Laplace Transforms
30-L27	Inverse Laplace Transforms
31-L28	Inverse Laplace Transforms
32-L29	Unit-IV Introduction
33-L30	Solving linear differential equations with constant coefficients
34- P3	**Department Seminar**
35-L31	Solving linear differential equations with constant coefficients
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	Solving linear differential equations with constant coefficients
38- IT-II	**Internal Test-II**
39-L34	Solvingsimultaneous equations using Laplace Transforms
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Solvingsimultaneous equations using Laplace Transforms
42- L37	Solvingsimultaneous equations using Laplace Transforms
43- L38	Solvingsimultaneous equations using Laplace Transforms
44- P4	**College level meeting/ function**
45-L39	Unit-V Introduction
46-L40	Fourier Series – Definition
47-L41	Fourier Series – Definition
48-L42	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
49-L43	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	Odd and even functions
52- L46	Odd and even functions
53-IT-III	**Internal Test-III**
54-L47	Half range series
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Trigonometry, Laplace Transforms & Fourier series>”
CO1	Enable the students to understand the concept of Trigonometry
CO2	Gaining knowledge on the concept of Laplace transform
CO3	Learners will know about the concept of Fourier series

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Abstract Algebra-I
Course Code	**SSMA41**
Class	II year (2017-2018)
Semester	Even
Staff Name	Mrs. S. Vijila Velvet Daisy
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the concept of Groups ,Ring and Field.
- To study the concept of homomorphism

Syllabus

ABSTRACT ALGEBRA-I (90 Hours)

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. **18L**

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 **16L**

Unit III Normal subgroups : Quotient groups – Group Homomorphis – Canonical homomorphism – kernel of a homomorphism – Isomorphism –

Automorphism – Inner automorphism – Permutation groups – Cayley" s theorem**. 20L**

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**. 18L**

Unit V Homomorphism of rings – Isomorphism – kernel of a homomorphism – Fundamental theorem – Field of quotients of an integral domain – polynomial rings – Division algorithm **18L**

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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Groups – definition and Examples
3- L3	Groups – definition and Examples
4-L4	Groups – definition and Examples
5-L5	Subgroup – order of an element
6-L6	Subgroup – order of an element
7-L7	Subgroup – order of an element
8-L8	Subgroup – order of an element
9-L9	centre of a group – Normalizer and centralizer
10-P1	**Inauguration of Mathematics Association**
11-L10	centre of a group – Normalizer and centralizer
12-L11	centre of a group – Normalizer and centralizer
13-L12	Product of two subgroups and order of HK
14-L13	Product of two subgroups and order of HK
15-L14	Product of two subgroups and order of HK
16-L15	Intersection and union of subgroups
17-L16	Intersection and union of subgroups
18-L17	Intersection and union of subgroups

19-L18	Unit-II Introduction
20-L19	Cyclic groups
21-L20	Cyclic groups
22-L21	Generators of a cyclic group
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
24-L23	Number of generators of a cyclic groups
25-L24	Number of generators of a cyclic groups
26-IT-1	**Internal Test-I**
27-L25	Cosets – Partitioning of a group by Cosets
28-L26	Cosets – Partitioning of a group by Cosets
29-L27	Cosets – Partitioning of a group by Cosets
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Lagrange‟s theorem – Euler‟s theorem
32- L30	Lagrange‟s theorem – Euler‟s theorem
33- L31	Fermat‟s theorem
34-P2	**College level meeting/Cell function**
35- L32	Unit-III Introduction
36- L33	Quotient groups
37- L34	Quotient groups
38- L35	Group Homomorphis
39- L36	Group Homomorphis
40- L37	Canonical homomorphism
41- L38	Canonical homomorphism
42- L39	Kernel of a homomorphism
43- L40	Kernel of a homomorphism
44- L41	Isomorphism – Automorphism
45- L42	Kernel of a homomorphism
46- L43	Isomorphism – Automorphism
47- L44	Inner automorphism
48- L45	Inner automorphism
49- L46	Permutation groups
50- L47	Permutation groups
51- P3	**Department Seminar**
52- L48	Cayley's theorem
53- L49	Unit-IV Introduction
54- L50	Definition and examples
55- L51	Definition and examples
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
57-L53	Types of rings and Elementary properties of a ring
58-L54	Types of rings and Elementary properties of a ring
59-IT-II	**Internal Test-II**
60- L55	Integral domain – Field – Sub rings
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Integral domain – Field – Sub rings

63- L58	Subfields – Ideals – Principal ideal
64- L59	Integral domain – Field – Sub rings
65- L60	Subfields – Ideals – Principal ideal
66- L61	Quotient ring – Maximal and prime ideals
67- L62	Quotient ring – Maximal and prime ideals
68- L63	Quotient ring – Maximal and prime ideals
69- L64	Characteristic of a ring – PID – UFD
70- L65	Characteristic of a ring – PID – UFD
71- L66	Characteristic of a ring – PID – UFD
72- L67	Unit-V Introduction
73- L68	Homomorphism of rings – Isomorphism
74-P4	**College level meeting/ function**
75- L69	Homomorphism of rings – Isomorphism
76- L70	kernel of a homomorphism
77- L71	Fundamental theorem – Field of quotients of an integral domain
78- L72	Fundamental theorem – Field of quotients of an integral domain
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
80- L74	Fundamental theorem – Field of quotients of an integral domain
81- L75	Polynomial rings
82-IT-III	**Internal Test-III**
83- L76	Division algorithm
84- L77	**Test Paper distribution and result analysis**
85- L78	Division algorithm
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test12-04-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Abstract Algebra-I>”
CO1	Acquire knowledge on the concept of Groups, Ring and Field.
CO2	Gaining knowledge on the concept of homomorphism

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Combinatorial Mathematics
Course Code	**JMMA5D**
Class	III year (2016-2017)
Semester	Odd
Staff Name	Dr. Mrs. G.S. Grace Prema
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To know the basic concepts of Pairings
- To understand relations
- To study the concepts of designs

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-V/ Major Elective – II (A)

Combinatorial Mathematics

Unit I Selections and Binomial coefficients – Permutations – Ordered Selections – Unordered Selections – Miscellaneous Problems.

Unit II Pairings Problems - Pairings within a set – Pairings between sets – An optional assignment problem.

Unit III Recurrence – Fibonacci – type relations. Using generating functions – Miscellaneous methods.

Unit IV The inclusion – Exclusion Principles – The Principle – Rook Polynomials

Unit V Block designs – Square Block designs

Text Books :

1. Ian Andersen – A first course in combinatorial Mathematics – Clarendon Press, Oxford.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-06-2018
1-L1	Introduction
2-L2	Selections and Binomial coefficients
3- L3	Selections and Binomial coefficients
4-L4	Selections and Binomial coefficients
5-L5	Permutations
6-L6	Permutations
7-L7	Permutations
8-L8	Ordered Selections
9-L9	Ordered Selections
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Ordered Selections
12-L11	Unordered Selections
13-L12	Unordered Selections
14-L13	Unordered Selections
15-L14	Miscellaneous Problems
16-L15	Miscellaneous Problems
17-L16	Miscellaneous Problems
18-L17	Pairings Problems
19-L18	Pairings Problems
20-L19	Pairings Problems
21-L20	Pairings Problems
22-L21	Pairings within a set
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins (30-07-2018)
24-L23	Pairings within a set
25-L24	Pairings within a set
26-IT-1	**Internal Test-I**
27-L25	Pairings within a set
28-L26	Pairings between sets
29-L27	Pairings between sets
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Pairings between sets
32- L30	Pairings between sets
33- L31	An optional assignment problem.
34-P2	**College level meeting/Cell function**
35- L32	An optional assignment problem
36- L33	An optional assignment problem
37- L34	An optional assignment problem
38- L35	Recurrence
39- L36	Recurrence

40- L37	Recurrence
41- L38	Recurrence
42- L39	Fibonacci
43- L40	Fibonacci
44- L41	Fibonacci
45- L42	type relations
46- L43	type relations
47- L44	type relations
48- L45	Using generating functions
49- L46	Using generating functions
50- L47	Using generating functions
51- P3	**Department Seminar**
52- L48	Miscellaneous methods
53- L49	Miscellaneous methods
54- L50	Miscellaneous methods
55- L51	Miscellaneous methods
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(03-09-2018)
57-L53	The inclusion
58-L54	The inclusion
59-IT-II	**Internal Test-II**
60- L55	The inclusion
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	The inclusion
63- L58	Exclusion Principles
64- L59	Exclusion Principles
65- L60	Exclusion Principles
66- L61	Exclusion Principles
67- L62	The Principle
68- L63	The Principle
69- L64	The Principle
70- L65	The Principle
71- L66	Rook Polynomials
72- L67	Rook Polynomials
73- L68	Rook Polynomials
74-P4	**College level meeting/ function**
75- L69	Block designs
76- L70	Block designs
77- L71	Block designs
78- L72	Block designs
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(08-10-2018)
80- L74	Square Block designs
81- L75	Square Block designs
82-IT-III	**Internal Test-III**
83- L76	Square Block designs
84- L77	**Test Paper distribution and result analysis**

85- L78	Square Block designs
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-10-2018

Course Outcomes

Learning Outcomes	**COs** of the course "Combinatorial Mathematics"
CO1	Acquisition of knowledge on the basic concepts of Pairings and arrangements etc.
CO2	Enable the students to understand aspects of assignment problems.
CO3	Students will be able to understand the concepts of block designs.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc. Mathematics
Course Name	Calculus
Course Code	**JMMA11**
Class	I year (2016-2017)
Semester	Odd
Staff Name	Dr(Mrs) J.SureshSuseela, Mrs. T.Santhakumari
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To define the curvature and its radius and discuss its properties in both cartesian and polar coordinate systems
- Define curve, graph, involute and evolute and solve related problems
- Study the curve tracing techniques on graphs and discuss some properties graphically
- Discuss the concepts of asymptotes, especially the asymptotes parallel to axes and inclined lines
- To examine various techniques of integration and apply them to definite and improper integrals
- To study about special integral functions, called beta and gamma functions

Syllabus

CALCULUS

Unit I Radius of Curvature in Cartesian and polar Co-ordinates, Pedal Equation - Involute and evolute - chord of curvature

Unit II Asymptotes - singular points (Node, cusp, Conjugate Points)

Unit III Tracing of curves - Folium of Descarte’s - Cycloid, Cardioid and Lemniscate of Bernoulli

Unit IV Properties of Definite Integral - Bernoulli's formula and Reduction Formulae -

Double and Triple Integrals - Changing the order of integration - Jacobians and change of variables

Unit V Beta and Gamma functions - Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals, Improper Integrals.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2016
1-L1	Introduction
2-L2	Introduction
3- L3	Radius of Curvature in Cartesian and polar Co-ordinates
4-L4	Radius of Curvature in Cartesian and polar Co-ordinates
5-L5	Radius of Curvature in Cartesian and polar Co-ordinates
6-L6	Pedal Equation
7-L7	Pedal Equation
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Pedal Equation
10- L9	Involute and evolute
11-L10	Involute and evolute
12-L11	Involute and evolute
13-L12	chord of curvature
14-L13	chord of curvature
15-L14	chord of curvature
16-L15	chord of curvature
17- L16	Asymptotes
18- L17	Asymptotes
19- L18	Asymptotes
20- L19	singular points (Node, cusp, Conjugate Points)
21- L20	Problem Discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins(25.07.2016)
22- L21	singular points (Node, cusp, Conjugate Points)
23- IT-1	**Internal Test-I**
24- L22	singular points (Node, cusp, Conjugate Points)
25- L23	singular points (Node, cusp, Conjugate Points)
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Tracing of curves
28- L26	Tracing of curves
29- L27	Tracing of curves
30- P2	**College level meeting/Cell function**
31-L28	Folium of Descarte's
32-L29	Folium of Descarte's
33-L30	Folium of Descarte's
34- L31	Cycloid, Cardioid and LemniscateofBernoulli
35- L32	Cycloid, Cardioid and LemniscateofBernoulli
36- L33	Cycloid, Cardioid and LemniscateofBernoulli

37- L34	Cycloid, Cardioid and LemniscateofBernoulli
38- L35	Properties of Definite Integral
39- L36	Properties of Definite Integral
40- L37	Properties of Definite Integral
41- L38	Properties of Definite Integral
42-P3	**Department Seminar**
43- L39	Bernoulli's formula and Reduction Formulae
44- L40	Bernoulli's formula and Reduction Formulae
45- L41	Bernoulli's formula and Reduction Formulae
46- L42	Double and Triple Integrals
47- L43	Problem Discussion - **Allotting portion for Internal Test-II**
	Internal Test II begins(22.08.2016)
48- L44	Double and Triple Integrals
49-IT-II	**Internal Test-II**
50-L45	Double and Triple Integrals
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Changing the order of integration
53- L48	Changing the order of integration
54- L49	Changing the order of integration
55- L50	Jacobians and change of variables
56- L51	Jacobians and change of variables
57- L52	Jacobians and change of variables
58- L53	Beta and Gamma functions
59-P4	**College level meeting/ function**
60- L54	Beta and Gamma functions
61- L55	Beta and Gamma functions
62- L56	Application of Beta and Gamma Functions inevaluation of Double and Triple Integrals
63- L57	Application of Beta and Gamma Functions inevaluation of Double and Triple Integrals
64- L58	Problem Discussion - **Allotting portion for Internal Test-III**
	Internal Test III begins(03.10.2016)
65- L59	Application of Beta and Gamma Functions inevaluation of Double and Triple Integrals
66- L60	Improper Integrals
67-IT-III	**Internal Test-III**
68- L61	Application of Beta and Gamma Functions inevaluation of Double and Triple Integrals
69- L62	Application of Beta and Gamma Functions inevaluation of Double and Triple Integrals
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (17.10.2016)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**

75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30.11.2016

Course Outcomes

Learning Outcomes	**COs** of the course "Calculus"
CO1	Enable the students to learn and gain knowledge about curvatures, integrations and its geometrical applications.
CO2	On successful completion of course the students should have gained about the evolutes and envelopes, different types of integrations, its geometrical application, single and multiple integration

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Real Analysis I
Course Code	**JMMA31**
Class	II year (2016-2017)
Semester	Odd
Staff Name	Mrs.S.Vijila Velvet Daisy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Learn to work with logarithmic, exponential, and inverse trigonometric functions.
- Learn to work with infinite sequences and series.
- Learn to work with infinite sequence is bounded.
- Learn to work with an infinite sequence is monotonic.
- Learn to work with an infinite sequence is convergent or divergent.
- Find the sequence of partial sums of an infinite series.

Syllabus

MSU/2016-17/UG-Colleges /Part-III (B.Sc. Mathematics)/ Semester-III/ Ppr.no.15/ Core-5

REAL ANALYSIS - I

Unit I 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 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 Infinite series – nth term test – Comparison test – Kummer‟s test – D‟Alemberls ratio test – Raabe‟s test - Gauss test – Root test – Canchy‟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 – Maclaurins series.

Text Books:
1) Arumugam .S and ThengapandiIssac – “sequences and series”, New Gamma publishing House, Palayamkottai – 627 002.
2) 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

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2017
1-L1	Introduction
2-L2	The field of axioms, the order axioms, the rational numbers.
3- L3	The field of axioms, the order axioms, the rational numbers.
4-L4	the irrational numbers, upper bounds, maximum element, least upper bound (supremum)
5-L5	the irrational numbers, upper bounds, maximum element, least upper bound (supremum)
6-L6	The completeness axiom, absolute values, the triangle inequality.
7-L7	The completeness axiom, absolute values, the triangle inequality.
8-L8	Cauchy – schwartz‟s inequality.
9-L9	Cauchy – schwartz‟s inequality.
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Bounded sequences
12-L11	Bounded sequences
13-L12	monotonic sequences
14-L13	monotonic sequences
15-L14	convergent sequences
16-L15	convergent sequences
17-L16	convergent sequences
18-L17	divergent and oscillating sequences
19-L18	divergent and oscillating sequences
20-L19	divergent and oscillating sequences
21-L20	The algebra of limits.
22-L21	The algebra of limits.
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(31.07.2017)
24-L23	Behaviour of monotonic sequences
25-L24	Behaviour of monotonic sequences
26-IT-1	**Internal Test-I**
27-L25	Cauchy‟s first limit theorem
28-L26	Cauchy‟s first limit theorem
29-L27	Cauchy‟s first limit theorem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Cauchy‟s second limit theorem

32- L30	Cauchy"s second limit theorem
33- L31	Cesaro"s theorem
34-P2	**College level meeting/Cell function**
35- L32	Cesaro"s theorem
36- L33	subsequences
37- L34	subsequences
38- L35	Cauchy sequence
39- L36	Cauchy sequence
40- L37	Cauchy"s general principle of convergence.
41- L38	Cauchy"s general principle of convergence.
42- L39	Cauchy"s general principle of convergence.
43- L40	Infinite series
44- L41	Infinite series
45- L42	nth term test
46- L43	Comparison test
47- L44	Comparison test
48- L45	Kummer"s test
49- L46	Kummer"s test
50- L47	Kummer"s test
51- P3	**Department Seminar**
52- L48	D"Alemberls ratio test
53- L49	D"Alemberls ratio test
54- L50	Raabe"s test
55- L51	Raabe"s test
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(30.08.2017)
57-L53	Gauss test
58-L54	Root test
59-IT-II	**Internal Test-II**
60- L55	Canchy"s condensation test (without proof)
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Alternating series
63- L58	Alternating series
64- L59	Leibnitz"s test
65- L60	Leibnitz"s test
66- L61	Leibnitz"s test
67- L62	Tests for convergence of series of arbitrary terms
68- L63	Tests for convergence of series of arbitrary terms
69- L64	Tests for convergence of series of arbitrary terms
70- L65	Power series
71- L66	Power series
72- L67	Taylor"s series
73- L68	Taylor"s series
74-P4	**College level meeting/ function**
75- L69	Maclaurins series.
76- L70	Maclaurins series.
77- L71	Maclaurins series.

78- L72	Class Test
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(03.10.2017)
80- L74	Revision
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (19.10.2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Real Analysis I"
CO1	Enable the students with a good foundation of classical analysis.
CO2	Learners will obtain the knowledge on behaviour of sequences and series.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Real Analysis II
Course Code	**JMMA51**
Class	III year (2016-2017)
Semester	Odd
Staff Name	Mrs.W.Ranjitha Mary
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To understand the real number of system and metric spaces.
- To know the concepts of continuity and Riemann integrals
- To study the concept of connectedness and compactness

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-V/ Core - 7

REAL ANALYSIS – II

Unit I Metric spaces – Examples – bounded sets – open ball – open sets – subspaces – Interior of a set.

Unit II Closed sets – closure – Limit points – Dense sets – complete metric space – Cantor's intersection theorem – Baire's Category Theorem.

Unit III Continuous functions on metric spaces : Functions - continuous at a point on the real line – Functions - Continuous – uniform continuous in a metric space – Discontinuous function or R1.

Unit IV Connectedness and compactness : Connectedness – connected subset of R – connectedness and continuity – compact metric spaces – compact subset of R^1 – Heine Borel theorem.

Unit V Riemann Integral : Sets of measure zero – Existence of the Riemann integral – Derivatives – Rolle's theorem – Fundamental theorem of Calculus – Mean value theorem – Cauchy's mean value theorem – Taylor's theorem.

Text Books:

1)Arumugam & Others – Modern Analysis

2) Malic .S.C – Mathematical Analysis, Wiley Eastern Limited, New Delhi.

Books for Reference :

1. Tom .M. Apostal – Mathematical Analysis, II Edition, Narosa Publishing House, New Delhi (Unit I) (1997)
2. Goldberg .R – Methods of Real Analysis Oxford and IBH Publishing Co. New Delhi (200)
3. Viswanath Naik .K – Real Analysis, Emerald Publishers, Chennai.
4. Malic .S.C and Savitha Arora (1991) - Mathematical Analysis, Wiley Eastern Limited, New Delhi.
5. Berberian .S.K – First course in Real Analysis, Springer Verlag, New York.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-06-2018
1-L1	Introduction
2-L2	Metric spaces
3- L3	Metric spaces
4-L4	Metric spaces
5-L5	Examples
6-L6	Examples
7-L7	bounded sets
8-L8	bounded sets
9-L9	open ball
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	open sets
12-L11	open sets
13-L12	subspaces
14-L13	subspaces
15-L14	Interior of a set
16-L15	Interior of a set
17-L16	Closed sets
18-L17	Closed sets
19-L18	closure
20-L19	closure
21-L20	Limit points
22-L21	Limit points
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**

	Internal Test I begins(30-07-2018)
24-L23	Dense sets
25-L24	Dense sets
26-IT-1	**Internal Test-I**
27-L25	complete metric space
28-L26	complete metric space
29-L27	Cantor's intersection theorem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Baire's Category Theorem
32- L30	Continuous functions on metric spaces
33- L31	Continuous functions on metric spaces
34-P2	**College level meeting/Cell function**
35- L32	continuous at a point on the real line
36- L33	continuous at a point on the real line
37- L34	Functions
38- L35	Continuous
39- L36	uniform continuous in a metric space
40- L37	uniform continuous in a metric space
41- L38	connected subset of R
42- L39	connected subset of R
43- L40	connectedness and continuity
44- L41	connectedness and continuity
45- L42	Discontinuous function or R^1
46- L43	Discontinuous function or R^1
47- L44	Connectedness and compactness
48- L45	Connectedness and compactness
49- L46	connected subset of R
50- L47	connected subset of R
51- P3	**Department Seminar**
52- L48	connectedness and continuity
53- L49	connectedness and continuity
54- L50	connectedness and continuity
55- L51	compact metric spaces
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(03-09-2018)
57-L53	compact metric spaces
58-L54	compact metric spaces
59-IT-II	**Internal Test-II**
60- L55	compact subset of R1
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	compact subset of R1
63- L58	Heine Borel theorem
64- L59	Sets of measure zero
65- L60	Sets of measure zero
66- L61	Existence of the Riemann integral
67- L62	Existence of the Riemann integral

68- L63	Derivatives
69- L64	Derivatives
70- L65	Rolle’s theorem
71- L66	Rolle’s theorem
72- L67	Fundamental theorem of Calculus
73- L68	Fundamental theorem of Calculus
74-P4	**College level meeting/ function**
75- L69	Mean value theorem
76- L70	Mean value theorem
77- L71	Cauchy’s mean value theorem
78- L72	Cauchy’s mean value theorem
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(08-10-2018)
80- L74	Taylor’s theorem
81- L75	Taylor’s theorem
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-10-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Real Analysis II”
CO1	Students can understand the real number of system and metric spaces.
CO2	Students will know the concepts of continuity and Riemann integrals.
CO3	Enable the students to understand the concept of connectedness and compactness.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Combinatorial Mathematics
Course Code	**GMMA5B**
Class	III year(2016 – 2017)
Semester	Odd
Staff Name	G.S.GRACE PREMA
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives .

- Combinatorics is a branch of mathematics concerning the study of finite or countable discrete structures.
- Aspects of combinatorics include counting the structures of a given kind and size (enumerative combinatorics), deciding when certain criteria can be met, and constructing and analyzing objects meeting the criteria.
- Many combinatorial questions have historically been considered in isolation, giving an adhoc solution to a problem arising in some mathematical context. In the later twentieth century, however, powerful and general theoretical methods were developed, making combinatorics into an independent branch of mathematics in its own right.
- Combinatorics is used frequently in computer science to obtain formulas and estimates in the analysis of algorithms

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2016
1-L1	Unit-1 Introduction
2-L2	Definition for colourings and examples
3- L3	Theorem for colouring
4-L4	Recurrence relation- definitions, examples and problems
5-L5	Permutation-Definition, Theorems
6-L6	Permutation related problems
7-L7	Definition for p(n,r) and problems
8-L8	Combination definition
9-L9	Combination related theorems and problems
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Pascal’s identity theorem
12-L11	Problems for Binomial theorem
13-L12	Exponential-Definition and theorem
14-L13	Problems on permutation
15-L14	Exercise problems of permutation
16-L15	Unit-2 Pairings definitions and examples
17-L16	Definition- vertices, edges, graph and example
18-L17	Perfect matching definitions
19-L18	Perfect matching examples
20-L19	Perfect matching Theorem
21-L20	Pairing between sets
22-L21	Hall’s theorem on distinct representation or Assignment of Marriage theorem
23-L22	Latin square-Definitions and examples- **Allotting portion for Internal Test-I**
	Internal Test I begins (25-07-2016)
24-L23	Problems on Latin squares
25-L24	Latin rectangle-Definitions and examples
26-IT-1	**Internal Test-I**
27-L25	Hungarian Algorithm for solving assignment

28-L26	Assignment problems
29-L27	Balanced Assignment problems
30-L28	Unbalanced Assignment problems **-Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Unbalanced Assignment problems
32- L30	Travelling salesman problem
33- L31	Travelling salesman problems
34-P2	**College level meeting/Cell function**
35- L32	Unit-3 Recurrence relation- Definition and examples
36- L33	Solving the recurrence relation
37- L34	Problems on recurrence relation
38- L35	Problems on recurrence relation
39- L36	Problems on recurrence relation
40- L37	Derivation of Fibonacci relation
41- L38	The problems of derangements-Definitions and problems
42- L39	Another formulation for derangement
43- L40	Partition of an integer, tree-Definitions and examples
44- L41	Degree of vertex, simple tree, rooted simple tree-definitions and examples
45- L42	Rooted simple tree's problems
46- L43	The generating function for rooted simple tree
47- L44	Problems on generating function for rooted simple tree
48- L45	Possible number of colouring problems
49- L46	Unit-4 The inclusion- exclusion principle
50- L47	Theorem for $\vert A\cup B \cup c\vert\ and \vert A \cup B \cup C \cup D\vert$
51- P3	**Department Seminar**
52- L48	Problems on inclusion –exclusion principle
53- L49	Problems on inclusion-exclusion principle
54- L50	Rook Polynomial-definition
55- L51	Rook polynomial problems
56-L52	Rook polynomial problems- **Allotting portion for Internal Test-II**
	Internal Test II begins(22-08-2016)
57-L53	Rook polynomial for 4x4 board and 8x8 board
58-L54	Non-interfering definitions and theorem
59-IT-II	**Internal Test-II**
60- L55	Another theorem of non-interfering
61- L56	Rook polynomial problems- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems on Rook polynomial
63- L58	Rook polynomial for 6x6 Latin square
64- L59	Rook polynomial for5x5 Latin square
65- L60	Problems on Rook polynomial
66- L61	Problems on Rook polynomial
67- L62	problems on Rook polynomial
68- L63	Unit-5 Block designs, Block -definition
69- L64	Matrix representation for Block designs
70- L65	Properties of the incident matrix
71- L66	Incident matrix problem

72- L67	Incident matrix problem
73- L68	Block design related theorem
74-P4	**College level meeting/ function**
75- L69	Properties of 7 point plane
76- L70	Incident matrix problem
77- L71	Fisher's theorem
78- L72	Note for incidence matrix
79- L73	Square Block design –Definition, properties and theorem - **Allotting portion for Internal Test-III**
	Internal Test III begins (03-10-2016)
80- L74	Theorem for square block design
81- L75	Finite projective plane definition and notes
82-IT-III	**Internal Test-III**
83- L76	Properties of finite projective plane
84- L77	Finite projective place related lemmas and theorem - **Test Paper distribution and result analysis**
85- L78	Hadamard matrix- definitions and examples
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (17-10-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course Combinatorial Mathematics
CO1	Demonstrate effectively the addition and multiplication principles and use it for counting.
CO2	Use generating functions and the concept of partition to solve combinatorial problems.
CO3	Model recurrence relations using different techniques for real time counting problems and find solutions.
CO4	Outline special counting numbers such as Fibonacci number, Stirling numbers, catalan number and Menage number.
CO5	Design a new counting principle called inclusion and exclusion principle and use it for counting problems.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	CODING THEORY
Course Code	**GMMA5E**
Class	III year(2016-2017)
Semester	Odd
Staff Name	T Stalin Alexis
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Learners get introduced to coding and decoding concepts.
- Train the students in the field of coding theory.

Syllabus

Text: Coding Theory , the essentials-(marcalDekkar, 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 wordtransmitted.

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-Equvalent 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 extenedGolay code-Golaycode..

Unit 5: Polynomials and Words-Introduction to cyclic codes-Polynomial encoding and decoding-Finding cyclic codes-Dual Cyclic Codes.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2016
1-L1	Unit-1 Coding theory Introduction, word
2-L2	List all the words of lengths and examples
3- L3	Basic assumption about the channel
4-L4	Correcting and deleting error batterns
5-L5	Problem 1,2,3,4,5,6 in correcting and detecting error batterns
6-L6	Information rate
7-L7	Finding the most likely codeword transmitted and problems
8-L8	Theorem
9-L9	Some basic Algebra and examples and problems in basic algebra
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Weight and Distance (Add some distance problems)
12-L11	Maximum likelihood Decoding
13-L12	Reliability of Maximum Likelihood Decoding
14-L13	Error detecting codes
15-L14	Distance of the codes
16-L15	Unit-2 Linear codes
17-L16	Exercise problems in linear codes
18-L17	Two important subspaces- Linear scalar product (or) Dot product
19-L18	Orthogonal vector. Orthogonal to the set
20-L19	Linear Independence, example problems
21-L20	Basic examples and exercise
22-L21	Dimension –examples and exercise
23-L22	Matrices and exercises problems- **Allotting portion for Internal Test-I**
	Internal Test I begins (25-07-2016)
24-L23	Elementary Row operation Leading one and leading column
25-L24	Row Echelon form (REF), Reduced Row Echelon form (PREF)
26-IT-1	**Internal Test-I**
27-L25	Bases for c= $< s >$ and c⊥ $examplesandexercise$
28-L26	Algorithm and examples and exercise problems
29-L27	Algorithm for finding the basis
30-L28	Generating Matrices-Example and exercise problems- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Encoding and exercise
32- L30	Unit-3 parity – check Matrices
33- L31	Theorem 2.7.1
34-P2	**College level meeting/Cell function**
35- L32	Theorems on parity
36- L33	Exercise problems in parity check matrices
37- L34	Exercise problems in parity check matrices
38- L35	Equivalent codes
39- L36	Theorem any linear code c is a equivalent to a linear code C having a generator matrix in standard form

40- L37	Examples and exercise problems
41- L38	Exercise problems in equivalent codes
42- L39	Distance of a linear code
43- L40	Examples and exercise problems
44- L41	Examples and exercise problems
45- L42	Distance of a linear code exercise problems
46- L43	Cosets
47- L44	Example and exercise problems
48- L45	Theorem and Exercise problems
49- L46	Exercise problems in cosaets of the linear code
50- L47	Exercise problems in cosets of a linear code
51- P3	**Department Seminar**
52- L48	Exercise problems in cosets of a linear code
53- L49	Minimal likelihood decoding for linear codes
54- L50	Exercise problems in linear codes
55- L51	Reliability of linear codes
56-L52	Syndrome of the word - **Allotting portion for Internal Test-II**
	Internal Test II begins (22-08-2016)
57-L53	Syndrome decoding array and exercise problems
58-L54	Unit-4 Perfect and related codes
59-IT-II	**Internal Test-II**
60- L55	some bounds forcodeas, hamming
61- L56	Maximum distance separable -**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorem on maximum distance separable
63- L58	Theorems on maximum distance separable
64- L59	Corollary and the theorems
65- L60	Exercise problems in maximum distance separable
66- L61	Theorem Gilbert –varshamov bound
67- L62	Corollary of that theorem
68- L63	Exercise problems in maximum distance separable
69- L64	Perfect codes
70- L65	Hamming codes, extended code
71- L66	Parity check matrix for extended code
72- L67	Weight of the word in the extended code
73- L68	Distance of the extended code
74-P4	**College level meeting/ function**
75- L69	The extended Golay code
76- L70	Unit-5 cyclic linear code
77- L71	Algorithm and division algorithm
78- L72	Exercise problems in division algorithm
79- L73	Polynomial encoding and decoding**Allotting portion for Internal Test-III**
	Internal Test III begins (03-10-2016)
80- L74	Algorithm for decoding linear cyclic decoding
81- L75	Finding cyclic codes
82-IT-III	**Internal Test-III**
83- L76	Another method for linear cyclic codes
84- L77	Exercise problems in linear cyclic codes - **Test Paper distribution and**

	result analysis
85- L78	Dual cyclic codes
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (17-10-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course Coding theory
CO1	Acquire basic knowledge of coding.
CO2	Enable the students to understand the functions of linear cyclic codes
CO3	Students get prepared for coding through congruence.
CO4	Acquisition of knowledge on the techniques of division algorithm in coding theory

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Sequences, Series and Trigonometry
Course Code	**GMMA21**
Class	II year (2016-2017)
Semester	Odd
Staff Name	S Vijila Velvet Daisy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Gaining knowledge on series.
- Gaining knowledge on Trignomentry.

Syllabus

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 ofseries-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+ method-Gregory‘s series.
(Text-2 Chapter IV(full), Chapter V-Section 5, Chapter VI-Section 3)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2016
1-L1	UNIT-I Sequences and its examples
2-L2	Bounded Sequences
3- L3	Monotonic Sequences
4-L4	Convergent Sequences and theorem
5-L5	Examples and theorem on convergent Sequences
6-L6	Divergent and oscillating Sequences
7-L7	Theorems and examples on Divergent
8-L8	The algebra of limits
9-L9	Theorem and corollary on Monotonic
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Theorem 15,16,17
12-L11	Theorem 18,19
13-L12	Theorem 20,21
14-L13	Results on Algebra of limits
15-L14	Theorem and example
16-L15	Problems on algebra of limits
17-L16	Problems on algebra of limits
18-L17	UNIT-II Behaviour of Monotonic sequence
19-L18	Problems on Monotonic sequence
20-L19	Problems on Monotonic sequence
21-L20	Cauchy’s 1^{st} limit theorem
22-L21	Cauchy’s theorem
23-L22	Cauchy’s 2^{nd} limit theorem - **Allotting portion for Internal Test-I**
	Internal Test I begins (25.07.2016)
24-L23	Problems on limit theorem
25-L24	Problems on limit theorem
26-IT-1	**Internal Test-I**
27-L25	Subsequence’s
28-L26	Peak point definition and theorem
29-L27	Limit point
30-L28	Cauchy’s Sequences - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Cauchy’s general principle of convergence
32- L30	Examples on limit point
33- L31	Theorem on limit point
34-P2	**College level meeting/Cell function**

35- L32	UNIT-III Series of positive terms definition and theorem
36- L33	Examples and Note on series
37- L34	Cauchy’s general principle of convergence
38- L35	Comparison test
39- L36	Theorem on Comparison test
40- L37	Problems on Comparison test
41- L38	Problems on Comparison test
42- L39	Kummer’s test
43- L40	D’Alembert’s ratio test
44- L41	Raabe’s test
45- L42	Demorgan and Bertand’s test
46- L43	Gauss test
47- L44	Problems on Gauss test
48- L45	Problems on Raabe’s test
49- L46	Cauchy’s root test
50- L47	Cauchy’s condensation test
51- P3	**Department Seminar**
52- L48	UNIT-IV Alternating series
53- L49	Leibnitz test
54- L50	Problems on Leibnitz test
55- L51	Problems on Leibnitz test
56-L52	Absolute convergence - **Allotting portion for Internal Test-II**
	Internal Test II begins (22-08-2016)
57-L53	Conditionally convergence
58-L54	Theorem and Problems on Absolute convergence -
59-IT-II	**Internal Test-II**
60- L55	Problems on conditionally convergence
61- L56	Multiplication of series - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Examples and Note
63- L58	Abel’s Theorem
64- L59	Theorem on Absolute convergence
65- L60	Problems on Absolute convergence
66- L61	Marten’s Theorem
67- L62	Theorems on Absolute convergence
68- L63	Problems on Mertens
69- L64	UNIT-V Hyperbolic function
70- L65	Results on Hyperbolic function
71- L66	Hyperbolic function definition and notes
72- L67	Relation between Hyperbolic function
73- L68	Problems on Hyperbolic function
74-P4	**College level meeting/ function**
75- L69	Hyperbolic function corresponding to relation between circular function
76- L70	Problems on Hyperbolic function
77- L71	Inverse hyperbolic function
78- L72	Problems on Inverse hyperbolic function
79- L73	Problems on Inverse hyperbolic function - **Allotting portion for Internal Test-III**

	Internal Test III begins (03-10-2016)
80- L74	Logarithms and complex quantities
81- L75	General value of logarithm of (x+iy)
82-IT-III	**Internal Test-III**
83- L76	Problems on Logarithms
84- L77	Summation of series - **Test Paper distribution and result analysis**
85- L78	Summation of series
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 17-10-2016**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Sequences, Series and Trigonometry"
CO1	acquire the knowledge of various inequalities and their applications
CO2	have in-depth knowledge of various types of sequences
CO3	learn sub-sequences and also finding the limits of sequences
CO4	deepen the knowledge of infinite series and various tests for finding the behaviour of series
CO5	apply these concepts in other fields of mathematics

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	LINEAR ALGEBRA
Course Code	**GMMA51**
Class	III year (2016-2017)
Semester	Odd
Staff Name	J VIJAYA XAVIER PARITHIPAN
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Linear algebra is a branch of mathematics that studies systems of linear equations and the properties of matrices.
- The concepts of linear algebra are extremely useful in physics, economics and social sciences, natural sciences, and engineering.
- To understand the axiomatic structure of a modern mathematical subject and learn to construct simple proofs.
- To solve problems those apply Linear Algebra to Chemistry, Economics and Engineering.

Syllabus

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))

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2016
1-L1	Unit-I Introduction
2-L2	Definitions and Examples
3- L3	Scalars, vectors, scalars multiple
4-L4	Notes and Remarks
5-L5	Theorems on vectorspace
6-L6	Subspaces
7-L7	Theorems on supspaces
8-L8	Solved problems and examples
9-L9	Theorems using operations
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Linear transformation
12-L11	Definitions about Homomorphism, Epimorphism and Kernel
13-L12	Fundamental theorem of homomorphism
14-L13	Theorems on vector spaces
15-L14	Span of a set
16-L15	Linear combination, linear span
17-L16	Theorems and examples
18-L17	Unit-II Linear independence
19-L18	Finite dimensional
20-L19	Finite dimensional and its theorems
21-L20	Examples on finite dimensional
22-L21	Linearly independence and dependent
23-L22	Exercises problem - **Allotting portion for Internal Test-I**
	Internal Test I begins(25-07-2016)
24-L23	Note and examples
25-L24	Theorems – any subset of a linearly independent set is linearly independent
26-IT-1	**Internal Test-I**
27-L25	Theorems and examples
28-L26	Basis
29-L27	Theorems on basis
30-L28	Exercise problem - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Theorems and examples
32- L30	Any two bases of finite dimensional vector space V have the same numbers of elements
33- L31	Dimensional
34-P2	**College level meeting/Cell function**
35- L32	Maximal linear independent set
36- L33	Unit-III Rank and nullity

37- L34	Theorems and examples
38- L35	Singular and non-singular
39- L36	Exercise problems on rank
40- L37	Some solved problems on
41- L38	Matrix of a linear transformation
42- L39	Note on matrix
43- L40	Solved problems on Rank of matrix
44- L41	Definition and theorems
45- L42	Exercise problems on matrix
46- L43	Rank of matrix
47- L44	Solved problems
48- L45	Characteristic matrix
49- L46	Theorems and examples on Rank of matrix
50- L47	Theorems and corollary on Rank of matrix
51- P3	**Department Seminar**
52- L48	Solved problems on Characteristic matrix
53- L49	Unit-IV Characteristis equation and cayley Hamilton theorem
54- L50	Matrix polynomial
55- L51	Definitions and examples
56-L52	Cayley Hamilton theorem - **Allotting portion for Internal Test-II**
	Internal Test II begins(22-08-2016)
57-L53	Note and solved problems on Cayley Hamilton theorem
58-L54	Problems using Cayley Hamilton theorem
59-IT-II	**Internal Test-II**
60- L55	Exercise problem on Cayley Hamilton theorem
61- L56	Eigenvalues ,Eigen vectors - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Characteristic roots and properties of Eigen values
63- L58	Results on Eigen values
64- L59	Corollary of Eigen values
65- L60	Solved problems on Eigen values
66- L61	Solved problems on Eigen values
67- L62	Problems to find Eigenvalues
68- L63	Problems to find Eigenvalues
69- L64	Solved problems on Eigenvalue
70- L65	Unit-V Inner product spaces
71- L66	Eucildean space
72- L67	Some notes on Eucildean space
73- L68	Theorems and examples on Eucildean space
74-P4	**College level meeting/ function**
75- L69	Norm, unit vector-definition
76- L70	Solved problems on Norm
77- L71	Theorems using norm
78- L72	Orthogonal
79- L73	Some notes and definitions - **Allotting portion for Internal Test-III**
	Internal Test III begins(03-10-2016)
80- L74	Theorems using orthogonal set
81- L75	Gram –Schmidt Orthogonalisation

82-IT-III	**Internal Test-III**
83- L76	Solved problems on orthogonal set
84- L77	Orthogonal complement - **Test Paper distribution and result analysis**
85- L78	Corollary and solved problems on Orthogonal complement
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (17-10-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course linear Algebra
CO1	Enable the students to learn about the convergence and divergence of the series.
CO2	find the roots for the different types of the equations
CO3	On successful completion of this course the students should have gained knowledge about the convergence of series and solving equations.
CO4	know the fundamentals of vector space
CO5	Understand basis and dimension of a vector space.
CO6	Determine Eigen values and Eigen vectors.
CO7	Get interest in pure mathematics.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B Sc Mathematics
Course Name	Real Analysis
Course Code	**GMMA52**
Class	III year(2016-2017)
Semester	Odd
Staff Name	S Vijila Velvet Daisy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The course deals with metric spaces which is a classical extension of the real line and its properties in terms of the distance.
- The course introduces to the students, metric spaces and its properties. The properties like connectedness, completeness and compactness which are inherent in nature in the real line are extended to the metric spaces.
- Also properties like continuity and uniform continuity are exploited.

Syllabus

Major Paper 8: Real Analysis (90 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 **R**.
(Chapter 4(full))

Unit 4: Connectedness-Connected subsets of **R**-Connectedness and Continuity-Contraction Mapping Theorem.
(Chapter 5 (full) and Chapter 8 upto theorem 8.2)

Unit 5: Compactness-Comapct metric spaces-Compact subsets of **R-**Heine Borel Theorem-Equivalent Characterizations for compactness-Compactness and Continuity. (Chapter 6(full))

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2016
1-L1	Unit-I Introduction on Countable sets
2-L2	Theorems and Problems in countable sets
3- L3	Uncountable sets
4-L4	Metric spaces: Definition and examples
5-L5	Examples on a metric spaces
6-L6	Solved problems on a metric spaces
7-L7	Bounded sets in a metric spaces
8-L8	Definition of diameter and its examples
9-L9	Open ball in a metric space
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Examples in open ball
12-L11	Open sets: Definition and examples
13-L12	Theorem on open sets
14-L13	Solved problems on open sets
15-L14	Equivalentmetrices
16-L15	Subspaces: Definition and examples
17-L16	Solved problems on subspaces
18-L17	Unit-II Interior of a set: Definition and examples
19-L18	Interior of a set: Theorems
20-L19	Closed set: Definition and examples
21-L20	Closed ball: Definition, examples and theorem
22-L21	Closure: Definition and examples
23-L22	Exercise problems- **Allotting Portion for Internal Test I**
	Internal Test I begins(25-07-2016)
24-L23	Closure: Definition and theorem
25-L24	Limit point: Definition and examples
26-IT-1	**Internal Test-I**
27-L25	Limit point: Theorems
28-L26	Corollary of limit point
29-L27	Solved problems on limit point
30-L28	Exercise problems on limit point :**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Dense set: Definition and examples

32- L30	Dense set: Theorems and solved problems
33- L31	Completeness: Definition and note
34-P2	**College level meeting/Cell function**
35- L32	Completeness: Theorems and examples
36- L33	Theorems and solved problems Completeness
37- L34	Cantor’s intersection theorem
38- L35	Unit III- Baire’s category theorem- Definition and examples
39- L36	Baire’s category theorem and Solved problems
40- L37	Continuity- Definition, ,note, theorem and examples
41- L38	Theorems and solved problems
42- L39	Solved problems on Continuity
43- L40	Homeomorphism: Definition and examples
44- L41	Examples Continuity
45- L42	Isometric definition and examples
46- L43	Uniform continuity- Introduction , definition and note
47- L44	Solved problems on Continuity
48- L45	Discontinuous function on R
49- L46	Discontinuity function- Definition and examples
50- L47	Theorems on Discontinuity function
51- P3	**Department Seminar**
52- L48	Oscillation: Definition and examples
53- L49	Examples and theorem
54- L50	Theorem on Oscillation
55- L51	Unit IV: Connectedness: Introduction, definition and examples
56-L52	Solved problems on Connectedness - **Allotting portion for Internal Test-II**
	Internal Test II begins(22-08-2016)
57-L53	Connectedness and continuity- theorem
58-L54	Solved problems on Connectedness
59-IT-II	**Internal Test-II**
60- L55	Connected subsets of R- theorem
61- L56	Solved problems on Connectedness - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Contraction mapping theorem- Introduction
63- L58	Definition and examples Contraction mapping
64- L59	Contraction mapping theorem
65- L60	Theorem on Contraction mapping
66- L61	Unit V: Compactness- Introduction and Compact metric space-Definition and examples
67- L62	Theorems on Compactness
68- L63	Note and theorems on Compactness
69- L64	Theorems on Compactness
70- L65	Compact subset of R
71- L66	Heine Borel theorem
72- L67	Theorem on Compactness
73- L68	Equivalent characterisation for compactness- definition and examples
74-P4	**College level meeting/ function**
75- L69	Theorems on Compactness

76- L70	Totally bounded definition and examples
77- L71	Subsequence- definition and examples
78- L72	Corollary
79- L73	Sequentially compact- theorems - **Allotting portion for Internal Test-III**
	Internal Test III begins(03-10-2016)
80- L74	Theorems on Sequentially compact
81- L75	Solved problems on Sequentially compact
82-IT-III	**Internal Test-III**
83- L76	Compactness and continuity
84- L77	Note and theorems on Compactness and continuity - **Test Paper distribution and result analysis**
85- L78	Solved problems on Compactness and continuity
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (17-10-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course Real analysis
CO1	Recall elementary properties of real numbers which lead to the Archimedean property, countability and uncountability.
CO2	Predict correct choice of test and apply for test of convergence of series.
CO3	Demonstrate connectedness and correlate the relation between the space and its image under a continuous map with reference to connectedness.
CO4	Describe completeness and its relation with totally boundedness.
CO5	Describe compactness of a metric space and compile all equivalent definitions.
CO6	compare real line and metric space concepts
CO7	get a good foundation for the future studies in Analysis

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Application of Differential Equation
Course Code	**GSMA3A**
Class	Iyear (2016-2017)
Semester	Odd
Staff Name	J. Suresh Suseela
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- Mathematics will allow the students to develop a sophisticated understanding of mathematical structures and principles while gaining a wide range of skills that are attractive to employers.
- To reinforce and enhance the mathematical tools introduced earlier. Differential equation as a mathematical model for solving problems in chemistry is the central theme of the course.
- This course deals with differentiation, integration, differential equations and Laplace transform.

Syllabus

Application of Differential Equations

Text: Differential Equations and its Applications by -S.Narayanan and

T.K.ManicavachagomPillay,

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)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2016
1-L1	Unit I- Introduction on first order equation
2-L2	Introduction on Applications of first order equation
3- L3	Introduction on Growth, decay and chemical reaction
4-L4	Basic definition and some examples
5-L5	Derivation of Growth, decay and chemical reaction
6-L6	Example problems in Growth
7-L7	Example problems in Decay
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Example problems based on chemical reaction
10- L9	Exercise problems in Growth and decay
11-L10	Exercise problems in chemical reaction
12-L11	Unit II- Introduction on flow of water
13-L12	Introduction on flow of water from an orifice
14-L13	Derivation on flow of water from an orifice
15-L14	Example problems on flow of water from an orifice - **Allotting portion for Internal Test-I**
	Internal Test I begins 25-07-2016
16-L15	Exercise problems in flow of water
17-IT-1	**Internal Test-I**
18-L16	Introduction on falling bodies and other rate problems
19-L17	Derivation on freefall under gravity- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Problems based on freefall under gravity
21- L19	Derivation on retarded fall
22- P2	**College level meeting/Cell function**
23-L20	Problems based on retarded fall
24-L21	Exercise and example problems in flow of water
25-L22	Unit III Introduction on Brachistrochrome

26-L23	Brachistrochrome problems
27-L24	Derivation of Brachistrochrome
28-L25	Derivation of Brachistrochrome (conclusion)
29-L26	Solving Brachistrochrome problems
30-L27	Introduction on simple electric circuits
31-L28	Diagram and basic elements of simple electric circuits
32-L29	The properties and relation of the elements of simple electric circuits
33-L30	Derivation on simple electric circuits
34- P3	**Department Seminar**
35-L31	Example and exercise problems in simple electric circuits
36-L32	Unit IV- Introduction on variable mass- **Allotting portion for Internal Test-II**
	Internal Test II begins 22-08-2016
37- L33	Introduction on dynamical problems in variable mass
38- IT-II	**Internal Test-II**
39-L34	Derivation of dynamical problems in variable mass
40-L35	Example and exercise problems in Dynamical problems- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Introduction on Application to vibrations in mechanical systems
42- L37	Derivation on damped simple harmonic vibration
43- L38	Derivation on damped vibration
44- P4	**College level meeting/ function**
45-L39	Derivation on damped vibration
46-L40	Derivation on forced vibration
47-L41	Example and exercise problems in vibration
48-L42	**Unit V** Introduction on Newton's law
49-L43	Newton's law of gravitation
50-L44	Motion of particles derivation - **Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2016
51 L45	Introduction on central force
52- L46	Central gravitational force
53-IT-III	**Internal Test-III**
54-L47	Kepler's I and III law
55-L48	Newton's deduction from Kepler's law- **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test 17-10-2016**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course Application of Differential Equation
CO1	apply the concept of differentiation of functions
CO2	identify and apply partial differentiation to determine the maxima and minima of functions of two variables
CO3	evaluate definite and indefinite integrals
CO4	formulate and solve the first and second order differential equations
CO5	use Laplace transform techniques to solve differential equations

\

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Algebra and Differential Equations
Course Code	**JAMA11**
Class	II year(2016-2017)
Semester	Odd
Staff Name	Mrs. Hepzibah
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To know the order and degree of the ODE
- To understand the basic Theory of equations
- To study the concept of Laplace transforms
- To know the theory of matrices

Syllabus

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 Pp + Qq= R.

Unit V Laplace transformation – Inverse Laplace transform.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16.06.2017
1-L1	Introduction
2-L2	Theory of Equations
3- L3	Theory of Equations
4-L4	Theory of Equations
5-L5	Theory of Equations
6-L6	Theory of Equations
7-L7	Formation of Equations
8-L8	Formation of Equations
9-L9	Formation of Equations
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Formation of Equations
12-L11	Relation between roots and coefficients – Reciprocal equations
13-L12	Relation between roots and coefficients – Reciprocal equations
14-L13	Relation between roots and coefficients – Reciprocal equations
15-L14	Relation between roots and coefficients – Reciprocal equations
16-L15	Relation between roots and coefficients – Reciprocal equations
17-L16	Transformation of Equations
18-L17	Transformation of Equations
19-L18	Transformation of Equations
20-L19	Transformation of Equations
21-L20	Transformation of Equations
22-L21	Approximate solutions to equations
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(31.07.2017)
24-L23	Approximate solutions to equations
25-L24	Approximate solutions to equations
26-IT-1	**Internal Test-I**
27-L25	Approximate solutions to equations
28-L26	Newton’s method and Horner’s method
29-L27	Newton’s method and Horner’s method
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Newton’s method and Horner’s method
32- L30	Newton’s method and Horner’s method
33- L31	Newton’s method and Horner’s method
34-P2	**College level meeting/Cell function**
35- L32	Matrices
36- L33	Matrices
37- L34	Matrices
38- L35	Characteristic equation of a matrix
39- L36	Characteristic equation of a matrix
40- L37	Characteristic equation of a matrix

41- L38	Characteristic equation of a matrix
42- L39	Eigen values and Eigen vectors
43- L40	Eigen values and Eigen vectors
44- L41	Eigen values and Eigen vectors
45- L42	Eigen values and Eigen vectors
46- L43	Cayley Hamilton theorem and simple problems
47- L44	Cayley Hamilton theorem and simple problems
48- L45	Cayley Hamilton theorem and simple problems
49- L46	Cayley Hamilton theorem and simple problems
50- L47	Differential equation of first order but of higher degree
51- P3	**Department Seminar**
52- L48	Differential equation of first order but of higher degree
53- L49	Differential equation of first order but of higher degree
54- L50	Differential equation of first order but of higher degree
55- L51	Equations solvable for p, x, y
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(30.08.2017)
57-L53	Equations solvable for p, x, y
58-L54	Equations solvable for p, x, y
59-IT-II	**Internal Test-II**
60- L55	Equations solvable for p, x, y
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Partial differential equations
63- L58	Partial differential equations
64- L59	Partial differential equations
65- L60	formations
66- L61	formations
67- L62	formations
68- L63	solutions
69- L64	solutions
70- L65	solutions
71- L66	Standard form Pp + Qq = R
72- L67	Standard form Pp + Qq = R
73- L68	Laplace transformation
74-P4	**College level meeting/ function**
75- L69	Laplace transformation
76- L70	Laplace transformation
77- L71	Laplace transformation
78- L72	Laplace transformation
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(03.10.2017)
80- L74	Inverse Laplace transform
81- L75	Inverse Laplace transform
82-IT-III	**Internal Test-III**
83- L76	Inverse Laplace transform
84- L77	**Test Paper distribution and result analysis**
85- L78	Inverse Laplace transform

	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (19.10.2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra and Differential Equations"
CO1	Students gain the knowledge on order and degree of ODE.
CO2	Learners understand the basic Theory of equations.
CO3	Learners study the concept of Laplace transforms.
CO4	Gain knowledge on Theory of matrices.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B.Sc Mathematics
Course Name	Statistics I
Course Code	**JAST11**
Class	I year (2016-2017)
Semester	Odd
Staff Name	Mrs.T.Santhakumari
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- How to calculate and apply measures of location and measures of dispersion –grouped and ungrouped data cases.
- How to calculate correlation and regression in various business problems.
- How to apply attributes to various types of problems.
- How to apply discrete and continuous probability distributions to various business problems.
- Provide a foundation and motivation for exposure to statistical ideas subsequent to the course.

Syllabus

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Mathematics) Semester-1/Allied -1
(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.

Text Book:
Gupta .S.C and V.K. Kapoor – Fundamentals of Mathematical Statistics - (2002) Sultan Chand & Sons, New Delhi.

Books for Reference:
1. Vittal, V.R. - Mathematical Statistics (2004) Maragatham Publications
2. D.C. Sancheti&Kapoor - Statistics
3. M.L. Khanna - Statistics
4. S. Arumugam& others - Statistics

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2016
1-L1	Introduction
2-L2	Moments, Skewness and Kurtosis
3- L3	Moments, Skewness and Kurtosis
4-L4	Moments, Skewness and Kurtosis
5-L5	Curve fitting
6-L6	Curve fitting
7-L7	Curve fitting
8-L8	method of least squares
9-L9	method of least squares
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Fitting lines
12-L11	Fitting lines
13-L12	Parabolic, Exponential and Logarithmic curves
14-L13	Parabolic, Exponential and Logarithmic curves
15-L14	Parabolic, Exponential and Logarithmic curves
16-L15	Correlation and Regression
17-L16	Correlation and Regression
18-L17	Scatter Diagram
19-L18	Scatter Diagram
20-L19	Karl Pearson's coefficient ofcorrelation
21-L20	Karl Pearson's coefficient ofcorrelation
22-L21	Properties

23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(25.07.2016)
24-L23	Lines of Regression
25-L24	Lines of Regression
26-IT-1	**Internal Test-I**
27-L25	Coefficient of Regression and properties
28-L26	Coefficient of Regression and properties
29-L27	Rank Correlation
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Rank Correlation
32- L30	Association of Attributes
33- L31	Association of Attributes
34-P2	**College level meeting/Cell function**
35- L32	Consistency of data
36- L33	Consistency of data
37- L34	criteria for independence
38- L35	criteria for independence
39- L36	Yule's coefficient of Association
40- L37	Yule's coefficient of Association
41- L38	Yule's coefficient of Association
42- L39	Random variable
43- L40	Random variable
44- L41	Distribution function
45- L42	Distribution function
46- L43	properties of Distribution function
47- L44	properties of Distribution function
48- L45	properties of Distribution function
49- L46	Mathematical Expectation
50- L47	Mathematical Expectation
51- P3	**Department Seminar**
52- L48	Addition theorem of Expectation
53- L49	Addition theorem of Expectation
54- L50	Addition theorem of Expectation
55- L51	Multiplication theorem of Expectation
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(22.08.2016)
57-L53	Multiplication theorem of Expectation
58-L54	Moment generating function
59-IT-II	**Internal Test-II**
60- L55	Moment generating function
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Cumulants
63- L58	Cumulants
64- L59	characteristic function
65- L60	characteristic function
66- L61	characteristic function

67- L62	Properties of characteristic function
68- L63	Properties of characteristic function
69- L64	Discrete and continuous Probability Distributions
70- L65	Discrete and continuous Probability Distributions
71- L66	Discrete and continuous Probability Distributions
72- L67	Binomial and PoissonDistribution and their moments
73- L68	Binomial and PoissonDistribution and their moments
74-P4	**College level meeting/ function**
75- L69	Generating function, characteristic function
76- L70	Generating function, characteristic function
77- L71	Standard normal distribution and their properties
78- L72	Standard normal distribution and their properties
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(03.10.2016)
80- L74	properties and simple applications
81- L75	properties and simple applications
82-IT-III	**Internal Test-III**
83- L76	simple problems
84- L77	**Test Paper distribution and result analysis**
85- L78	simple problems
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (17.10.2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30.11.2016

Course Outcomes

Learning Outcomes	**COs** of the course “Statistics I”
CO1	Students learn the concept of measures of dispersion.
CO2	Students learn the concept of measures of central tendencies.
CO3	Gain the knowledge on probability distributions.
CO4	Gain knowledge on Concepts of Random Variables and Distributions.
CO5	Acquire knowledge on Basic Concepts of Expectation and continuous & discrete distribution.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Numerical Methods
Course Code	**JMMA5A**
Class	III year (2016-2017)
Semester	Odd
Staff Name	Mr. J. Vijaya Xavier Parthiban
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the finite differences
- To solve numerical problems by different methods

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-V/ Major ElectiveI (A)

NUMERICAL METHODS

Unit I Solution of Numerical algebraic and Transcendental Equations: bisection method – Newton‟ s method. Criterion of order of convergence of Newton’s method. Regula False method – Gauss elimination – Gauss Jacobi – Gauss Seidal method

Unit II Finite Difference: First and higher order differences – Forward and backward differences – Properties of Operator – Differences of a polynomial – Factorial polynomial – Error propagation operator E and E-1. Relation among Δ, E, δ and D

Unit III Interpolation : Newton’s Forward – backward, Gauss forward – backward interpolation formula – Bessel’s formula. Divided differences – Newton’s divided difference formula – Lagrange’s interpolation formulae – Inverse interpolation formula.

Unit IV Numerical Differentiation and Integration: Newton's forward and backward differences for differentiation – Derivatives using Bessel's formula – Trapezoidal rule, simpson's 1/3 rule & 3/8 rule – Weddle's rule.

Unit V Difference Equations: Definition – order and degree of difference equation – Linear difference equation – Finding complementary function – particular Integral – simple applications.

Text Books:

Venkataraman .M.L – Numerical methods in Science and Engineering National Publishing Company V Edition 1998.

Books for Reference:

1. Kandasamy .P.K. Thilagavathy and K. Gunavathy „Numerical Methods‟ S. Chand & Company Ltd. Edn. 2006.
2. B. Stephen John – Numerical Analysis
3. Venkatraman .M.L - Numerical methods in Science and Engineering National Publishing Company V Edition 1998.
4. Autar Kaw and Egwwn Enc Kalu - Numerical methods with Application Abidet. Autokaw.com 2nd2011.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-06-2018
1-L1	Introduction
2-L2	Solution of Numerical algebraic and Transcendental Equations
3- L3	Solution of Numerical algebraic and Transcendental Equations
4-L4	bisection method
5-L5	bisection method
6-L6	bisection method
7-L7	Newton's method
8-L8	Newton's method
9-L9	Criterion of order of convergence of Newton's method
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Criterion of order of convergence of Newton's method
12-L11	Regula False method
13-L12	Regula False method
14-L13	Gauss elimination
15-L14	Gauss elimination
16-L15	Gauss Jacobi
17-L16	Gauss Jacobi
18-L17	Gauss Seidal method
19-L18	Gauss Seidal method
20-L19	First and higher order differences
21-L20	First and higher order differences
22-L21	Forward and backward differences

23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(30-07-2018)
24-L23	Forward and backward differences
25-L24	Forward and backward differences
26-IT-1	**Internal Test-I**
27-L25	Properties of Operator
28-L26	Properties of Operator
29-L27	Differences of a polynomial
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Differences of a polynomial
32- L30	Factorial polynomial
33- L31	Factorial polynomial
34-P2	**College level meeting/Cell function**
35- L32	Error propagation operator E and E-1. Relation among Δ, E, δ and D
36- L33	Error propagation operator E and E-1. Relation among Δ, E, δ and D
37- L34	Interpolation : Newton's Forward – backward
38- L35	Interpolation : Newton's Forward – backward
39- L36	Interpolation : Newton's Forward – backward
40- L37	Gauss forward – backward interpolation formula
41- L38	Gauss forward – backward interpolation formula
42- L39	Gauss forward – backward interpolation formula
43- L40	Bessel's formula
44- L41	Bessel's formula
45- L42	Divided differences
46- L43	Newton's divided difference formula
47- L44	Newton's divided difference formula
48- L45	Lagrange's interpolation formulae
49- L46	Lagrange's interpolation formulae
50- L47	Inverse interpolation formula
51- P3	**Department Seminar**
52- L48	Inverse interpolation formula
53- L49	Newton's forward and backward differences for differentiation
54- L50	Newton's forward and backward differences for differentiation
55- L51	Derivatives using Bessel's formula
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(03-09-2018)
57-L53	Derivatives using Bessel's formula
58-L54	Trapezoidal rule, simpson's 1/3 rule & 3/8 rule – Weddle's rule.
59-IT-II	**Internal Test-II**
60- L55	Trapezoidal rule, simpson's 1/3 rule & 3/8 rule – Weddle's rule
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Trapezoidal rule, simpson's 1/3 rule & 3/8 rule – Weddle's rule
63- L58	Difference Equations **:** Definition
64- L59	order and degree of difference equation
65- L60	order and degree of difference equation
66- L61	order and degree of difference equation

67- L62	Linear difference equation
68- L63	Linear difference equation
69- L64	Linear difference equation
70- L65	Finding complementary function
71- L66	Finding complementary function
72- L67	particular Integral
73- L68	particular Integral
74-P4	**College level meeting/ function**
75- L69	particular Integral
76- L70	simple applications
77- L71	simple applications
78- L72	simple applications
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(08-10-2018)
80- L74	Problems
81- L75	Problems
82-IT-III	**Internal Test-III**
83- L76	Problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-10-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Numerical Methods”
CO1	Gaining knowledge on the finite differences.
CO2	Enable the students to solve numerical problems by different methods

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc. Mathematics
Course Name	Classical Algebra
Course Code	**JMMA12**
Class	I year (2016-2017)
Semester	Odd
Staff Name	Dr(Mrs) J. Suresh Suseela, Dr A. Alwyn Asir
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Gain the knowledge of Theory of equations .
- Understanding the concept of Powers of the roots of the equations
- To provide the understanding of Newton's method, Horner's method

Syllabus

MSU/2016-17/UG-Colleges/Part-III (B. Sc. Mathematics) Semester- I/Core-2

CLASSICAL ALGEBRA

Unit I Theory of Equations-Formation of equations-Relation between roots and Coefficients-symmetric function of the roots.

Unit II Sum of the powers of the roots of an equation-Newton's theorem, Reciprocal Equations.

Unit III Transformation of equations, Descarte's rule of signs-Rolle's theorem

Unit IV Multiple roots, Sturm's Theorem, solving appropriate solution of equations using Newton's and Horner's method.

Unit V Biquadratic equations-solution by Ferrari's method-cubic equationssolutions by Cardon's method.

Text Book:

ManickavasagamPillai .T.K and S.Narayanan – Algebra-ViswanathanPublishers and Printers Pvt.Ltd.,-2004.

Books for Reference:

1.Kandasamy P and K.Thilagavathi-Mathematics for B.Sc.,-2004,Volume I and Volume IV,S.Chand&Co.,New Delhi.
2.Arumugam.S,ThangapandiIssac-Classical Algebra,New Gamma Publishing House,Palayamkottai.
3.Burnside.W.S.and A.W.Panton-The Theory of Equations,Dublin University Press,1954.
4.MacDuffee.C.C.-Theory of Equations,John Wiley&Sons Inc.,1954.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2016
1-L1	Introduction
2-L2	Theory of Equations
3- L3	Theory of Equations
4-L4	Theory of Equations
5-L5	Formation of equations
6-L6	Formation of equations
7-L7	Formation of equations
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Relation between roots and Coefficients
10- L9	Relation between roots and Coefficients
11-L10	Relation between roots and Coefficients
12-L11	Relation between roots and Coefficients
13-L12	symmetric function of the roots
14-L13	symmetric function of the roots
15-L14	symmetric function of the roots
16-L15	symmetric function of the roots
17- L16	Sum of the powers of the roots of an equation
18- L17	Sum of the powers of the roots of an equation
19- L18	Sum of the powers of the roots of an equation
20- L19	Newton's theorem
21- L20	Problem Discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins(25.07.2016)
22- L21	Newton's theorem
23- IT-1	**Internal Test-I**
24- L22	ReciprocalEquations
25- L23	ReciprocalEquations
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal

27- L25	ReciprocalEquations
28- L26	Transformation of equations
29- L27	Transformation of equations
30- P2	**College level meeting/Cell function**
31-L28	Descarte's rule of signs
32-L29	Descarte's rule of signs
33-L30	Descarte's rule of signs
34- L31	Rolle's theorem
35- L32	Rolle's theorem
36- L33	Rolle's theorem
37- L34	Multiple roots
38- L35	Multiple roots
39- L36	Multiple roots
40- L37	Sturm's Theorem
41- L38	Multiple roots
42-P3	**Department Seminar**
43- L39	solving appropriate solution of equations usingNewton's and Horner's method.
44- L40	solving appropriate solution of equations usingNewton's and Horner's method.
45- L41	solving appropriate solution of equations usingNewton's and Horner's method.
46- L42	solving appropriate solution of equations usingNewton's and Horner's method.
47- L43	Problem Discussion - **Allotting portion for Internal Test-II**
	Internal Test II begins(22.08.2016)
48- L44	solving appropriate solution of equations usingNewton's and Horner's method.
49-IT-II	**Internal Test-II**
50-L45	Problems
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Problems
53- L48	Problems
54- L49	Biquadratic equations
55- L50	Biquadratic equations
56- L51	Biquadratic equations
57- L52	Biquadratic equations
58- L53	cubic equations solutionsby Cardon's method
59-P4	**College level meeting/ function**
60- L54	cubic equations solutionsby Cardon's method
61- L55	cubic equations solutionsby Cardon's method
62- L56	cubic equations solutionsby Cardon's method
63- L57	Problems
64- L58	Problem Discussion - **Allotting portion for Internal Test-III**
	Internal Test III begins(03.10.2016)
65- L59	Problems
66- L60	Revision
67-IT-III	**Internal Test-III**
68- L61	Problem Discussion
69- L62	Problem Discussion
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal

71-MT	**Model Test (17.10.2016)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30.11.2016

Course Outcomes

Learning Outcomes	**COs** of the course “Classical Algebra”
CO1	Enable the students to learn about the convergence and divergence of the series and to find the roots for the different types of the equations.
CO2	On successful completion of this course the students should have gained knowledge about the convergence of series and solving equations.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Mechanics
Course Code	**JMMA52**
Class	III year (2016-2017)
Semester	Odd
Staff Name	Mrs. S.Shyamala MaliniMiss. C.Henrietta Johnsy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To provide the basic knowledge of equilibrium of a particle
- To provide a basic knowledge of the behaviour of objects in motion
- To develop a working knowledge to handle practical problems

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-V/ Core - 8
MECHANICS

Unit I Forces acting at a point : Forces acting at a point – types of forces – Triangle of forces – Polygon of forces – Lami's theorem – Parallel Forces and moments – Resultant of two like parallel forces, unlike and unequal parallel forces – moment of a force – Varignon's theorem of moments.

Unit II Equilibrium of Strings and Chains : Equilibrium of strings and chains – Common catenary – Suspension bridge.

Unit III Projectiles : Projectiles : Equation of Path – Maximum height – Time of flight – Range.

Unit IV Simple Harmonic Motion : Simple harmonic motion (SHM) in a straight line – Geometrical representation – Composition of SHM‟ s of same period in the same line and along two perpendicular direction – SHM as a curve – Simple pendulum – Simple equivalent pendulum. The seconds pendulum.

Unit V Motion under the action of Central Forces : Velocity and acceleration in Polar co-ordinates – Differential equation of Central Orbit – Pedal equation of Central Orbit.

Text Books :

1) Venkataraman .M.K., - Statics, Agastiar Publications 2002, Trichy.
2) Venkataraman .M.K, -A text book on Dynamics, 2001, Agastiar Publications, Trichy.

Books for Reference :

1. Venkataraman .M.K., - Statics, Agastiar Publications 2002, Trichy.
2. Venkataraman .M.K, - A text book on Dynamics, 2001, Agastiar Publications, Trichy.
3. Duraipandian .P, Laxmi Duraipandian and Muthumizh Jayapragasam, Mechanics, 2003, S.Chand and Company.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-06-2018
1-L1	Introduction
2-L2	Simple harmonic motion (SHM) in a straight line
3- L3	Simple harmonic motion (SHM) in a straight line
4-L4	Simple harmonic motion (SHM) in a straight line
5-L5	types of forces
6-L6	Triangle of forces
7-L7	Triangle of forces
8-L8	Polygon of forces
9-L9	Polygon of forces
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Lami's theorem
12-L11	Parallel Forces and moments
13-L12	Parallel Forces and moments
14-L13	Resultant of two like parallel forces, unlike and unequal parallel forces
15-L14	Resultant of two like parallel forces, unlike and unequal parallel forces
16-L15	moment of a force
17-L16	Varignon's theorem of moments
18-L17	Equilibrium of strings and chains
19-L18	Equilibrium of strings and chains
20-L19	Equilibrium of strings and chains
21-L20	Equilibrium of strings and chains
22-L21	Common catenary
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(30-07-2018)
24-L23	Common catenary

25-L24	Common catenary
26-IT-1	**Internal Test-I**
27-L25	Suspension bridge
28-L26	Suspension bridge
29-L27	Suspension bridge
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Projectiles
32- L30	Equation of Path
33- L31	Equation of Path
34-P2	**College level meeting/Cell function**
35- L32	Maximum height
36- L33	Maximum height
37- L34	Maximum height
38- L35	Time of flight
39- L36	Time of flight
40- L37	Range
41- L38	Range
42- L39	Simple harmonic motion (SHM) in a straight line
43- L40	Simple harmonic motion (SHM) in a straight line
44- L41	Simple harmonic motion (SHM) in a straight line
45- L42	Geometrical representation
46- L43	Geometrical representation
47- L44	Composition of SHM"s of same period in the same line and along two perpendicular direction
48- L45	Composition of SHM"s of same period in the same line and along two perpendicular direction
49- L46	Composition of SHM"s of same period in the same line and along two perpendicular direction
50- L47	SHM as a curve
51- P3	**Department Seminar**
52- L48	SHM as a curve
53- L49	Simple pendulum
54- L50	Simple pendulum
55- L51	Simple equivalent pendulum. The seconds pendulum
56-L52	Problem Discussions -**Allotting portion for Internal Test-II**
	Internal Test II begins(03-09-2018)
57-L53	Simple equivalent pendulum. The seconds pendulum
58-L54	Simple equivalent pendulum. The seconds pendulum
59-IT-II	**Internal Test-II**
60- L55	Motion under the action of Central Forces
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Motion under the action of Central Forces
63- L58	Velocity and acceleration in Polar co-ordinates
64- L59	Velocity and acceleration in Polar co-ordinates
65- L60	Velocity and acceleration in Polar co-ordinates
66- L61	Velocity and acceleration in Polar co-ordinates

67- L62	Differential equation of Central Orbit
68- L63	Differential equation of Central Orbit
69- L64	Differential equation of Central Orbit
70- L65	Differential equation of Central Orbit
71- L66	Pedal equation of Central Orbit
72- L67	Pedal equation of Central Orbit
73- L68	Pedal equation of Central Orbit
74-P4	**College level meeting/ function**
75- L69	Exercise Problems
76- L70	Exercise Problems
77- L71	Exercise Problems
78- L72	Exercise Problems
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(08-10-2018)
80- L74	Revision
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Problems Discussion
84- L77	**Test Paper distribution and result analysis**
85- L78	Problems Discussion
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test(22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-10-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Mechanics”
CO1	Enable the students to realize the nature of forces and resultant forces when more than one force is acting on a particle.
CO2	On successful completion of course the students should realize the concept about the forces, resultant force of more than one force acting on a surface, friction and center of gravity. Also he can differentiate static and dynamic forces.
CO3	Enable the students with the basic knowledge of equilibrium of a particle
CO4	Enable the students to develop a working knowledge to handle practical problems
CO5	Acquire basic knowledge on the behaviour of objects in motion.
CO6	Enable the students to develop a working knowledge to handle practical problems.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Vector Calculus
Course Code	**JSMA3A**
Class	II year (2016-2017)
Semester	Odd
Staff Name	Mrs.Hebzibha
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To provide basic knowledge of vector differentiation and vector integration
- To solve problems related to that
- To explain about line integrals, surface integrals

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2017
1-L1	Intoduction
2-L2	Vector point functions
3- L3	Vector point functions
4-L4	Scalar point functions
5-L5	Scalar point functions
6-L6	Scalar point functions
7-L7	problems
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Derivative of a Vector & Derivative of sum of vectors
10- L9	Derivative of a Vector & Derivative of sum of vectors
11-L10	Derivative of product of a Scalar and Vector point function
12-L11	Derivative of product of a Scalar and Vector point function
13-L12	The vector operator „del‟ - Gradient
14-L13	The vector operator „del‟ - Gradient
15-L14	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(31.07.2017)
16-L15	Divergence
17-IT-1	**Internal Test-I**
18-L16	Divergence
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Curl, solenoidal, irrotational vectors
21- L19	Curl, solenoidal, irrotational vectors
22- P2	**College level meeting/Cell function**
23-L20	Curl, solenoidal, irrotational vectors
24-L21	Problems
25-L22	Problems
26-L23	Laplacian operator.
27-L24	Laplacian operator.
28-L25	Laplacian operator.
29-L26	Integration of point function
30-L27	Integration of point function
31-L28	Integration of point function
32-L29	Line integral
33-L30	Line integral

34- P3	**Department Seminar**
35-L31	Surface integral.
36-L32	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(30.08.2017)
37- L33	Surface integral.
38- IT-II	**Internal Test-II**
39-L34	Volume integral
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Volume integral
42- L37	Volume integral
43- L38	Gauss divergence theorem (statement only)
44- P4	**College level meeting/ function**
45-L39	Problems.
46-L40	Problems.
47-L41	Problems.
48-L42	Greens theorem and Stoke"s theorem (statements only)
49-L43	Greens theorem and Stoke"s theorem (statements only)
50-L44	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(03.10.2017)
51 L45	problems
52- L46	problems
53-IT-III	**Internal Test-III**
54-L47	problems
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test (19.10.2017)**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Vector Calculus"
CO1	Acquire basic knowledge of vector differentiation and vector integration.
CO2	Enable the students to solve problems related to that.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Statistics-II
Course Code	**SAST21**
Class	I year (2017-2018)
Semester	Even
Staff Name	Dr. S. Shyamala Malini
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To know the concept of index numbers
- To study the distribution functions
- To understand the Analysis of variance

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Allied –II

SEMESTER – II / IV
Statistics (For Mathematics Students)
Paper – II (90 Hours)

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.

Text Book:
- Gupta .S.C & V.K. Kapoor – Fundamentals of Mathematical Statistics – (2002) Sultan Chand & Sons, New Delhi.

Books for Reference :
- Vittal .P.R – Mathematical Statistic (2004) – Maragatham Publications
- DC Sancheti& Kapoor – Statistics
- M.L. Khanna – Statistics
- S. Arumugam & others – Statistics

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Characteristics of index numbers
3- L3	Laspeyer's index numbers
4-L4	Paasche's index numbers
5-L5	Bowley's index numbers
6-L6	Marshall's index numbers
7-L7	Marshall's index numbers
8-L8	Edgeworth's index numbers
9-L9	Tests-Unit test
10-P1	**Inauguration of Mathematics Association**
11-L10	Commodity reversal test
12-L11	Time reversal test, Circular test
13-L12	Unit-II Introduction

14-L13	Testing of hypothesis
15-L14	Testing of hypothesis
16-L15	Null hypothesis
17-L16	Null hypothesis
18-L17	Alternate hypothesis
19-L18	Type I errors
20-L19	Type II errors
21-L20	Critical region
22-L21	Level of significance
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
24-L23	Test of significance for large samples
25-L24	Test of significance for large samples
26-IT-1	**Internal Test-I**
27-L25	Testing a single proportion
28-L26	Testing a single proportion
29-L27	Difference of proportions
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Difference of proportions
32- L30	Testing a single mean
33- L31	Testing a single mean
34-P2	**College level meeting/Cell function**
35- L32	Difference of means
36- L33	Difference of means
37- L34	Unit-III Introduction
38- L35	Tests based on t-distribution
39- L36	Tests based on t-distribution
40- L37	single mean
41- L38	Difference of means
42- L39	Tests based on F-distribution
43- L40	Tests based on F-distribution
44- L41	Variance Ratio test
45- L42	Variance Ratio test
46- L43	Tests based on Chi-square Distribution
47- L44	Tests based on Chi-square Distribution
48- L45	Independence – Goodness of fit
49- L46	Unit-IV Introduction
50- L47	Analysis of varience
51- P3	**Department Seminar**
52- L48	Analysis of varience
53- L49	one way and two way classified data
54- L50	one way and two way classified data
55- L51	Basis of experimental design
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
57-L53	Randomized Block Design

58-L54	Randomized Block Design
59-IT-II	**Internal Test-II**
60- L55	Latin square
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Latin square
63- L58	simple problems.
64- L59	simple problems.
65- L60	Unit-V Introduction
66- L61	Statistical Quality control
67- L62	Statistical Quality control
68- L63	Statistical Quality control
69- L64	Definition – Advantages, Process control
70- L65	Definition – Advantages, Process control
71- L66	Definition – Advantages, Process control
72- L67	Definition – Advantages, Process control
73- L68	Control chart
74-P4	**College level meeting/ function**
75- L69	Mean chart
76- L70	Range chart
77- L71	P-chart
78- L72	Product Control
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
80- L74	Product Control
81- L75	Sampling Inspection Plans
82-IT-III	**Internal Test-III**
83- L76	Sampling Inspection Plans
84- L77	**Test Paper distribution and result analysis**
85- L78	Sampling Inspection Plans
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test12-04-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Statistics-II>”
CO1	Students acquire the knowledge on Basic concepts of

	Sampling and testing of Hypothesis
CO2	Learners knowledge of Testing of Hypothesis for real life problems and for small samples.
CO3	Gain knowledge about various types of Estimators
CO4	Learners learn the Concepts of Correlation and rank correlation coefficient
CO5	Gain Practical Knowledge of Correlation and Rank Correlation Coefficient, t-distribution and F-distribution
CO6	Gain knowledge on statistical quality control

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Number Theory
Course Code	**GMMA6A**
Class	III year (2017-2018)
Semester	Even
Staff Name	J. Subhashini
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The study of number theory inevitably includes knowledge of the problems and techniques of elementary number theory, however the tools which have evolved to address such problems and their generalizations are both analytic and algebraic, and often intertwined in surprising ways. This course covers topics from classical number theory including discussions of mathematical induction, prime numbers, division algorithms, congruences, and quadratic reciprocity.

Syllabus

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 theChience Reminder Theorem.

(Chapter 4: Sections 4.2 to 4.4)

Unit 5: Fermat‘s Theorem-Wilson‘s Theorem.
(Chapter 5: Sections 5.2, 5.3)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 07-12-2017
1-L1	Unit – I Introduction
2-L2	Mathematical Induction
3- L3	Well Ordering Principle
4-L4	First principle of finite induction
5-L5	First principle problems
6-L6	First principle problems
7-L7	Bernoulli’s inequality
8-L8	Second principle of induction
9-L9	Lucas sequence
10-P1	**Inauguration of Mathematics Association**
11-L10	Second principle problems
12-L11	Pascal rule
13-L12	Newton’s identity
14-L13	Binomial theorem
15-L14	Cantalan number and Problems
16-L15	Pentagonal number
17-L16	Early Number Theory
18-L17	Unit – II Division Algorithm
19-L18	Division Algorithm related Corollary , Example
20-L19	Division Algorithm related problems
21-L20	Greatest Common Divisor – Definitions , Example , Note
22-L21	Greatest Common Divisor related Theorems , Corollary
23-L22	Relatively prime , Euclidean lemma - **Allotting portion for Internal Test-I**
	Internal Test I begins (22.01.2018)
24-L23	Mathematical Induction’s Problems
25-L24	Euclidean Algorithm and GCD problems
26-IT-1	**Internal Test-I**
27-L25	Least Common Multiple – Definitions , Theorems
28-L26	Least Common Multiple – Problems
29-L27	Diophantine equation – Definitions , Theorems

30-L28	Diophantine equations Corollary - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Diophantine equation’s Examples
32- L30	Diophantine equation’s Problems
33- L31	Divisions Algorithm’s more problems
34-P2	**College level meeting/Cell function**
35- L32	Divisions Algorithm’s problems
36- L33	Unit – III Primes and their distributions
37- L34	Composite number’s definitions and theorems
38- L35	Corollary to the above theorems
39- L36	Fundamental theorem of Arithmetic
40- L37	Pythagoras theorem
41- L38	Pythagoras theorem related problems
42- L39	Pythagoras theorem related results
43- L40	The Sieve of Eratosthenes – Explanation
44- L41	The Sieve of Eratosthenes related problems
45- L42	Euclid theorem
46- L43	Euclidean number’s definition and examples
47- L44	Euclidean number’s theorems and result
48- L45	Euclidean number’s corollary
49- L46	Repunit – Definition and Theorem
50- L47	Other two theorems on repunit
51- P3	**Department Seminar**
52- L48	Twin prime – Examples and Problems
53- L49	Unit – IV Theory of Congruence
54- L50	Definitions and Theorems on Congruence
55- L51	Properties for congruence
56-L52	Problems for congruence - **Allotting portion for Internal Test-II**
	Internal Test II begins (26.02.2018)
57-L53	Congruence related problems
58-L54	Binary and decimal representation of integers
59-IT-II	**Internal Test-II**
60- L55	Binary representation related problems
61- L56	Solution of congruence – Definitions and Corollary - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Decimal expansion’s theorems and problems
63- L58	Polyndrome – Definitions and Problems
64- L59	Linear Congruence Theorem
65- L60	Problems on Linear Congruence
66- L61	Chinese Remainder Theorem
67- L62	Theorem on System of Linear Congruence
68- L63	System of Linear Congruence’s problems
69- L64	System of Linear Congruence’s problems
70- L65	Unit – V Fermat Theorem
71- L66	Corollary to Fermat Theorem
72- L67	Lemma to the above Corollary
73- L68	Wilson’s Theorem

74-P4	**College level meeting/ function**
75- L69	Quadratic Congruence's Theorem
76- L70	Fermat – Kraitchik factorisation method
77- L71	Problems on Fermat's method
78- L72	Pseudoprime – Definition and Theorems
79- L73	Absolute Pseudoprime - Definitions **- Allotting portion for Internal Test-III**
	Internal Test III begins (1.04.2018)
80- L74	Absolute Pseudoprime – Notes
81- L75	Problems on Wilson's theorems
82-IT-III	**Internal Test-III**
83- L76	Problems on Wilson's theorem
84- L77	Problems on Fermat theorem - **Test Paper distribution and result analysis**
85- L78	Problems using Fermat theorem
	Entering Internal Test-III Marks into University portal **Model test beings (12.04.2018)**
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course Number Theory
CO1	Recall the basic concepts of divisibility.
CO2	Demonstrate renowned theorems in solving congruences.
CO3	Discuss on quadratic congruence equations.
CO4	Analyse various arithmetical functions.
CO5	Identify the numbers of special form and apply divisibility rules in solving Diophantine equations.
CO6	Have an in-depth knowledge in division algorithm, Euclidean algorithm and its applications.
CO7	Understand the concept of well-ordering principle and Archimedean property.
CO8	Acquire the basic properties of congruence.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2017-2018)

(Prepared by staff member handling the course)

Programme Name	B.Sc Mathematics
Course Name	COMPLEX ANALYSIS
Course Code	**GMMA61**
Class	III year (2017-2018)
Semester	Even
Staff Name	C. Henrietta Johnsy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Complex analysis, traditionally known as the theory of functions of a complex variable, is the branch of mathematical analysis that investigates functions of complex numbers. It is useful in many branches of mathematics, including algebraic geometry, number theory, analytic combinatorics, applied mathematics; as well as in physics, including hydrodynamics and thermodynamics and also in engineering

Syllabus

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- $f(c\cos\theta,\sin\theta)d\theta$only.

(Chapter 7: Sections 7.2, 7.4 and Chapter 8: Sections 8.1 to 8.3)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	UNIT-I Functions of a complex variable
2-L2	Definition of limits
3- L3	Definition of Conjugation and modulus
4-L4	Solved problems on conjugation and modulus
5-L5	Definition of Inequality
6-L6	Definition of Square root
7-L7	Solved problems on square root
8-L8	Definition of Geometrical Representation of complex number
9-L9	Polar form of a complex number
10-P1	**Inauguration of Mathematics Association**
11-L10	Definition of n^{th} roots of complex numbers.
12-L11	Exercise problems on Geometrical Representation of complex number
13-L12	Definition of Straight lines and Circle
14-L13	Regions in the complex plane
15-L14	Example of Regions in the complex plane
16-L15	The Extended complex plane
17-L16	Solved problems on The Extended complex plane
18-L17	UNIT-II Definition of Analytic functions
19-L18	Exercise problems on Analytic functions
20-L19	Limits and definition
21-L20	Examples of limits
22-L21	Theorems on limit
23-L22	Exercise problems on limits - **Allotting portion for Internal Test-I**
	Internal Test I begins (22-01-2018)
24-L23	Definition of Continuous functions

25-L24	Definition of Differentiability
26-IT-1	**Internal Test-I**
27-L25	Exercise problems on Differentiability
28-L26	Theorem of Cauchy- Riemann Equations
29-L27	Examples of Cauchy- Riemann Equations
30-L28	Alternate form of Cauchy- Riemann Equations - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Definition of Analytic functions
32- L30	Solved problems on Analytic functions
33- L31	Definition of Harmonic functions
34-P2	**College level meeting/Cell function**
35- L32	Milne-Thompson method
36- L33	UNIT-III Definition of Bilinear transformations
37- L34	Definition of Elementary transformations
38- L35	Solved problems on Elementary transformations
39- L36	Definition of Bilinear or Mobius transformation
40- L37	Theorems on Bilinear transformations
41- L38	Solved problems on Bilinear transformations
42- L39	Definition of Cross ratio
43- L40	Solved problems on Cross ratio
44- L41	Exercise problems on Cross ratio
45- L42	Fixed points of Bilinear transformations
46- L43	Theorems on Bilinear transformations
47- L44	Solved problems on Bilinear transformations
48- L45	Exercise problems on Bilinear transformations
49- L46	UNIT-IV Definition of Definite integral
50- L47	Definition of integral
51- P3	**Department Seminar**
52- L48	Solved problems on Definite integral
53- L49	Cauchy's theorem
54- L50	Definition of Cauchy's theorem
55- L51	Cauchy's theorem for multiply connected region
56-L52	Cauchy's integral formula- **Allotting portion for Internal Test-II**
	Internal Test II begins (22-01-2018)
57-L53	Maximum Modulus theorem
58-L54	Solved problems on Maximum Modulus
59-IT-II	**Internal Test-II**
60- L55	Definition of Higher derivatives
61- L56	Liouville's Theorem- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Solved problems on Higher derivatives
63- L58	Definition ofTaylor's series
64- L59	Examples on Taylor's series
65- L60	Solved problems on Taylor's series
66- L61	Exercise problems on Taylor's series
67- L62	UNIT – V Definition of Laurent's series
68- L63	Laurent's theorem

69- L64	Solved problems on Laurent's series
70- L65	Definition of Singularities
71- L66	Examples of Singularities
72- L67	Theorem on Singularities
73- L68	Solved problems on Singularities
74-P4	**College level meeting/ function**
75- L69	Definition of Residues
76- L70	Solved problems on Residues
77- L71	Cauchy's Residue theorem
78- L72	Argument theorem
79- L73	Roche's theorem- **Allotting portion for Internal Test-III**
	Internal Test III begins (01-04-2018)
80- L74	Solved problems on Residues
81- L75	Evaluation of Definite integrals
82-IT-III	**Internal Test-III**
83- L76	Solved problems on Definite integrals
84- L77	Exercise problems on Definite integrals - **Test Paper distribution and result analysis**
85- L78	Solved problems on Definite integrals
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (12-04-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course Complex Analysis
CO1	Explain the geometry of complex numbers. Demonstrate bilinear transformation as composition of elementary transformations. Compile the relation between bilinear transformation and cross ratio.
CO2	Differentiate differentiability and analyticity. Characterize analytic function with Cauchy Riemann equations and further properties of partial derivatives.
CO3	Outline the procedure for integration of complex functions. Use Cauchy's integral formula and its consequences to prove most important theorems.
CO4	Compute power series expansion in connected region, annular region of an analytic function.
CO5	Identify different types of singularities and poles, calculate the residue. Use contour integration to find integrals of real valued functions of certain type.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	LINEAR PROGRAMMING
Course Code	**GMMA62**
Class	III year (2017-2018)
Semester	Even
Staff Name	J VIJAYA XAVIER PARITHIPAN
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- This course aims to develop students to use quantitative methods and techniques for effective decision making, mathematical model formulation and applications that are used in solving real life problems.

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07.12.2017
1-L1	Introduction of linear programming Problems
2-L2	Formation of linear programming problem.
3- L3	Solved problems in LPP.
4-L4	Exercise problem in LLPP.
5-L5	Mathematical formulation of a LPP.
6-L6	LPP in summation Notation and Matrix Form.
7-L7	Canonical form in Linear programming problem
8-L8	Remarks in LPP.
9-L9	Standard form of LPP.
10-P1	**Inauguration of Mathematics Association**
11-L10	Solved problems.
12-L11	Solved problems to find basic feasible solution.
13-L12	Theorems on basic feasible solutions.
14-L13	Theorems on basic feasible solutions.
15-L14	Notations and illustration of the problems
16-L15	Solved and exercise problems.
17-L16	Introduction of Graphical method.
18-L17	Non-negative constrains and constrains of the form ax_1+ax_2
19-L18	Optimizing objective function and its methods.
20-L19	Solved problems in Graphical method.
21-L20	Exercise problems in Graphical method.
22-L21	Introduction of Simplex method.

23-L22	Steps to solve simplex method. - **Allotting portion for Internal Test-I**
	Internal Test I begins (22.01.2018)
24-L23	Solved and exercise problems using simplex method.
25-L24	Problems based on unbounded solutions.
26-IT-1	**Internal Test-I**
27-L25	UNIT-II Introduction of Big M-method.
28-L26	Examples for the Big M- method.
29-L27	Algorithm for Big M- method.
30-L28	Solved problems in Big M- method. - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Exercise problems in Big M- method.
32- L30	Problems in Big M- method.
33- L31	Introduction to Two phase method
34-P2	**College level meeting/Cell function**
35- L32	Problems based on phase –I methods
36- L33	Problems based on phase – II methods.
37- L34	Exercise and Solved problems in 2-phase method.
38- L35	Applications of simplex method.
39- L36	Solution of simultaneous linear equations for simplex method.
40- L37	Problems based on it
41- L38	Inverting a non-singular matrix by simplex method
42- L39	Problems based on it.
43- L40	Introduction of Primal and dual.
44- L41	Lemma and remarks.
45- L42	Fundamental theorem of Duality.
46- L43	Algorithm of Dual Simplex method.
47- L44	Problems based on it.
48- L45	UNIT- III Introduction of Transportation problems.
49- L46	Mathematical formulation and Definition of TP
50- L47	Remark and Theorems in TP
51- P3	**Department Seminar**
52- L48	Dual of a Transportation problem.
53- L49	Solution algorithm for Transportation problem.
54- L50	Algorithm of North West Corner rule.
55- L51	Problems on North West Corner rule.
56-L52	Algorithm of Row Minima Method- **Allotting portion for Internal Test-II**
	Internal Test II begins (26.02.2018)
57-L53	Problems on Row Minima Method
58-L54	Algorithm of Column Minima Method
59-IT-II	**Internal Test-II**
60- L55	Problems on Column Minima Method
61- L56	Algorithm of Least Cost Method. - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems on least cost method.
63- L58	Algorithm of Vogel Approximation method.
64- L59	Problems on Vogel Approximation method.
65- L60	Determiningthe entering and leaving variable.

66- L61	Degeneracy in TP and MODI method.
67- L62	Problems based on MODI method.
68- L63	**UNIT-IV** Introducation of Assignment Problem
69- L64	Mathematical formulation and solution to assignment problem
70- L65	Hungarian Algorithm for solving Assignment problems
71- L66	Exercise and problems in Assignment problems
72- L67	Theorems and problems in Assignment problems
73- L68	UNIT-V Introduction to sequencing.
74-P4	**College level meeting/ function**
75- L69	Introduction of processing Jobs in 2 machine
76- L70	Algorithm and problems based on it.
77- L71	Introduction of processing n Jobs in m machine.
78- L72	Algorithm and problems based on it.
79- L73	Introduction of processing 2 jobs in ma machine. - **Allotting portion for Internal Test-III**
	Internal Test III begins (01.04.2018)
80- L74	Introduction of Graphical method
81- L75	Algorithm on Graphical method
82-IT-III	**Internal Test-III**
83- L76	Problems on Graphical method
84- L77	Exercise and problems - **Test Paper distribution and result analysis**
85- L78	Exercise and problems on Graphical method.
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course Linear Programming Problems
CO1	Enable the students to solve real life problems in Business Management.
CO2	Formulate Linear Programming Problem (LPP), find its solution by graphical method and identify the special cases of solution.
CO3	Predict solutions of different types of LPP using appropriate methods, namely, simplex, Big M and two-phase method.
CO4	Exploit the concept of dual simplex method and solve LPP.
CO5	Solve transportation and assignment problems using primal dual algorithm and extend it for special cases.
CO6	Propose the best strategy in a game using different decision making tools.

CO7	Demonstrate the use of simplex method in analyzing the sensitivity of the optimal solution in terms of change in the cost vector/ requirement vector/coefficient matrix/addition or deletion of variable.
CO8	Get interest in Management studies

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	MECHANICS
Course Code	**GMMA63**
Class	III year (2017-2018)
Semester	Even
Staff Name	S SHYMLALA MALINI
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The course mainly deals with two major areas of applied mathematics namely Statics and Dynamics. Statics is the branch of mechanics that is concerned with the analysis of loads (force and torque, or "moment") acting on physical systems that do not experience an acceleration (a=0), but rather, are in static equilibrium with their environment. Whereas the dynamics is a branch of applied mathematics (specifically classical mechanics) concerned with the study of forces and torques and their effect on motion. Brief introduction to central forces to the learners becomes essential as we live in the era of satellites, missiles and space explorations.

Syllabus

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: Sections10.1, 10.2)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07.12.2017
1-L1	UNIT – I Introduction
2-L2	Forces acting at a point
3- L3	Parallelogram law of forces
4-L4	Exercise Problems 1,2
5-L5	Triangle of forces
6-L6	The polygon of forces
7-L7	Lami’s theorem
8-L8	Exercise Problems
9-L9	Find the resultant of any number of coplanar places
10-P1	**Inauguration of Mathematics Association**
11-L10	Parallel forces & moments
12-L11	Unit of moment &Valigen’s theorem
13-L12	Exercise problems 1,2
14-L13	Moment of a force about on axis
15-L14	Unit – II Equilibrium of forces
16-L15	Equilibrium of three forces acting on a rigid body
17-L16	Coplanar forces
18-L17	Trignometrical theorems
19-L18	Example problem 1 , 2
20-L19	Friction laws of friction
21-L20	Coefficient and Angle of friction
22-L21	Equilibrium of a particle on a inclined plane

23-L22	Equilibrium of a particle on a inclined plane under a parallel force - **Allotting portion for Internal Test-I**
	Internal Test I begins(22.01.2018)
24-L23	Equilibrium of a body on a inclined plane under any force
25-L24	Exercise problem 3, 4
26-IT-1	**Internal Test-I**
27-L25	Problems of parallel forces
28-L26	Unit – III Projectiles introduction
29-L27	Definitions and fundamental principles
30-L28	Show that the path of the projectile is parabola -**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Characteristics of the motion of the projectile
32- L30	Worked examples 1,2
33- L31	Determine the horizontal range of a projectile
34-P2	**College level meeting/Cell function**
35- L32	Velocity of the projectile at time t
36- L33	Example problem 40, 42
37- L34	Range on an inclined plane
38- L35	Range on an inclined plane is maximum
39- L36	Time of flight
40- L37	Greatest distance S of the projectile from the inclined plane
41- L38	Time taken to reach the greatest distance
42- L39	Initial velocity of projection
43- L40	Example problems 43, 44
44- L41	Enveloping parabola
45- L42	Exercise problems 1, 2
46- L43	Unit – IV Simple harmonic motion
47- L44	SHM in a straight line
48- L45	General solution of the SHM
49- L46	Geometrical representation of SHM
50- L47	Example problem 1, 2
51- P3	**Department Seminar**
52- L48	Composition of 2 SHM of the same period in a straight line
53- L49	Composition of 2 SHM of the same period in a directions
54- L50	Example problem 22, 23
55- L51	SHM on a curve
56-L52	Period of oscillation of a simple pendulum - **Allotting portion for Internal Test-II**
	Internal Test II begins(26.02.2018)
57-L53	Simple equivalent pendulum
58-L54	Seconds pendulum
59-IT-II	**Internal Test-II**
60- L55	Loss or gain of oscillation made by a pendulum
61- L56	Example problem 27, 28 - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Unit – V motion under the action of central forces

63- L58	Velocity and acceleration in polar co-ordinates
64- L59	Example problem 1,2
65- L60	Differential equation of central orbit in polar co-ordinates
66- L61	Perpendicular from the pole on the tangent
67- L62	Pedal equation of the central orbit
68- L63	Pedal equation of standard curves
69- L64	Example problem 13, 14
70- L65	Velocities in a central orbit
71- L66	Two fold problems in central orbits
72- L67	Example problems 15, 16
73- L68	Apses and apsidal distance
74-P4	**College level meeting/ function**
75- L69	Law of the inverse square
76- L70	Example problems 34,35
77- L71	Law of the inverse principle
78- L72	SHM in a straight angle
79- L73	General solution of the SHM - **Allotting portion for Internal Test-III**
	Internal Test III begins (01.04.2018)
80- L74	Geometrical representation of SHM law
81- L75	Apses and apsidal distance
82-IT-III	**Internal Test-III**
83- L76	Two fold problems in central orbits
84- L77	Solved problems - **Test Paper distribution and result analysis**
85- L78	Exercise problems
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test12-04-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course Mechanics
CO1	Learners will gain knowledge about Mechanics of particle and Mechanics of a system of particles with constraints.
CO2	Acquisition of knowledge about D'Alembert's Principle, Lagrange's equation and Hamilton's Principle.
CO3	Outline basics that are governing system of forces.
CO4	explain the idea of couples and illustrate equilibrium of three forces acting on a rigid body in appropriate physical systems. .
CO5	Examine resultant of coplanar forces under various circumstances. Define and apply the concept of friction

CO6	Define principles of conservation of momentum and apply the concept of direct impact and oblique impact in collision of objects.
CO7	Describe the orbit of a moving particle under the action of central forces and compute moment of inertia.
CO8	Enable the students with the basic knowledge of equilibrium of a particle. Enable the students to develop a working knowledge to handle practical problems.
CO9	Knowledge gained about one-body problem, the virial theorem and the Kepler problem.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Graph Theory
Course Code	**GMMA64**
Class	III year (2017-2018)
Semester	Even
Staff Name	G.S.GRACE PREMA G.JEYA KUMAR
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- A graph is a symbolic representation of a network and of its connectivity. It implies an abstraction of the reality so it can be simplified as a set of linked nodes. Graph theory is a branch of mathematics concerned about how networks can be encoded and their properties measured. It has been enriched in the last decades by growing influences from studies of social and complex networks. The origins of graph theory can be traced to Leonhard Euler who devised in 1735 a problem that came to be known as the "Seven Bridges of Konigsberg".

Syllabus

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: Sections10.1, 10.2)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Unit-1 Introduction
2-L2	Definitions and examples of Graph
3- L3	Degrees
4-L4	Problems
5-L5	Sub graphs
6-L6	Spanning sub graph
7-L7	Definitions and examples of spanning sub graph
8-L8	Isomorphism
9-L9	Definitions of automorphism and remark
10-P1	**Inauguration of Mathematics Association**
11-L10	Ulam’s conjecture and problems
12-L11	Ramsey numbers
13-L12	Problems of Ramsey number
14-L13	Independent sets and coverings
15-L14	Intersection graphs and line graphs
16-L15	Matrices
17-L16	Operations on graphs
18-L17	Unit-2 Degree sequence
19-L18	Examples and problems
20-L19	Graphic sequences
21-L20	Definition and theorem
22-L21	Algorithm and theorem
23-L22	Definition- walk, trails and paths- **Allotting portion for Internal Test-I**
	Internal Test I begins (22-01-2018)
24-L23	Length of the walk and examples
25-L24	Theorems
26-IT-1	**Internal Test-I**
27-L25	Connected- definition and examples

28-L26	Connectedness related theorems
29-L27	Bipartite-Definition and theorems
30-L28	Definition of cut point, disconnected graph, Bridge - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Blocks- Definitions related examples
32- L30	Theorems on Blocks
33- L31	Definition of connectivity and examples
34-P2	**College level meeting/Cell function**
35- L32	Definition of n-connected, n-line connected
36- L33	Problems related k-connected graph
37- L34	Problems in k-connected graph
38- L35	Problems in k-connected graph
39- L36	Book back one words
40- L37	Unit-3 Introduction
41- L38	Definition of Eulerian and lemma
42- L39	Eulerian related theorem and corollary
43- L40	Fleury's algorithm
44-L41	Definition – Hamiltonian cycle
45- L42	Hamiltonian graph and examples
46- L43	Definition-theta graph and theorems
47- L44	Theorem –Necessary condition for a graph to be Hamiltonian
48- L45	Dirac 's theorem
49- L46	Problems for non-Hamiltonian
50- L47	Definition-Acyclic graph, Tree, examples
51- P3	**Department Seminar**
52- L48	Theorems related to tree
53- L49	Definition – spanning tree and theorem
54- L50	Definition- Eccentricity, radius r(G), examples
55- L51	Definitions-centres of G, and theorems
56-L52	Book back one word- **Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
57-L53	Unit-4 Definition- planarity and example
58-L54	Definition – Non planar and theorem
59-IT-II	**Internal Test-II**
60- L55	Theorems related to embedding plane
61- L56	Theorems-Euler's polyhedron formula- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Corollary related to plane graph
63- L58	Definition- Maximal planar, corollary
64- L59	Definition- Elementary subdivision, Homeomorphic and examples
65- L60	Problems related to homeomorphic
66- L61	Definition- Colourability, example, chromatic numb
67- L62	Definition- Chromatic partitioning, examples
68- L63	Definition- uniquely colourable, theorems
69- L64	Definition- Edge colouring, Edge chromatic number
70- L65	Theorem related to edge chromatic number

71- L66	Unit-5 Five Colour theorem
72- L67	Chromatic polynomials , theorem
73- L68	Problems related to chromatic polynomial
74-P4	**College level meeting/function**
75- L69	Definition- Directed graph, Indegree
76- L70	Definition- Isomorphism and Directed walk
77- L71	Examples
78- L72	Definitions- length, directed cycle
79- L73	Definitions- **Allotting portion for Internal Test-III (01-04-2018)**
	Internal Test III begins01-04-2018
80- L74	Definitions- reachable, unilateral
81- L75	Definition- Strongly connected and theorem
82-IT-III	**Internal Test-III**
83- L76	Definition- Eulerian trail, Eulerian
84- L77	Theorem related to Eulerian - **Test Paper distribution and result analysis**
85- L78	Definition- Eulerian trail, Eulerian
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (12-04-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course Graph Theory
CO1	Demonstrate graphs with examples and represent a graph by matrices.
CO2	Identify and construct Eulerian and Hamiltonian graphs.
CO3	Describe the properties of trees and able to examine minimal spanning tree for a given weighted graph.
CO4	discuss colouring concept of vertices and edges of a graph
CO5	Analyze planar graphs and its properties, and classify the connectedness of directed graph.
CO6	Gain the skills to apply the theory to solve various mathematical problems.
CO7	Have an in-depth knowledge of colouring and planarity.
CO8	Know the methods of representing networks in computer science and other fields.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B.Sc Mathematics
Course Name	Abstract Algebra
Course Code	**JMMA41**
Class	II year (2017-2018)
Semester	Even
Staff Name	Mrs. S.Vijila Velvet Daisy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the concept of Groups ,Ring and Field.
- To study the concept of homomorphism

Syllabus

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 IIINormal 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:
1) Arumugam .S and Tangapandi Issac .A – "Modern Algebra"scitech publications Pvt. Ltd.

Books for Reference :
1) Anton .H and C. Rorres - Elementary Linear Algebra (9th Edn) John Wiley and Sons, Inc., New York 2005.
2) Manicavasagam Pillai .T.K and others – Modern Algebra, S. Viswanathan Publishers, Chennai 1993.
3) Herstein .I.N – Topics in Algebra, Vikas Publishing Pvt. Ltd. 1975, New Delhi.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Introduction
2-L2	Groups
3- L3	Groups
4-L4	definition and Examples
5-L5	Subgroup
6-L6	order of an element
7-L7	order of an element
8-L8	centre of a group
9-L9	Normalizer and centralizer. Product of two subgroups
10-P1	**Inauguration of Mathematics Association**
11-L10	Normalizer and centralizer. Product of two subgroups
12-L11	order of HK
13-L12	Intersection and union of subgroups.
14-L13	Intersection and union of subgroups.
15-L14	Cyclic groups
16-L15	Cyclic groups
17-L16	generators of a cyclic group
18-L17	generators of a cyclic group
19-L18	Number of generators of a cyclic groups
20-L19	Number of generators of a cyclic groups
21-L20	Cosets
22-L21	Partitioning of a group by Cosets
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**

	Internal Test I begins22-01-2018
24-L23	Partitioning of a group by Cosets
25-L24	Lagrange"s theorem
26-IT-1	**Internal Test-I**
27-L25	Euler"s theorem
28-L26	Fermat"s theorem.
29-L27	Quotient groups
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Quotient groups
32- L30	Group Homomorphis
33- L31	Canonical homomorphism
34-P2	**College level meeting/Cell function**
35- L32	Canonical homomorphism
36- L33	kernel of a homomorphism
37- L34	kernel of a homomorphism
38- L35	Isomorphism
39- L36	Isomorphism
40- L37	Automorphism
41- L38	Automorphism
42- L39	Inner automorphism
43- L40	Inner automorphism
44- L41	Permutation groups
45- L42	Permutation groups
46- L43	Cayley"s theorem.
47- L44	Cayley" s theorem.
48- L45	Definition and examples
49- L46	Types of rings
50- L47	Types of rings
51- P3	**Department Seminar**
52- L48	Elementary properties of a ring
53- L49	Elementary properties of a ring
54- L50	Integral domain
55- L51	Field
56-L52	Problem Discussion - **Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
57-L53	Sub rings
58-L54	Subfields
59-IT-II	**Internal Test-II**
60- L55	Subfields
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Ideals
63- L58	Ideals
64- L59	Principal ideal
65- L60	quotient ring
66- L61	Maximal and prime ideals
67- L62	Maximal and prime ideals

68- L63	characteristic of a ring
69- L64	characteristic of a ring
70- L65	PID – UFD
71- L66	Homomorphism of rings
72- L67	Homomorphism of rings
73- L68	Isomorphism
74-P4	**College level meeting/ function**
75- L69	kernel of a homomorphism
76- L70	Fundamental theorem
77- L71	Fundamental theorem
78- L72	Field of quotients of an integral domain
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
80- L74	polynomial rings
81- L75	polynomial rings
82-IT-III	**Internal Test-III**
83- L76	Division algorithm
84- L77	**Test Paper distribution and result analysis**
85- L78	Division algorithm
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (12-04-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course "Abstract Algebra"
CO1	Acquire knowledge on the concept of Groups, Ring and Field.
CO2	Gaining knowledge on the concept of homomorphism.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Trigonometry, Laplace Transforms and Fourier Series
Course Code	**JSMA4A**
Class	II year (2017-2018)
Semester	Even
Staff Name	Dr. A.Alwyn Asir
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To understand the concept of Trigonometry
- To know the concept of Laplace transform
- To study the concept of Fourier series

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Introduction
2-L2	Expansions of sin nx, cos nx expansion
3- L3	Expansions of sin nx, cos nx expansion
4-L4	tan nx and expansions of sinnx & cosnx
5-L5	tan nx and expansions of sinnx & cosnx
6-L6	Hyperbolic functions
7-L7	Hyperbolic functions
8- P1	**Inauguration of Mathematics Association**
9- L8	Relations between hyperbolic functions and circular functions
10- L9	Relations between hyperbolic functions and circular functions
11-L10	Inverse hyperbolic functions
12-L11	Inverse hyperbolic functions
13-L12	Logarithm of complex numbers
14-L13	Logarithm of complex numbers
15-L14	Problem discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	Logarithm of complex numbers
17-IT-1	**Internal Test-I**
18-L16	Logarithm of complex numbers
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Summation of series by C + iS method
21- L19	Summation of series by C + iS method.
22- P2	**College level meeting/Cell function**
23-L20	Laplace Transforms
24-L21	Laplace Transforms

25-L22	Inverse Laplace Transforms
26-L23	Inverse Laplace Transforms
27-L24	Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms.
28-L25	Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms.
29-L26	Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms.
30-L27	Fourier Series
31-L28	Fourier Series
32-L29	Definition
33-L30	Definition
34- P3	**Department Seminar**
35-L31	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
36-L32	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
38- IT-II	**Internal Test-II**
39-L34	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Odd and even functions
42- L37	Odd and even functions
43- L38	Odd and even functions
44- P4	**College level meeting/ function**
45-L39	Half range series
46-L40	Half range series
47-L41	Half range series
48-L42	Revesion
49-L43	Revesion
50-L44	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	Problem Discussion
52- L46	Problem Discussion
53-IT-III	**Internal Test-III**
54-L47	Revesion
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test (12-04-2018)**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course "Trigonometry, Laplace Transforms and Fourier Series"
CO1	Enable the students to understand the concept of Trigonometry.
CO2	Gaining knowledge on the concept of Laplace transform.
CO3	Learners will know about the concept of Fourier series.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Operations Research-II
Course Code	**SMMA6D**
Class	III year (2017-2018)
Semester	Even
Staff Name	Dr. J. Subhashini
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives:

- To introduce Games and strategies
- To understand networking problems
- To make the students solve real life problems in business and management

Syllabus

OPERATIONS RESEARCH-II (60 Hours)

Unit I Games and Strategies : Two Person Zero sum Games – The Maximin – Minimax Principle – Games without Saddle Points – Mixed Strategies – Graphical Solution of2xnandmx2games–DominanceProperty **12L**

Unit II Replacement of items that deteriorate with time-replacement age of a machine taking money value into consideration-replacement of items that completely fail suddenyandStaffingProblems **13L**

Unit III Queing models : General concept and definitions-characteristics-properties of Poisson process Models(M/M/1: **/**FCFS), (M/M/1 : N/FCFS),(M/M/S : /FCFS) **11L**

Unit IV Network scheduling by PERT / CPM : Network and basic components – Rules of Network Construction – Time Calculation in network – Critical Path Method – PERTCalculation. **13L**

Unit V Inventory Control : Introductions – Types of Inventories – Inventory decisions – Deterministic inventory Problem– EOQ problems with shortages**.** **13L**

Text Book:

• KantiSwarup, P.K. Gupta and Manmohan – Operations Research – Sultan Chand & Sons – 2006, 12th edition.

Books for Reference :

• Gupta .P.K and D.S. Hira – Operations Research – S. Chand and Company.

• B.J. Ranganath and A.S.Srikantappa -Operations Research, Yesdee Publishing House,Chennai(2017)

• Hillier, F.S. and G.J. Lieberman - Introduction to Operations Research, 9th Ed., Tata McGrawHill, Singapore, 2009.

• Hamdy A. Taha, - Operations Research, An Introduction, 8th Ed., Prentice – Hall India, 2006.

. Hadley .G. - Linear Programming, Narosa Publishing House, New Delhi, 2002

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2018
1-L1	Unit-I Introduction
2-L2	**Games and Strategies :** Two Person Zero sum Games
3- L3	Two Person Zero sum Games
4-L4	The Maximin-Minimax Principle
5-L5	Games without Saddle Points
6-L6	Mixed Strategies
7-L7	Graphical Solution of2xnandmx2games
8- P1	**Inauguration of Mathematics Association**
9- L8	DominanceProperty
10- L9	Unit-II Introduction
11-L10	Replacementof items that deteriorate with time
12-L11	replacement age of a machine taking money value into consideration
13-L12	replacement age of a machine taking money value into consideration
14-L13	replacement of items that completely fail suddeny
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	replacement of items that completely fail suddeny
17-IT-1	**Internal Test-I**
18-L16	Staffing Problems
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal

20-L18	Staffing Problems
21- L19	Unit-III Introduction
22- P2	**College level meeting/Cell function**
23-L20	**Queing models :**General concept and definitions
24-L21	characteristics
25-L22	properties of Poisson process Models (M/M/1: /FCFS)
26-L23	properties of Poisson process Models (M/M/1 : N/FCFS)
27-L24	properties of Poisson process Models (M/M/S : /FCFS)
28-L25	Unit-IV Introduction
29-L26	**Network scheduling by PERT / CPM :** Network and basic components
30-L27	Rules of Network Construction
31-L28	Time Calculation in network
32-L29	Time Calculation in network
33-L30	Critical Path Method
34- P3	**Department Seminar**
35-L31	Critical Path Method
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	PERT Calculation.
38- IT-II	**Internal Test-II**
39-L34	Unit-V Introduction
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	**Inventory Control :** Introductions
42- L37	Types of Inventories
43- L38	Inventory decisions
44- P4	**College level meeting/ function**
45-L39	Deterministic inventory Problem
46-L40	Deterministic inventory Problem
47-L41	EOQ problems with shortage
48-L42	EOQ problems with shortage
49-L43	EOQ problems with shortage
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	Deterministic inventory Problem
52- L46	EOQ problems with shortage
53-IT-III	**Internal Test-III**
54-L47	EOQ problems with shortage
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Operations Research-II>”
CO1	Students get introduced to Games and strategies.
CO2	Enable the students to understand networking problems.
CO3	Enable the students to solve real life problems in business and management.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	For Science Students
Course Name	Vector Calculus & Fourier Series
Course Code	**SAMA21**
Class	I year (2017-2018)
Semester	Even
Staff Name	Mrs.S.Shyamala Malini
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

Vector Calculus & Fourier Series (90 Hours)

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.
Text Books:

- Dr. S. Arumugam & others – Vector Calculus

- T.K. Manicavachagom Pillai – Calculus (Vol II)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Vector differentiation
3- L3	Vector differentiation
4-L4	Vector differentiation

5-L5	Gradient
6-L6	Gradient
7-L7	Gradient
8-L8	Gradient
9-L9	Divergence and curl
10-P1	**Inauguration of Mathematics Association**
11-L10	Divergence and curl
12-L11	Divergence and curl
13-L12	Divergence and curl
14-L13	Unit-II Introduction
15-L14	Evaluation of double integrals
16-L15	Evaluation of double integrals
17-L16	Evaluation of double integrals
18-L17	Evaluation of double integrals
19-L18	Evaluation of triple integrals
20-L19	Evaluation of triple integrals
21-L20	Evaluation of triple integrals
22-L21	Evaluation of triple integrals
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins 22-01-2018
24-L23	Unit-III Introduction
25-L24	Vector integration
26-IT-1	**Internal Test-I**
27-L25	Vector integration
28-L26	Vector integration
29-L27	Vector integration
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Lineintegrals
32- L30	Line integrals
33- L31	Line integrals
34-P2	**College level meeting/Cell function**
35- L32	surface integrals
36- L33	surface integrals
37- L34	surface integrals
38- L35	volume integrals
39- L36	volume integrals
40- L37	volume integrals
41- L38	Unit-IV Introduction
42- L39	Green’s theorem
43- L40	Stokes theorem
44- L41	Divergence theorem
45- L42	simple problems
46- L43	simple problems
47- L44	simple problems
48- L45	simple problems
49- L46	simple problems
50- L47	simple problems

51- P3	**Department Seminar**
52- L48	simple problems
53- L49	simple problems
54- L50	simple problems
55- L51	Unit-V Introduction
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins 26-02-2018
57-L53	Fourier series
58-L54	Fourier series
59-IT-II	**Internal Test-II**
60- L55	Fourier series
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Fourier series
63- L58	Fourier series
64- L59	Fourier series
65- L60	Even functions
66- L61	Even functions
67- L62	Even functions
68- L63	Even functions
69- L64	Even functions
70- L65	Oddfunctions
71- L66	Odd functions
72- L67	Odd functions
73- L68	Odd functions
74-P4	**College level meeting/ function**
75- L69	Odd functions
76- L70	Odd functions
77- L71	Odd functions
78- L72	Odd functions
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins 01-04-2018
80- L74	Evaluation of double integrals
81- L75	Evaluation of triple integrals
82-IT-III	**Internal Test-III**
83- L76	Evaluation of triple integrals
84- L77	**Test Paper distribution and result analysis**
85- L78	Evaluation of double integrals
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 12-04-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Vector Calculus & Fourier Series>”
CO1	Acquiring knowledge on vector differentiation and vector integration
CO2	Gaining knowledge on evaluation of double & triple integrals.
CO3	Know about Green’s, Stokes and Divergence theorem.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Fuzzy Mathematics
Course Code	**SMMA6B**
Class	III year (2017-2018)
Semester	Even
Staff Name	Dr. J. Subhashini
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To introduce fuzzy concepts to students
- To facilitate the students to study fuzzy operations and fuzzy numbers

Syllabus

FUZZY MATHEMATICS (60 Hours)

Unit I Crisp Sets – Fuzzy Sets – Basic Types – Basic Concepts – Characteristics and Significance of the Paradigm shift. **11L**

Unit II Additional properties of α-cuts – representations of fuzzy sets – Extension principle for fuzzy sets**. 13L**

Unit III Fuzzy set operations – Fuzzy complements – Fuzzy intersections : t-norms – Fuzzy Unions : t-conorms – Combinations of operations – Aggregation operations. **11L**

Unit IV Fuzzy Numbers – Linguistic variables – Arithmetic operations on intervals – Arithmetic operations of fuzzy numbers – Lattice of fuzzy numbers – Fuzzy Equations. **13L**

Unit V Fuzzy Decision Making – Individual Decision Making – Multi-person decision making – Fuzzy linear Programming. **12L**

Text Book:

• George J. Klir and Bo Bo Yuan – Fuzzy sets and Fuzzy Logic Theory Applications, Prentice Hall of India, 2002, New Delhi.

Book for Reference:

• George J. Klir and Tina .A Folger – Fuzzy sets, uncertainty and Informations – Prentice Hall of India, 2003, New Delhi.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Crisp Sets
3- L3	Fuzzy Sets
4-L4	Basic Types
5-L5	Basic Concepts
6-L6	Characteristics of the Paradigm shift.
7-L7	Significance of the Paradigm shift.
8- P1	**Inauguration of Mathematics Association**
9- L8	Unit-II Introduction
10- L9	Additional properties of α-cuts
11-L10	Additional properties of α-cuts
12-L11	representations of fuzzy sets
13-L12	representations of fuzzy sets
14-L13	Extension principle for fuzzy sets
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	Extension principle for fuzzy sets
17-IT-1	**Internal Test-I**
18-L16	Extension principle for fuzzy sets
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Unit-III Introduction
21- L19	Fuzzy set operations
22- P2	**College level meeting/Cell function**
23-L20	Fuzzy complements
24-L21	Fuzzy intersections: t-norms
25-L22	Fuzzy Unions: t-conorms
26-L23	Combinations of operations
27-L24	Aggregation operations
28-L25	Unit-IV Introduction
29-L26	Fuzzy Numbers

30-L27	Linguistic variables
31-L28	Arithmetic operations on intervals
32-L29	Arithmetic operations of fuzzy numbers
33-L30	Arithmetic operations of fuzzy numbers
34- P3	**Department Seminar**
35-L31	Lattice of fuzzy numbers
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	Fuzzy Equations.
38- IT-II	**Internal Test-II**
39-L34	Unit-V Introduction
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Fuzzy Decision Making
42- L37	Fuzzy Decision Making
43- L38	Individual Decision Making
44- P4	**College level meeting/ function**
45-L39	Multi-person decision making
46-L40	Multi-person decision making
47-L41	Fuzzy linear Programming
48-L42	Fuzzy linear Programming
49-L43	Fuzzy linear Programming
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	Fuzzy linear Programming
52- L46	Fuzzy linear Programming
53-IT-III	**Internal Test-III**
54-L47	Fuzzy linear Programming
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Fuzzy Mathematics>”
CO1	Acquire basic knowledge on fuzzy concepts to students.
CO2	Facilitate the students to study fuzzy operations and

	fuzzy numbers.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Differential Equations
Course Code	**SMMA22**
Class	I year (2017-2018)
Semester	Even
Staff Name	Miss. C. Henrietta Johnsy
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Identify the type of a given differential equations and select and apply the appropriate analytical technique for finding the solution of first order abd selected higher order ODE
- Evaluate first order differential equations including separable, homogeneous, exact and linear.
- Solve linear systems of ordinary differential equations
- Solve differential equations using variation of parameters.

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Core - 4

DIFFERENTIAL EQUATIONS : (75 Hours)

Unit I First order higher degree equations – solvable for x,y,p and Clairaut's form – Simultaneous differential equations of the form f1(D)x+ g1(D)y = h1(t), f2(D) x + g2(D)y = h2(t)

Unit II (Ordinary differential equation) Second order linear differential equations with constant coefficients – Find the P.I for functions of the form ea*x*f(*x*) and *x*nf(*x*)

Unit III Linear equations of second order with variable coefficients – Homogeneous equations – Equation reducible to homogeneous equation.

Unit IV (Partial differential equations) Formation of equations by elimination of arbitrary constants and functions – Definition of general, particular and complete solutions – solving standard forms f(p,q) = 0, f(*x*, p, q) = 0, f(y, p, q) = 0, f(z, p, q) = 0, f(*x*, p) = f(y, q), z = p*x* + qy + f(p,q) – Lagrange's differential equations Pp + Qq= R

Unit V Application of differential equations – Growth and Decay – chemical reaction – Newton's law of cooling – Brochistocrone problem – simple electric circuits.

Text Book: Narayanan .S and T.K. Manickavachagam Pillai – Differential equations and its applications, 2003 – S. Viswanathan Printers.

Books for Reference :

- Kandasamy .P and K. Thilagavathi– Mathematics for B.Sc., Vol. III – 2004 – S.Chand and Co., New Delhi.

- Braun .M. – Differential Equations and their applications (III edition) Springer – Verlag, New York 1983)

- Boyce .W.E and R.C. Diprima – Elementary differential equations and Boundary value Problems (VII editions) – John Wiley and Sons, Inc, New York 2001.

- Sankaranarayan and Manguldoss – Differential Equations.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	First order higher degree equations
3- L3	First order higher degree equations
4-L4	First order higher degree equations
5-L5	solvable for p, x, y and Clairaut's form
6-L6	solvable for p, x, y and Clairaut's form
7-L7	solvable for p, x, y and Clairaut's form
8- P1	**Inauguration of Mathematics Association**

9- L8	Simultaneous differential equations of the form $f1(D)x + g1(D)y = h1(t)$, $f2(D)x + g2(D)y = h2(t)$
10- L9	Simultaneous differential equations of the form $f1(D)x + g1(D)y = h1(t)$, $f2(D)x + g2(D)y = h2(t)$
11-L10	Simultaneous differential equations of the form $f1(D)x + g1(D)y = h1(t)$, $f2(D)x + g2(D)y = h2(t)$
12-L11	Simultaneous differential equations of the form $f1(D)x + g1(D)y = h1(t)$, $f2(D)x + g2(D)y = h2(t)$
13-L12	Unit-II Introduction
14-L13	Linear differential equations of second order with constant coefficients
15-L14	Linear differential equations of second order with constant coefficients
16-L15	Linear differential equations of second order with constant coefficients
17- L16	Linear differential equations of second order with constant coefficients
18- L17	Linear differential equations of second order with constant coefficients
19- L18	Find the P.I for functions of the form $eaxf(x)$ and $xnf(x)$
20- L19	Find the P.I for functions of the form $eaxf(x)$ and $xnf(x)$
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
22- L21	Find the P.I for functions of the form $eaxf(x)$ and $xnf(x)$
23- IT-1	Find the P.I for functions of the form $eaxf(x)$ and $xnf(x)$
24- L22	Find the P.I for functions of the form $eaxf(x)$ and $xnf(x)$
25- L23	Find the P.I for functions of the form $eaxf(x)$ and $xnf(x)$
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Unit-III Introduction
28- L26	Linear differential equation of second order with variable coefficients
29- L27	Linear differential equation of second order with variable coefficients
30- P2	**College level meeting/Cell function**
31-L28	Linear differential equation of second order with variable coefficients
32-L29	homogeneous equations
33-L30	homogeneous equations
34- L31	homogeneous equations
35- L32	homogeneous equations
36- L33	equation reducible to homogeneous equations
37- L34	equation reducible to homogeneous equations
38- L35	equation reducible to homogeneous equations
39- L36	Unit-IV Introduction
40- L37	Formation of equations by elimination of arbitrary constants and functions
41- L38	Formation of equations by elimination of arbitrary constants and functions
42-P3	**Department Seminar**
43- L39	Formation of equations by elimination of arbitrary constants and functions
44- L40	Definition of general, particular and complete solutions
45- L41	Definition of general, particular and complete solutions
46- L42	Definition of general, particular and complete solutions
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
48- L44	Solving standard forms $f(p,q) = 0$, $f(x, p, q) = 0$, $f(y, p, q) = 0$, $f(z, p, q) = 0$, $f(x, p) = f(y, q)$, $z = px + qy + f(p,q)$

49-IT-II	**Internal Test-II**
50-L45	Lagrange's differential equations Pp + Qq= R
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Definition of general, particular and complete solutions
53- L48	Definition of general, particular and complete solutions
54- L49	Application of differential equations
55- L50	Application of differential equations
56- L51	Growth and Decay
57- L52	Growth and Decay
58- L53	Chemical reaction
59-P4	**College level meeting/ function**
60- L54	Newton's law of cooling
61- L55	Newton's law of cooling
62- L56	Brochistocrone problem
63- L57	Simple electric circuits
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
65- L59	Simple electric circuits
66- L60	Simple electric circuits
67-IT-III	**Internal Test-III**
68- L61	Brochistocrone problem
69- L62	Simple electric circuits
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test12-04-2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**Cos** of the course "<Differential Equations>"
CO1	Enables the students to learn the method of solving Differential Equations. Objectives: End of this course, the students should gain the knowledge about the method of solving Differential Equations.
CO2	It also exposes Differential Equation as a powerful tool in solving problems in Physical and Social sciences

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B Sc Mathematics
Course Name	Analytic Geometry of three dimensions
Course Code	**SMMA21**
Class	I year (2017-2018)
Semester	Even
Staff Name	1)Dr. A. Alwyn Asir
	2)Dr. J. Subhashini
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To describe the objects in three dimensions using coordinate system
- To gain some knowledge about planes in a space
- To know about lines and its properties
- Understanding the structure of spheres and intersections of known objects
- To express cones and cylinder using mathematical equations

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Core-3

ANALYTICAL GEOMETRY OF THREE DIMENSIONS: (75 Hours)

Unit I Analytical Geometry of 3D Co-ordinate system, direction cosines, direction ratios

Unit II Equation of plane in different forms - angle between planes-Length of perpendicular-angle bisection.

Unit III - Equation of a line in different forms - image of a point – image of a line-The plane and the straight line-angle between plane and line-Coplanar lines-Shortest distance between two lines
Unit IV Sphere – Tangent plane – circle of intersections – Tangency of Spheres – coaxial system of spheres - Radical Planes – Orthogonal Spheres.

Unit V Equation of a cone-cone with vertex at the orgin –Tangent plane and normal- Quadratic cone with the vertex at orgin – Right circular cone – Cylinder – Right circular cylinder-enveloping cylinder

Text Book: T.K.Manicavachagom Pillay and T.Natarajan-A text book of Analytical Geometry -Part-II Three Dimensions-S.Viswanathan(Printers&Publishers)Pvt Ltd(2012)

Books for Reference :

• Duraipandian .P. Laxmi Duraipandian and D.Muhilan - Analytical Geometry of Three Dimension - Emerald Publishers.

• Kandasamy .P. and K. Thilagavathi – Mathematics for B.Sc., Vol. IV – 2004 S.Chand and Co. New Delhi.

• Loney .S.L. - The Elements of Coordinate Geometry - Mcmillan and Company London.

• B. Stephen John - Analytical Geometry of 3D and vector differentiation : IDEAL publication.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Analytical Geometry of 3D Co-ordinate system
3- L3	Analytical Geometry of 3D Co-ordinate system
4-L4	Analytical Geometry of 3D Co-ordinate system
5-L5	direction cosines
6-L6	direction cosines
7-L7	direction cosines
8- P1	**Inauguration of Mathematics Association**
9- L8	direction ratios
10- L9	direction ratios
11-L10	direction ratios
12-L11	Unit-II Introduction
13-L12	Equation of plane in different forms
14-L13	Equation of plane in different forms
15-L14	Equation of plane in different forms
16-L15	Angle between planes

17- L16	Angle between planes
18- L17	Angle between planes
19- L18	Length of perpendicular
20- L19	Length of perpendicular
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
22- L21	Angle bisection
23- IT-1	**Internal Test-I**
24- L22	Angle bisection
25- L23	Unit-III Introduction
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Equation of a line in different forms
28- L26	Equation of a line in different forms
29- L27	Image of a point
30- P2	**College level meeting/Cell function**
31-L28	Image of a line
32-L29	The plane and the straight line
33-L30	The plane and the straight line
34- L31	Angle between plane and line
35- L32	Angle between plane and line
36- L33	Angle between plane and line
37- L34	Coplanar lines
38- L35	Coplanar lines
39- L36	Coplanar lines
40- L37	Shortest distance between two lines
41- L38	Shortest distance between two lines
42-P3	**Department Seminar**
43- L39	Shortest distance between two lines
44- L40	Unit-IV Introduction
45- L41	Sphere
46- L42	Tangent plane
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
48- L44	circle of intersections
49-IT-II	**Internal Test-II**
50-L45	Tangency of Spheres
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Coaxial system of spheres
53- L48	Coaxial system of spheres
54- L49	Radical Planes
55- L50	Radical Planes
56- L51	Orthogonal Spheres
57- L52	Orthogonal Spheres
58- L53	Unit-V Introduction
59-P4	**College level meeting/ function**
60- L54	Equation of a cone

61- L55	Equation of a cone
62- L56	Cone with vertex at the orgin
63- L57	Cone with vertex at the orgin
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
65- L59	Tangent plane and normal-Quadratic cone with the vertex at orgin
66- L60	Right circular cone – Cylinder
67-IT-III	**Internal Test-III**
68- L61	Right circular cylinder-Enveloping cylinder
69- L62	Right circular cylinder-Enveloping cylinder
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test12-04-2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Analytic Geometry of three dimensions>”
CO1	Enable the students to learn and visualize the fundamental ideas about co-ordinate geometry.
CO2	On successful completion of the course students should have gained knowledge about the regular geometrical figures and their properties

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Numerical Methods
Course Code	**SMMA65**
Class	III year (2017-2018)
Semester	Even
Staff Name	Dr. J. Vijaya Xavier Parthipan
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To introduce the finite differences
- To solve numerical problems by different methods

Syllabus

NUMERICAL METHODS (60 Hours)

Unit I Solution of Numerical algebraic and Transcendental Equations : bisection method – Newton‟ s method. Criterion of order of convergence of Newton‟ s method. Regula False method – Gauss elimination – Gauss Jacobi – Gauss Seidal method **13L**

Unit II Finite Difference : First and higher order differences – Forward and backward differences – Properties of Operator – Differences of a polynomial – Factorial Polynomial **11L**

Unit III Interpolation :Newton‟ s Forward – backward, Gauss forward – backward interpolation formula – Bessel‟ s formula. Divided differences – Newton‟ s divided difference formula – Legrange‟ s interpolation formule**11L**

Unit IV Numerical Differentation and Integration : Newtons forward and backward differences for differentiation – Derivatives using Bessel‟ s formula – Trapezoidal rule, simpson‟ s 1/3 rule & 3/8 rule **13L**

Unit V Difference Equations : Definition – order and degree of difference equation – Linear difference equation – Finding complementary function – particular Integral –simpleapplications. **12L**

Text Book:

• Venkatraman .M.L - Numerical methods in Science and Engineering National Publishing Company V Edition 1998

Books for Reference :

• Kandasamy .P.K. Thilagavathy and K. Gunavathy „Numerical Methods‟ S. Chand & Company Ltd. Edn. 2006.

• B. Stephen John – Numerical Analysis

• Autar Kaw and Egwwn Enc Kalu - Numerical methods with Application Abidet. Autokaw.com 2nd 2011.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	bisection method
3- L3	bisection method
4-L4	Newton‟s method
5-L5	Newton‟s method
6-L6	Criterion of order of convergence of Newton‟s method
7-L7	Regula False method
8- P1	**Inauguration of Mathematics Association**
9- L8	Regula False method
10- L9	Gauss elimination method
11-L10	Gauss Jacobi method
12-L11	Gauss Seidal method
13-L12	Unit-II Introduction
14-L13	**Finite Difference :**First and higher order differences
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins 22-01-2018
16-L15	Forward and backward differences
17-IT-1	**Internal Test-I**
18-L16	Properties of Operator
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Differences of a polynomial
21- L19	Factorial Polynomial

22- P2	**College level meeting/Cell function**
23-L20	Unit-III Introduction
24-L21	Interpolation : Newton's Forward interpolation formula
25-L22	Newton's Backward interpolation formula
26-L23	Gauss forward interpolation formula
27-L24	Gauss backward interpolation formula
28-L25	Bessel's formula
29-L26	Divided differences
30-L27	Newton's divided difference formula
31-L28	Legrange's interpolation formula
32-L29	Unit-IV Introduction
33-L30	Newtons forward differences for differentiation
34- P3	**Department Seminar**
35-L31	Newtons backward differences for differentiation
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins 26-02-2018
37- L33	Derivatives using Bessel's formula
38- IT-II	**Internal Test-II**
39-L34	Trapezoidal rule
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Simpson's 1/3 rule & 3/8 rule
42- L37	Unit-VIntroduction
43- L38	**Difference Equations :**Definition
44- P4	**College level meeting/ function**
45-L39	order and degree of difference equation
46-L40	Linear difference equation
47-L41	Finding complementary function
48-L42	particular Integral
49-L43	Simple applications.
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins 01-04-2018
51 L45	Simple applications.
52- L46	Simple applications.
53-IT-III	**Internal Test-III**
54-L47	Simple applications.
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test 12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Numerical Methods >”
CO1	Gaining knowledge on the finite differences.
CO2	Enable the students to solve numerical problems by different methods.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Complex Analysis
Course Code	**SMMA61**
Class	III year (2017-2018)
Semester	Even
Staff Name	Miss. C. Henrietta Johnsy
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

Complex analysis, traditionally known as the theory of functions of a complex variable, is the branch of mathematical analysis that investigates functions of complex numbers. It is useful in many branches of mathematics, including algebraic geometry, number theory, analytic combinatorics, applied mathematics; as well as in physics, including hydrodynamics and thermodynamics and also in engineering

Syllabus

COMPLEX ANALYSIS (75 Hours)

Unit I (Analytic functions) Functions of a complex variable – Derivatives – Cauchy – Riemann equations – sufficient conditions – Polar form – Analytic functions – Harmonic functions**. 13L**
Unit II (Integrals) Definite integrals – Contours – Cauchy – Goursat theorem – antiderivatives and independence of path – Cauchy Integral formula – Morera" s theorem. **17L**
Unit III (Series) Taylor" s series – Examples – Laurent" s series – Zeros of analytic functions – Residues – Residue theorem – Principal part of functions – Residues at poles. **16L**

Unit IV (Evaluation of Integrals) Evaluation of improper real integrals – improper integrals involving sines and cosines – Definite integrals involving sines and coines**. 14L**

Unit V (Transformations) Conformal mappings–basic properties–Bilinear maps – fixed points – Applications 1**5L**

Text Book:

• Arumugam.S and T. Issac – "Complex Analysis" – Scitech Publishing House – Chennai

Books for Reference :

• Churchill .R.V. and J.W. Brown – "Complex variables and Applications" – IV edition – McGraw Hill International Editions.

• Ponnuswamy .S – "Foundations of Complex Analysis", Narosa Publication House, New Delhi, II edition 2005.

• Duraipandian .P and Lakshmi Duraipandian – "Complex Analysis" – Emerald Publications, Chennai (2001)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	**(Analytic functions)** Functions of a complex variable
3- L3	Functions of a complex variable
4-L4	Derivatives
5-L5	Derivatives
6-L6	Derivatives
7-L7	Cauchy – Riemann equations
8- P1	**Inauguration of Mathematics Association**
9- L8	Cauchy – Riemann equations
10- L9	sufficient conditions
11-L10	Polar form
12-L11	Polar form
13-L12	Analytic functions
14-L13	Harmonic functions
15-L14	Unit-II Introduction
16-L15	**(Integrals)** Definite integrals
17- L16	Definite integrals
18- L17	Definite integrals
19- L18	Contours theorem
20- L19	Cauchy's theorem
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
22- L21	Goursat's theorem
23- IT-1	**Internal Test-I**
24- L22	antiderivatives
25- L23	antiderivatives

26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	independence of path
28- L26	Cauchy Integral formula
29- L27	Cauchy Integral formula
30- P2	**College level meeting/Cell function**
31-L28	Morera's theorem.
32-L29	Unit-III Introduction
33-L30	**(Series)** Taylor's series
34- L31	Taylor's series
35- L32	Examples
36- L33	Laurent's series
37- L34	Zeros of analytic functions
38- L35	Zeros of analytic functions
39- L36	Residues
40- L37	Residues
41- L38	Residue theorem
42-P3	**Department Seminar**
43- L39	Residue theorem
44- L40	Principal part of functions
45- L41	Principal part of functions
46- L42	Residues at poles
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
48- L44	Residues at poles
49-IT-II	**Internal Test-II**
50-L45	Unit-IV Introduction
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Evaluation of improper real integrals
53- L48	Evaluation of improper real integrals
54- L49	improper integrals involving sines and cosines
55- L50	improper integrals involving sines and cosines
56- L51	Definite integrals involving sines and coines
57- L52	Definite integrals involving sines and coines
58- L53	Unit-V Introduction
59-P4	**College level meeting/ function**
60- L54	**(Transformations)** Conformal mappings
61- L55	Conformal mappings
62- L56	basic properties
63- L57	basic properties
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
65- L59	Bilinear maps
66- L60	Bilinear maps
67-IT-III	**Internal Test-III**
68- L61	fixed points
69- L62	Applications

70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test12-04-2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**Cos** of the course "<Complex Analysis>"
CO1	Enable the students to understand the functions of complex variables
CO2	Students will obtain knowledge about elementary transformations, concepts in complex variables.
CO3	Enable the students to understand the singularity concepts and residues.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Number Theory
Course Code	**SMMA62**
Class	III year (2017-2018)
Semester	Even
Staff Name	MrsW. Rajammal Ranjitha Mary
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

The study of number theory inevitably includes knowledge of the problems and techniques of elementary number theory, however the tools which have evolved to address such problems and their generalizations are both analytic and algebraic, and often intertwined in surprising ways. This course covers topics from classical number theory including discussions of mathematical induction, prime numbers, division algorithms, congruences, and quadratic reciprocity

Syllabus

NUMBER THEORY (60 Hours)

Unit I Peano" s Axioms – Mathematical Induction – The Binomial Theorem – Early NumberTheory. **11L**

Unit II Division Algorithm – GCD – Euclidean Algorithm – The Diaphantine Equation ax+by=c. **12L**

Unit III The fundamental Theorem of Arithmetic – The Sieve of Eratosthenes – The Goldbach conjecture. **13L**

Unit IV Basis properties of congruences – Linear congruence and the Chinese Remainder Theorem. **11L**

Unit V Fermat" s Theorem – Wilson" s Theorem – The Fermat – Kraitchik Factorization Method. **13L**

Text Book:
• David .M. Burton - Elementary Number Theory (Sixth Edition) Tata McGraw Hill Education Pvt. Ltd.

Books for Reference :
• Ivan Niven and H, Zuckerman - An Introduction to Theory of Numbers.
• Kumaravelu .S, and Susheela Kumaravelu - Elements Theory - Nagercoil, 2002.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Peano"s Axioms
3- L3	Peano"s Axioms
4-L4	Mathematical Induction
5-L5	Mathematical Induction
6-L6	The Binomial Theorem
7-L7	The Binomial Theorem
8- P1	**Inauguration of Mathematics Association**
9- L8	Early Number Theory
10- L9	Early Number Theory
11-L10	Early Number Theory
12-L11	Unit-II Introduction
13-L12	Division Algorithm
14-L13	Division Algorithm
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	GCD
17-IT-1	**Internal Test-I**
18-L16	GCD
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Euclidean Algorithm
21- L19	Euclidean Algorithm
22- P2	**College level meeting/Cell function**
23-L20	The Diaphantine Equation ax+by=c.
24-L21	The Diaphantine Equation ax+by=c.
25-L22	The Diaphantine Equation ax+by=c.

26-L23	Unit-III Introduction
27-L24	The fundamental Theorem of Arithmetic
28-L25	The fundamental Theorem of Arithmetic
29-L26	The Sieve of Eratosthenes
30-L27	The Goldbach conjecture.
31-L28	The Goldbach conjecture.
32-L29	Unit-IV Introduction
33-L30	Basic properties of congruences
34- P3	**Department Seminar**
35-L31	Basic properties of congruences
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	Linear congruence
38- IT-II	**Internal Test-II**
39-L34	Linear congruence
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Chinese Remainder Theorem.
42- L37	Unit-V Introduction
43- L38	Fermat’s Theorem
44- P4	**College level meeting/ function**
45-L39	Fermat’s Theorem
46-L40	Wilson’s Theorem
47-L41	Wilson’as Theorem
48-L42	The Fermat – Kraitchik Factorization Method
49-L43	The Fermat – Kraitchik Factorization Method
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	The Fermat – Kraitchik Factorization Method
52- L46	The Fermat – Kraitchik Factorization Method
53-IT-III	**Internal Test-III**
54-L47	The Fermat – Kraitchik Factorization Method
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Number Theory>”
CO1	Enable the students to highlight the beauties in the world of numbers.
CO2	Students get prepared for coding through congruence.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Graph Theory
Course Code	**SMMA63**
Class	III year (2017-2018)
Semester	Even
Staff Name	1)Dr. G. S. Grace Prema
	2)Dr. S. Shyamala Malini
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Graph Theory is an integral part of Discrete Mathematics and has applications indiversified areas such as Electrical Engineering, Computer science, Linguistics
- Study the basic concepts of Graph theory such as Trees, connectivity, tour, trail, cycles, etc.
- To understand the ideas of matchings and colourings in graphs and some of its applications
- Illustration on ramsey number of a graph and Ramsey’s graph with recursion formula to calculate ramsey number
- To explain the concepts of independent number and cliques of a graph and its results

Syllabus

GRAPH THEORY (75 Hours)

Unit I: Definition and examples of graphs – degrees – subgraphs – isomorphism – independent sets and coverings – matrices – operation on graphs. **18L**
Unit II: Degree sequences – graphic sequences – walks – trails and paths – connectedness and components – connectivity. **18L**

Unit III: Eulerian graphs – Hamiltonian graphs – characterisation of trees – centre of a tree**. 13L**

Unit IV: Definition and properties of planar graphs – chromatic number and chromatic index **13L.**

Unit V: Chromatic polynomials – definition and basic properties of digraphs – paths and connectedness in digraphs**. 13L**

Text book: Arumugam,S and S. Ramachandran – Invitation to graph Theory, Scitech publications, Chennai.

Books for reference:
• Kumaravelu. S and SusheelaKumaravelu – Graph theory.

• Narasingh Deo – Graph theory with application to engineering and computer science, Prentice – Hall of indiapvt. Ltd., New Delhi.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Definition and examples of graphs
3- L3	Definition and examples of graphs
4-L4	degrees
5-L5	degrees
6-L6	subgraphs
7-L7	subgraphs
8- P1	**Inauguration of Mathematics Association**
9- L8	isomorphism
10- L9	isomorphism
11-L10	independent sets
12-L11	coverings
13-L12	coverings
14-L13	matrices
15-L14	operation on graphs.
16-L15	Unit-II Introduction
17- L16	Degree sequences
18- L17	Degree sequences
19- L18	graphic sequences

20- L19	graphic sequences
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
22- L21	walks – trails and paths
23- IT-1	**Internal Test-I**
24- L22	connectedness and components
25- L23	connectedness and components
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	connectivity
28- L26	Unit-III Introduction
29- L27	Eulerian graphs
30- P2	**College level meeting/Cell function**
31-L28	Eulerian graphs
32-L29	Hamiltonian graphs
33-L30	Hamiltonian graphs
34- L31	characterisation of trees
35- L32	characterisation of trees
36- L33	centre of a tree
37- L34	centre of a tree
38-L35	centre of a tree
39- L36	Unit-IV Introduction
40- L37	Definition and properties of planar graphs
41- L38	Definition and properties of planar graphs
42-P3	**Department Seminar**
43- L39	chromatic number
44- L40	chromatic number
45- L41	chromatic number
46- L42	chromatic index
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
48- L44	chromatic index
49-IT-II	**Internal Test-II**
50-L45	chromatic index
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Unit-V Introduction
53- L48	Chromatic polynomials
54- L49	Chromatic polynomials
55- L50	Chromatic polynomials
56- L51	definition and basic properties of digraphs
57- L52	definition and basic properties of digraphs
58- L53	definition and basic properties of digraphs
59-P4	**College level meeting/ function**
60- L54	paths and connectedness in digraph
61- L55	paths and connectedness in digraph
62- L56	paths and connectedness in digraph
63- L57	paths and connectedness in digraph

64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
65- L59	Exercise problem
66- L60	Exercise problem
67-IT-III	**Internal Test-III**
68- L61	Exercise problem
69- L62	Exercise problem
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test12-04-2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**Cos** of the course “<Graph Theory>”
CO1	Learners will know about the notion of graph theory and its applications.
CO2	Acquisition of knowledge on the techniques of combinatorics in graph theory

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Dynamics
Course Code	**SMMA64**
Class	III year (2017-2018)
Semester	Even
Staff Name	Dr. S. Shyamala Malini
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To provide a basic knowledge of the behaviour of objects in motion
- To develop a working knowledge to handle practical problems

Syllabus

DYNAMICS (60 Hours)

Unit I : Projectiles- Equation of path – range – maximum height- time of flight- range on an inclined plane-problems. **14L**

Unit II : Collision of elastic bodies- Laws of impact- direct and oblique impact-Problems. **11L**

Unit III : Simple Harmonic Motion (SHM) in a straighrt line- Geometrical representation – composition of SHM"s of the same period in the same line and along two perpendicular directions – problems**. 13L**

Unit IV : Motion under the action of central forces – velocity and acceleration in polar co-ordinates – problems. **10L**

Unit V : DifferentialEquation of central orbit - pedal equation of central orbit – problems to find the law of force towards the pole when the orbit is given. **12L**

Text Book: Venkatraman, M.K. - A Text Book on Dynamics, Agasthiar Publication, Trichy.

Books for Reference:

1. Narayanan, S- Dynamics, S.Chand & company, 16th Edition,1986, New Delhi.

2. Duraipandiyan, P, Laxmi Duraipandian and Muthamiz Jayaprgasam- Mechanics 2003, S.Chand & Company.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Projectiles
3- L3	Equation of path
4-L4	Equation of path
5-L5	range
6-L6	range
7-L7	maximum height
8- P1	**Inauguration of Mathematics Association**
9- L8	time of flight
10- L9	range on an inclined plane
11-L10	Problems
12-L11	Unit-II Introduction
13-L12	Collision of elastic bodies
14-L13	Collision of elastic bodies
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	Laws of impact
17-IT-1	**Internal Test-I**
18-L16	direct and oblique impact
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	direct and oblique impact
21- L19	Problems
22- P2	**College level meeting/Cell function**
23-L20	Unit-III Introduction
24-L21	Simple Harmonic Motion (SHM) in a straight line
25-L22	Simple Harmonic Motion (SHM) in a straight line
26-L23	Geometrical representation
27-L24	Geometrical representation
28-L25	Composition of SHM‟s of the same period in the same line and along two perpendicular directions
29-L26	problems
30-L27	problems
31-L28	Unit-IV Introduction
32-L29	Motion under the action of central forces
33-L30	Motion under the action of central forces
34- P3	**Department Seminar**

35-L31	velocity and acceleration in polar co-ordinates
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	problems
38- IT-II	**Internal Test-II**
39-L34	Unit-V Introduction
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Differential Equation of central orbit
42- L37	Differential Equation of central orbit
43- L38	pedal equation of central orbit
44- P4	**College level meeting/ function**
45-L39	pedal equation of central orbit
46-L40	problems to find the law of force towards the pole when the orbit is given
47-L41	problems to find the law of force towards the pole when the orbit is given
48-L42	problems to find the law of force towards the pole when the orbit is given
49-L43	Problems
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	problems
52- L46	problems
53-IT-III	**Internal Test-III**
54-L47	problems
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Dynamics>”
CO1	Acquire basic knowledge on the behaviour of objects in motion.
CO2	Enable the students to develop a working knowledge to handle practical problems.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Dynamics
Course Code	**SMMA64**
Class	III year (2017-2018)
Semester	Even
Staff Name	Dr. S. Shyamala Malini
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To provide a basic knowledge of the behaviour of objects in motion
- To develop a working knowledge to handle practical problems

Syllabus

DYNAMICS (60 Hours)

Unit I : Projectiles- Equation of path – range – maximum height- time of flight- range on an inclined plane-problems. **14L**

Unit II : Collision of elastic bodies- Laws of impact- direct and oblique impact-Problems. **11L**

Unit III : Simple Harmonic Motion (SHM) in a straighrt line- Geometrical representation – composition of SHM‟s of the same period in the same line and along two perpendicular directions – problems**. 13L**

Unit IV : Motion under the action of central forces – velocity and acceleration in polar co-ordinates – problems. **10L**

Unit V : DifferentialEquation of central orbit - pedal equation of central orbit – problems to find the law of force towards the pole when the orbit is given. **12L**

Text Book: Venkatraman, M.K. - A Text Book on Dynamics, Agasthiar Publication, Trichy.

Books for Reference:

1. Narayanan, S- Dynamics, S.Chand & company, 16th Edition,1986, New Delhi.

2. Duraipandiyan, P, Laxmi Duraipandian and Muthamiz Jayaprgasam- Mechanics 2003, S.Chand & Company.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Projectiles
3- L3	Equation of path
4-L4	Equation of path
5-L5	range
6-L6	range
7-L7	maximum height
8- P1	**Inauguration of Mathematics Association**
9- L8	time of flight
10- L9	range on an inclined plane
11-L10	Problems
12-L11	Unit-II Introduction
13-L12	Collision of elastic bodies
14-L13	Collision of elastic bodies
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	Laws of impact
17-IT-1	**Internal Test-I**
18-L16	direct and oblique impact
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	direct and oblique impact
21- L19	Problems
22- P2	**College level meeting/Cell function**
23-L20	Unit-III Introduction
24-L21	Simple Harmonic Motion (SHM) in a straight line
25-L22	Simple Harmonic Motion (SHM) in a straight line
26-L23	Geometrical representation
27-L24	Geometrical representation
28-L25	Composition of SHM"s of the same period in the same line and along two perpendicular directions
29-L26	problems
30-L27	problems
31-L28	Unit-IV Introduction
32-L29	Motion under the action of central forces
33-L30	Motion under the action of central forces
34- P3	**Department Seminar**

35-L31	velocity and acceleration in polar co-ordinates
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	problems
38- IT-II	**Internal Test-II**
39-L34	Unit-V Introduction
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Differential Equation of central orbit
42- L37	Differential Equation of central orbit
43- L38	pedal equation of central orbit
44- P4	**College level meeting/ function**
45-L39	pedal equation of central orbit
46-L40	problems to find the law of force towards the pole when the orbit is given
47-L41	problems to find the law of force towards the pole when the orbit is given
48-L42	problems to find the law of force towards the pole when the orbit is given
49-L43	Problems
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	problems
52- L46	problems
53-IT-III	**Internal Test-III**
54-L47	problems
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Dynamics>”
CO1	Acquire basic knowledge on the behaviour of objects in motion.
CO2	Enable the students to develop a working knowledge to handle practical problems.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Trigonometry, Laplace Transforms & Fourier series
Course Code	**SSMA4A**
Class	II year (2017-2018)
Semester	Even
Staff Name	1)Dr. G. Jeya Kumar
	2)Dr. A. Alwyn Asir
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives:

- To understand the concept of Trigonometry
- To know the concept of Laplace transform
- To study the concept of Fourier series

Syllabus

TRIGONOMETRY, LAPLACE TRANSFORMS AND FOURIER SERIES

(60 Hours)

Unit I Trigonometry : Expansions of sin nx, cos nx, tan nx and expansions of sinnx&cosnx**. 10L**

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. **13L**

Unit III Laplace Transforms – Inverse Laplace Transforms**. 13L**

Unit IV Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms. **12L**

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. **12L**

Text Books: Arumugam .S and TangapandiIssac .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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Expansions of sin nx, cos nx, tan nx
3- L3	Expansions of sin nx, cos nx, tan nx
4-L4	Expansions of sin nx, cos nx, tan nx
5-L5	Expansions of sin nx, cos nx, tan nx
6-L6	expansions of $\sin^n x$&$\cos^n x$
7-L7	expansions of $\sin^n x$&$\cos^n x$
8- P1	**Inauguration of Mathematics Association**
9- L8	expansions of $\sin^n x$&$\cos^n x$
10- L9	Unit-II Introduction
11-L10	Hyperbolic functions
12-L11	Hyperbolic functions
13-L12	Relations between hyperbolic functions and circular functions
14-L13	Relations between hyperbolic functions and circular functions
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
16-L15	Inverse hyperbolic functions
17-IT-1	**Internal Test-I**
18-L16	Inverse hyperbolic functions
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Logarithm of complex numbers
21- L19	Logarithm of complex numbers

22- P2	**College level meeting/Cell function**
23-L20	Summation of series by C + iS method
24-L21	Summation of series by C + iS method
25-L22	Unit-III Introduction
26-L23	Laplace Transforms
27-L24	Laplace Transforms
28-L25	Laplace Transforms
29-L26	Inverse Laplace Transforms
30-L27	Inverse Laplace Transforms
31-L28	Inverse Laplace Transforms
32-L29	Unit-IV Introduction
33-L30	Solving linear differential equations with constant coefficients
34- P3	**Department Seminar**
35-L31	Solving linear differential equations with constant coefficients
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
37- L33	Solving linear differential equations with constant coefficients
38- IT-II	**Internal Test-II**
39-L34	Solvingsimultaneous equations using Laplace Transforms
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Solvingsimultaneous equations using Laplace Transforms
42- L37	Solvingsimultaneous equations using Laplace Transforms
43- L38	Solvingsimultaneous equations using Laplace Transforms
44- P4	**College level meeting/ function**
45-L39	Unit-V Introduction
46-L40	Fourier Series – Definition
47-L41	Fourier Series – Definition
48-L42	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
49-L43	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
51 L45	Odd and even functions
52- L46	Odd and even functions
53-IT-III	**Internal Test-III**
54-L47	Half range series
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test12-04-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course "<Trigonometry, Laplace Transforms & Fourier series>"
CO1	Enable the students to understand the concept of Trigonometry
CO2	Gaining knowledge on the concept of Laplace transform
CO3	Learners will know about the concept of Fourier series

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Abstract Algebra-I
Course Code	**SSMA41**
Class	II year (2017-2018)
Semester	Even
Staff Name	Mrs. S. Vijila Velvet Daisy
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the concept of Groups ,Ring and Field.
- To study the concept of homomorphism

Syllabus

ABSTRACT ALGEBRA-I (90 Hours)

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. **18L**

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 **16L**

Unit III Normal subgroups : Quotient groups – Group Homomorphis – Canonical homomorphism – kernel of a homomorphism – Isomorphism –

Automorphism – Inner automorphism – Permutation groups – Cayley‟ s theorem**. 20L**
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**. 18L**

Unit V Homomorphism of rings – Isomorphism – kernel of a homomorphism – Fundamental theorem – Field of quotients of an integral domain – polynomial rings – Division algorithm **18L**

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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit-I Introduction
2-L2	Groups – definition and Examples
3- L3	Groups – definition and Examples
4-L4	Groups – definition and Examples
5-L5	Subgroup – order of an element
6-L6	Subgroup – order of an element
7-L7	Subgroup – order of an element
8-L8	Subgroup – order of an element
9-L9	centre of a group – Normalizer and centralizer
10-P1	**Inauguration of Mathematics Association**
11-L10	centre of a group – Normalizer and centralizer
12-L11	centre of a group – Normalizer and centralizer
13-L12	Product of two subgroups and order of HK
14-L13	Product of two subgroups and order of HK
15-L14	Product of two subgroups and order of HK
16-L15	Intersection and union of subgroups
17-L16	Intersection and union of subgroups
18-L17	Intersection and union of subgroups

19-L18	Unit-II Introduction
20-L19	Cyclic groups
21-L20	Cyclic groups
22-L21	Generators of a cyclic group
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
24-L23	Number of generators of a cyclic groups
25-L24	Number of generators of a cyclic groups
26-IT-1	**Internal Test-I**
27-L25	Cosets – Partitioning of a group by Cosets
28-L26	Cosets – Partitioning of a group by Cosets
29-L27	Cosets – Partitioning of a group by Cosets
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Lagrange‟s theorem – Euler‟s theorem
32- L30	Lagrange‟s theorem – Euler‟s theorem
33- L31	Fermat‟s theorem
34-P2	**College level meeting/Cell function**
35- L32	Unit-III Introduction
36- L33	Quotient groups
37- L34	Quotient groups
38- L35	Group Homomorphis
39- L36	Group Homomorphis
40- L37	Canonical homomorphism
41- L38	Canonical homomorphism
42- L39	Kernel of a homomorphism
43- L40	Kernel of a homomorphism
44- L41	Isomorphism – Automorphism
45- L42	Kernel of a homomorphism
46- L43	Isomorphism – Automorphism
47- L44	Inner automorphism
48- L45	Inner automorphism
49- L46	Permutation groups
50- L47	Permutation groups
51- P3	**Department Seminar**
52- L48	Cayley's theorem
53- L49	Unit-IV Introduction
54- L50	Definition and examples
55- L51	Definition and examples
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
57-L53	Types of rings and Elementary properties of a ring
58-L54	Types of rings and Elementary properties of a ring
59-IT-II	**Internal Test-II**
60- L55	Integral domain – Field – Sub rings
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Integral domain – Field – Sub rings

63- L58	Subfields – Ideals – Principal ideal
64- L59	Integral domain – Field – Sub rings
65- L60	Subfields – Ideals – Principal ideal
66- L61	Quotient ring – Maximal and prime ideals
67- L62	Quotient ring – Maximal and prime ideals
68- L63	Quotient ring – Maximal and prime ideals
69- L64	Characteristic of a ring – PID – UFD
70- L65	Characteristic of a ring – PID – UFD
71- L66	Characteristic of a ring – PID – UFD
72- L67	Unit-V Introduction
73- L68	Homomorphism of rings – Isomorphism
74-P4	**College level meeting/ function**
75- L69	Homomorphism of rings – Isomorphism
76- L70	kernel of a homomorphism
77- L71	Fundamental theorem – Field of quotients of an integral domain
78- L72	Fundamental theorem – Field of quotients of an integral domain
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins01-04-2018
80- L74	Fundamental theorem – Field of quotients of an integral domain
81- L75	Polynomial rings
82-IT-III	**Internal Test-III**
83- L76	Division algorithm
84- L77	**Test Paper distribution and result analysis**
85- L78	Division algorithm
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test12-04-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Abstract Algebra-I>”
CO1	Acquire knowledge on the concept of Groups, Ring and Field.
CO2	Gaining knowledge on the concept of homomorphism

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Real Analysis-I
Course Code	**SMMA31**
Class	II year (2017-2018)
Semester	Odd
Staff Name	Mrs. S. Vijila Velvet Daisy
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To lay a god foundation of classical analysis
- To study the behaviour of sequences and series

Syllabus

CORE PAPER –V

REAL ANALYSIS – I (90 Hours)

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**. 11L**

Unit II Sequences : Bounded sequences – monotonic sequences – convergent sequences – divergent and oscillating sequences – The algebra of limits. **17L**

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**. 19L**

Unit IV Series : Infinite series – nth term test – Comparison test – Kummer" s test – D" Alemberls ratio test – Raabe" s test - Gauss test – Root test **23L**
Unit V Alternating series – Leibnitz" s test - Tests for convergence of series of arbitrary terms – Multiplication of series- Abel's Throrem-Mertens theorem-Power Series-Radius of convergence **20L**

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

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2018
1-L1	Unit-I Introduction
2-L2	The field of axioms, the order axioms
3- L3	The field of axioms, the order axioms
4-L4	The rational numbers, the irrational numbers
5-L5	The rational numbers, the irrational numbers
6-L6	Upper bounds, maximum element, least upper bound (supremum)
7-L7	Upper bounds, maximum element, least upper bound (supremum)
8-L8	The completeness axiom, absolute values
9-L9	The completeness axiom, absolute values
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	The triangle inequality. Cauchy – Schwartz's inequality.
12-L11	The triangle inequality. Cauchy – Schwartz's inequality.
13-L12	The triangle inequality. Cauchy – Schwartz's inequality.
14-L13	Unit-II Introduction
15-L14	Bounded sequences
16-L15	Bounded sequences
17-L16	Monotonic sequences
18-L17	Monotonic sequences
19-L18	Convergent sequences
20-L19	Convergent sequences

21-L20	Convergent sequences
22-L21	Divergent and oscillating sequences
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins
24-L23	Divergent and oscillating sequences
25-L24	The algebra of limits
26-IT-1	**Internal Test-I**
27-L25	The algebra of limits
28-L26	Unit-III Introduction
29-L27	Behaviour of monotonic sequences
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Behaviour of monotonic sequences
32- L30	Cauchy's first limit theorem
33- L31	Cauchy's first limit theorem
34-P2	**College level meeting/Cell function**
35- L32	Cauchy's second limit theorem
36- L33	Cauchy's second limit theorem
37- L34	Cesaro's theorem
38- L35	Cesaro's theorem
39- L36	Subsequences
40- L37	Subsequences
41- L38	Subsequences
42- L39	Cauchy sequence
43- L40	Cauchy sequence
44- L41	Cauchy sequence
45- L42	Unit-IV Introduction
46- L43	Infinite series
47- L44	Infinite series
48- L45	Infinite series
49- L46	nth term test
50- L47	nth term test
51- P3	**Department Seminar**
52- L48	Comparison test
53- L49	Comparison test
54- L50	Kummer's test
55- L51	Kummer's test
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins
57-L53	D'Alemberls ratio test
58-L54	D'Alemberls ratio test
59-IT-II	**Internal Test-II**
60- L55	Raabe's test
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Raabe's test
63- L58	Gauss test
64- L59	Gauss test

65- L60	Root test
66- L61	Root test
67- L62	Unit-V Introduction
68- L63	Alternating series
69- L64	Alternating series
70- L65	Leibnitz’s test
71- L66	Leibnitz’s test
72- L67	Tests for convergence of series of arbitrary terms
73- L68	Tests for convergence of series of arbitrary terms
74-P4	**College level meeting/ function**
75- L69	Multiplication of series
76- L70	Multiplication of series
77- L71	Abel's Throrem
78- L72	Mertens theorem
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins
80- L74	Power Series
81- L75	Radius of convergence
82-IT-III	**Internal Test-III**
83- L76	Radius of convergence
84- L77	**Test Paper distribution and result analysis**
85- L78	Radius of convergence
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Real Analysis-I>”
CO1	Enable the students with a good foundation of classical analysis.
CO2	Learners will obtain the knowledge on behaviour of sequences and series

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Classical Algebra
Course Code	**SMMA12**
Class	I year (2017-2018)
Semester	Odd
Staff Name	Dr. A. Alwyn Asir
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Gain the knowledge of theory of equations.
- Understanding the concept of Powers of the roots of the equations
- To provide the understanding of Newton's method, Horner's method

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – I / Core - 2

CLASSICAL ALGEBRA (75 Hours)

Unit I Theory of Equations – Formation of equations – Relation between roots and coefficients – symmetric function of the roots.

Unit II Sum of the powers of the roots of an equation – Newton's theorem, Reciprocal Equations.

Unit III Transformation of equations, Descarte's rule of signs – Rolle's theorem

Unit IV Multiple roots, Sturm's Theorem, solving appropriate solution of equations using Newton's and Horner's method.

Unit V Biquadratic equations – solution by Ferrari's method – cubic equations – solutions by Cardon's method.

Text Book: Manickavasagam Pillai .T.K and S. Narayanan - Algebra – Viswanathan Publishers and Printers Pvt. Ltd., - 2004.

Books for Reference :

- Kandasamy P and K. Thilagavathi - Mathematics for B.Sc., - 2004, Volume I and Volume IV, S. Chand & Co., New Delhi.
- Arumugam .S, ThangapandiIssac – Classical Algebra, New Gamma Publishing House, Palayamkottai.
- Burnside, W.S. and A.W. Panton - The Theory of Equations, Dublin University Press, 1954.
- MacDuffee, C.C. - Theory of Equations, John Wiley & Sons Inc., 1954.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2017
1-L1	Unit-I Introduction
2-L2	Theory of equations
3- L3	Theory of equations
4-L4	Formation of equations
5-L5	Formation of equations
6-L6	Relation between roots and coefficients of equations
7-L7	Relation between roots and coefficients of equations
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Relation between roots and coefficients of equations
10- L9	symmetric function of the roots
11-L10	symmetric function of the roots
12-L11	symmetric function of the roots
13-L12	Unit-II Introduction
14-L13	Sum of the rthpowers of the roots of an equation
15-L14	Sum of the rthpowers of the roots of an equation
16-L15	Sum of the rthpowers of the roots of an equation
17- L16	Newton's theorem
18- L17	Newton's theorem
19- L18	Newton's theorem
20- L19	Reciprocal equations
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins 31-07-2017
22- L21	Reciprocal equations
23- IT-1	**Internal Test-I**
24- L22	Unit-III Introduction
25- L23	Transformation of Equations
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Transformation of Equations
28- L26	Transformation of Equations
29- L27	Descarte's rule of signs
30- P2	**College level meeting/Cell function**
31-L28	Descarte's rule of signs

32-L29	Descarte's rule of signs
33-L30	Rolle's theorem
34- L31	Rolle's theorem
35- L32	Rolle's theorem
36- L33	Unit-IV Introduction
37- L34	Multiple roots
38- L35	Multiple roots
39- L36	Multiple roots
40- L37	Multiple roots
41- L38	Sturm's Theorem
42-P3	**Department Seminar**
43- L39	Sturm's Theorem
44- L40	Solving appropriate solution of equations using Newton's and Horner's method
45- L41	Solving appropriate solution of equations using Newton's and Horner's method
46- L42	Solving appropriate solution of equations using Newton's and Horner's method
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins 30-08-2017
48- L44	Solving appropriate solution of equations using Newton's and Horner's method
49-IT-II	**Internal Test-II**
50-L45	Unit-V Introduction
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Biquadratic equations
53- L48	Biquadratic equations
54- L49	Biquadratic equations
55- L50	solution by Ferrari's method
56- L51	solution by Ferrari's method
57- L52	solution by Ferrari's method
58- L53	cubic equations
59-P4	**College level meeting/ function**
60- L54	cubic equations
61- L55	Solutions by Cardon's method
62- L56	Solutions by Cardon's method
63- L57	Solutions by Cardon's method
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2017
65- L59	problems
66- L60	problems
67-IT-III	**Internal Test-III**
68- L61	problems
69- L62	problems
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test 19-10-2017**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**

75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course "<Classical Algebra>"
CO1	Enable the students to learn about the convergence and divergence of the series and to find the roots for the different types of the equations.
CO2	On successful completion of this course the students should have gained knowledge about the convergence of series and solving equations.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Vector Calculus
Course Code	**SSMA3A**
Class	II year (2017-2018)
Semester	Odd
Staff Name	Dr. A. Alwyn Asir
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives:

- To provide basic knowledge of vector differentiation and vector integration
- To solve problems related to that

Syllabus

VECTOR CALCULUS (60 Hours)

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 **13L**

Unit II Divergence – Curl, solenoidal, irrotational vectors – Laplacian operator**. 12L**

Unit III Integration of point function – Line integral – Surface integral**, 13L**

Unit IV Volume integral – Gauss divergence theorem (statement only) – Problems. **12L**

Unit V Greens theorem and Stoke" s theorem (statements only) – problems. **10L**

Text Book:

• DuraiPandian.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, (4^{th}Edn.) Pearson Education, Boston 2012.

• Anil Kumar Sharma, - Text book of Vector Calculus, Discovery Publishing House, 1993.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-06-2017
1-L1	Unit-I Introduction
2-L2	Vector point functions
3- L3	Vector point functions
4-L4	Scalar point functions
5-L5	Scalar point functions
6-L6	Derivative of a Vector & Derivative of sum of vectors
7-L7	Derivative of a Vector & Derivative of sum of vectors
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Derivative of a Vector & Derivative of sum of vectors
10- L9	Derivative of product of a Scalar and Vector point function
11-L10	Derivative of product of a Scalar and Vector point function
12-L11	The vector operator 'del'
13-L12	The vector operator 'del'
14-L13	Gradient
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins 31-07-2017
16-L15	Gradient
17-IT-1	**Internal Test-I**
18-L16	Unit-II Introduction
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Divergence
21- L19	Divergence
22- P2	**College level meeting/Cell function**
23-L20	Curl, solenoidal, irrotational vectors
24-L21	Curl, solenoidal, irrotational vectors
25-L22	Laplacian operator

26-L23	Laplacian operator
27-L24	Unit-III Introduction
28-L25	Integration of point function
29-L26	Integration of point function
30-L27	Integration of point function
31-L28	Line integral
32-L29	Line integral
33-L30	Line integral
34- P3	**Department Seminar**
35-L31	Surface integral
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins 30-08-2017
37- L33	Surface integral
38- IT-II	**Internal Test-II**
39-L34	Unit-IV Introduction
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Volume integral
42- L37	Volume integral
43- L38	Gauss divergence theorem (statement only)
44- P4	**College level meeting/ function**
45-L39	Gauss divergence theorem (statement only)
46-L40	Problems
47-L41	Problems
48-L42	Unit-V Introduction
49-L43	Greens theorem and Stoke's theorem
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2017
51 L45	Greens theorem and Stoke's theorem
52- L46	Problems
53-IT-III	**Internal Test-III**
54-L47	Problems
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test 19-10-2017**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**Cos** of the course “<Vector Calculus>”
CO1	Acquire basic knowledge of vector differentiation and vector integration
CO2	Enable the students to solve problems related to that

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	For Science Students
Course Name	Algebra & Differential Equations
Course Code	**SAMA11**
Class	I year (2017-2018)
Semester	Odd
Staff Name	Mrs.V.Selvan
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

Algebra and Differential Equations (90 Hours)

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 Pp + Qq= R.
Unit V Laplace transformation – Inverse Laplace transform.
Text book:
• Dr. S. Arumugam & others – Allied Mathematics – I

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2017
1-L1	Unit-I Introduction
2-L2	Theory of Equations
3- L3	Theory of Equations
4-L4	Theory of Equations

5-L5	Formation of Equations
6-L6	Formation of Equations
7-L7	Formation of Equations
8-L8	Relation between roots and coefficients
9-L9	Relation between roots and coefficients
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Reciprocal equations.
12-L11	Reciprocal equations.
13-L12	Reciprocal equations.
14-L13	Unit-II Introduction
15-L14	Transformation of Equations
16-L15	Transformation of Equations
17-L16	Transformation of Equations
18-L17	Approximate solutions to equations
19-L18	Approximate solutions to equations
20-L19	Approximate solutions to equations
21-L20	Newton's method and Horner's method.
22-L21	Newton's method and Horner's method.
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins 31-07-2017
24-L23	Newton's method and Horner's method.
25-L24	Unit-III Introduction
26-IT-1	**Internal Test-I**
27-L25	Matrices
28-L26	Matrices
29-L27	Matrices
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Matrices
32- L30	Characteristic equation of a matrix
33- L31	Characteristic equation of a matrix
34-P2	**College level meeting/Cell function**
35- L32	Eigen values and Eigen vectors
36- L33	Eigen values and Eigen vectors
37- L34	Eigen values and Eigen vectors
38- L35	Cayley Hamilton theorem
39- L36	simple problems.
40- L37	simple problems.
41- L38	simple problems.
42- L39	Unit-IV Introduction
43- L40	Differential equation of first order but of higher degree
44- L41	Differential equation of first order but of higher degree
45- L42	Differential equation of first order but of higher degree
46- L43	Equations solvable for p, x, y
47- L44	Equations solvable for p, x, y
48- L45	Equations solvable for p, x, y
49- L46	Partial differential equations
50- L47	Partial differential equations

51- P3	**Department Seminar**
52- L48	Partial differential equations
53- L49	formations
54- L50	formations
55- L51	solutions
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins 30-08-2017
57-L53	solutions
58-L54	solutions
59-IT-II	**Internal Test-II**
60- L55	Standard form Pp + Qq= R.
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Standard form Pp + Qq= R.
63- L58	Unit-V Introduction
64- L59	Laplace transformation
65- L60	Laplace transformation
66- L61	Laplace transformation
67- L62	Laplace transformation
68- L63	Laplace transformation
69- L64	Inverse Laplace transform.
70- L65	Inverse Laplace transform.
71- L66	Inverse Laplace transform.
72- L67	Inverse Laplace transform.
73- L68	Inverse Laplace transform.
74-P4	**College level meeting/ function**
75- L69	Inverse Laplace transform.
76- L70	Problems
77- L71	Problems
78- L72	Problems
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2017
80- L74	Problems
81- L75	Problems
82-IT-III	**Internal Test-III**
83- L76	Problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 19-10-2017**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	COs of the course “<Algebra & Differential Equations>”
CO1	Learners study the concept of Laplace transforms.
CO2	Gain knowledge on Theory of matrices

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Real Analysis I
Course Code	**JMMA31**
Class	II year (2017-2018)
Semester	Odd
Staff Name	Mrs.S.Vijila Velvet Daisy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Learn to work with logarithmic, exponential, and inverse trigonometric functions.
- Learn to work with infinite sequences and series.
- Learn to work with infinite sequence is bounded.
- Learn to work with an infinite sequence is monotonic.
- Learn to work with an infinite sequence is convergent or divergent.
- Find the sequence of partial sums of an infinite series.

Syllabus

MSU/2016-17/UG-Colleges /Part-III (B.Sc. Mathematics)/ Semester-III/ Ppr.no.15/ Core-5

REAL ANALYSIS - I

Unit I 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 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 Infinite series – nth term test – Comparison test – Kummer‟s test – D‟Alemberls ratio test – Raabe‟s test - Gauss test – Root test – Canchy‟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 – Maclaurins series.

Text Books:
1) Arumugam .S and Thengapandi Issac – "sequences and series", New Gamma publishing House, Palayamkottai – 627 002.
2) 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

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2017
1-L1	Introduction
2-L2	The field of axioms, the order axioms, the rational numbers.
3- L3	The field of axioms, the order axioms, the rational numbers.
4-L4	the irrational numbers, upper bounds, maximum element, least upper bound (supremum)
5-L5	the irrational numbers, upper bounds, maximum element, least upper bound (supremum)
6-L6	The completeness axiom, absolute values, the triangle inequality.
7-L7	The completeness axiom, absolute values, the triangle inequality.
8-L8	Cauchy – schwartz‟s inequality.
9-L9	Cauchy – schwartz‟s inequality.
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Bounded sequences
12-L11	Bounded sequences
13-L12	monotonic sequences
14-L13	monotonic sequences
15-L14	convergent sequences
16-L15	convergent sequences
17-L16	convergent sequences
18-L17	divergent and oscillating sequences
19-L18	divergent and oscillating sequences
20-L19	divergent and oscillating sequences
21-L20	The algebra of limits.
22-L21	The algebra of limits.
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins (31.07.2017)
24-L23	Behaviour of monotonic sequences
25-L24	Behaviour of monotonic sequences
26-IT-1	**Internal Test-I**
27-L25	Cauchy‟s first limit theorem
28-L26	Cauchy‟s first limit theorem
29-L27	Cauchy‟s first limit theorem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Cauchy‟s second limit theorem

32- L30	Cauchy"s second limit theorem
33- L31	Cesaro"s theorem
34-P2	**College level meeting/Cell function**
35- L32	Cesaro"s theorem
36- L33	subsequences
37- L34	subsequences
38- L35	Cauchy sequence
39- L36	Cauchy sequence
40- L37	Cauchy"s general principle of convergence.
41- L38	Cauchy"s general principle of convergence.
42- L39	Cauchy"s general principle of convergence.
43- L40	Infinite series
44- L41	Infinite series
45- L42	nth term test
46- L43	Comparison test
47- L44	Comparison test
48- L45	Kummer"s test
49- L46	Kummer"s test
50- L47	Kummer"s test
51- P3	**Department Seminar**
52- L48	D"Alemberls ratio test
53- L49	D"Alemberls ratio test
54- L50	Raabe"s test
55- L51	Raabe"s test
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins (30.08.2017)
57-L53	Gauss test
58-L54	Root test
59-IT-II	**Internal Test-II**
60- L55	Canchy"s condensation test (without proof)
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Alternating series
63- L58	Alternating series
64- L59	Leibnitz"s test
65- L60	Leibnitz"s test
66- L61	Leibnitz"s test
67- L62	Tests for convergence of series of arbitrary terms
68- L63	Tests for convergence of series of arbitrary terms
69- L64	Tests for convergence of series of arbitrary terms
70- L65	Power series
71- L66	Power series
72- L67	Taylor"s series
73- L68	Taylor"s series
74-P4	**College level meeting/ function**
75- L69	Maclaurins series.
76- L70	Maclaurins series.
77- L71	Maclaurins series.

78- L72	Class Test
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins (03.10.2017)
80- L74	Revision
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (19.10.2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Real Analysis I"
CO1	Enable the students with a good foundation of classical analysis.
CO2	Learners will obtain the knowledge on behaviour of sequences and series.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Combinatorial Mathematics
Course Code	**GMMA5B**
Class	III year (2017-2018)
Semester	Odd
Staff Name	G.S.GRACE PREMA G.JEYA KUMAR
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

Combinatorics is a branch of mathematics concerning the study of finite or countable discrete structures. Aspects of combinatorics include counting the structures of a given kind and size (enumerative combinatorics), deciding when certain criteria can be met, and constructing and analyzing objects meeting the criteria. Many combinatorial questions have historically been considered in isolation, giving an adhoc solution to a problem arising in some mathematical context. In the later twentieth century, however, powerful and general theoretical methods were developed, making combinatorics into an independent branch of mathematics in its own right. Combinatorics is used frequently in computer science to obtain formulas and estimates in the analysis of algorithms

Syllabus

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)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2017
1-L1	Unit-1 Introduction
2-L2	Definition for colourings and examples
3- L3	Theorem for colouring
4-L4	Recurrence relation- definitions, examples and problems
5-L5	Permutation-Definition, Theorems
6-L6	Permutation related problems
7-L7	Definition for p(n,r) and problems
8-L8	Combination definition
9-L9	Combination related theorems and problems
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Pascal's identity theorem
12-L11	Problems for Binomial theorem
13-L12	Exponential-Definition and theorem
14-L13	Problems on permutation
15-L14	Exercise problems of permutation
16-L15	Unit-2 Pairings definitions and examples
17-L16	Definition- vertices, edges, graph and example
18-L17	Perfect matching definitions
19-L18	Perfect matching examples
20-L19	Perfect matching Theorem
21-L20	Pairing between sets
22-L21	Hall's theorem on distinct representation or Assignment of Marriage theorem
23-L22	Latin square-Definitions and examples- **Allotting portion for Internal Test-I**
	Internal Test I begins (31-07-2017)
24-L23	Problems on Latin squares
25-L24	Latin rectangle-Definitions and examples
26-IT-1	**Internal Test-I**
27-L25	Hungarian Algorithm for solving assignment
28-L26	Assignment problems
29-L27	Balanced Assignment problems
30-L28	Unbalanced Assignment problems - **Test Paper distribution and result**

	analysis
	Entering Internal Test-I Marks into University portal
31- L29	Unbalanced Assignment problems
32- L30	Travelling salesman problem
33- L31	Travelling salesman problems
34-P2	**College level meeting/Cell function**
35- L32	Unit-3 Recurrence relation- Definition and examples
36- L33	Solving the recurrence relation
37- L34	Problems on recurrence relation
38- L35	Problems on recurrence relation
39- L36	Problems on recurrence relation
40- L37	Derivation of Fibonacci relation
41- L38	The problems of derangements-Definitions and problems
42- L39	Another formulation for derangement
43- L40	Partition of an integer, tree-Definitions and examples
44- L41	Degree of vertex, simple tree, rooted simple tree-definitions and examples
45- L42	Rooted simple tree's problems
46- L43	The generating function for rooted simple tree
47- L44	Problems on generating function for rooted simple tree
48- L45	Possible number of colouring problems
49- L46	Unit-4 The inclusion- exclusion principle
50- L47	Theorem for $\lvert A\cup B \cup c\rvert\ and \lvert A \cup B \cup C \cup D\rvert$
51- P3	**Department Seminar**
52- L48	Problems on inclusion –exclusion principle
53- L49	Problems on inclusion-exclusion principle
54- L50	Rook Polynomial-definition
55- L51	Rook polynomial problems
56-L52	Rook polynomial problems- **Allotting portion for Internal Test-II**
	Internal Test II begins (30-8-2017)
57-L53	Rook polynomial for 4x4 board and 8x8 board
58-L54	Non-interfering definitions and theorem
59-IT-II	**Internal Test-II**
60- L55	Another theorem of non-interfering
61- L56	Rook polynomial problems- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems on Rook polynomial
63- L58	Rook polynomial for 6x6 Latin square
64- L59	Rook polynomial for5x5 Latin square
65- L60	Problems on Rook polynomial
66- L61	Problems on Rook polynomial
67- L62	problems on Rook polynomial
68- L63	Unit-5 Block designs, Block -definition
69- L64	Matrix representation for Block designs
70- L65	Properties of the incident matrix
71- L66	Incident matrix problem
72- L67	Incident matrix problem
73- L68	Block design related theorem
74-P4	**College level meeting/ function**

75- L69	Properties of 7 point plane
76- L70	Incident matrix problem
77- L71	Fisher's theorem
78- L72	Note for incidence matrix
79- L73	Square Block design –Definition, properties and theorem - **Allotting portion for Internal Test-III**
	Internal Test III begins (30.8.2017)
80- L74	Theorem for square block design
81- L75	Finite projective plane definition and notes
82-IT-III	**Internal Test-III**
83- L76	Properties of finite projective plane
84- L77	Finite projective place related lemmas and theorem - **Test Paper distribution and result analysis**
85- L78	Hadamard matrix- definitions and examples
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (19-10-2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course Combinatorial Mathematics
CO1	Demonstrate effectively the addition and multiplication principles and use it for counting.
CO2	Use generating functions and the concept of partition to solve combinatorial problems.
CO3	Model recurrence relations using different techniques for real time counting problems and find solutions.
CO4	Outline special counting numbers such as Fibonacci number, Stirling numbers, catalan number and Menage number.
CO5	Design a new counting principle called inclusion and exclusion principle and use it for counting problems.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature　　　　　　　　　　　　　　　　　　　　　　　　Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	CODING THEORY
Course Code	**GMMA5E**
Class	I year (2017-2018)
Semester	Odd
Staff Name	J. Subhasini
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

.

- Learners get introduced to coding and decoding concepts.
- Train the students in the field of coding theory.

Syllabus

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 wordtransmitted.

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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2017
1-L1	Unit-1 Coding theory Introduction, word
2-L2	List all the words of lengths and examples
3- L3	Basic assumption about the channel
4-L4	Correcting and deleting error batterns
5-L5	Problem 1,2,3,4,5,6 in correcting and detecting error batterns
6-L6	Information rate
7-L7	Finding the most likely codeword transmitted and problems
8-L8	Theorem
9-L9	Some basic Algebra and examples and problems in basic algebra
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Weight and Distance (Add some distance problems)
12-L11	Maximum likelihood Decoding
13-L12	Reliability of Maximum Likelihood Decoding
14-L13	Error detecting codes
15-L14	Distance of the codes
16-L15	Unit-2 Linear codes
17-L16	Exercise problems in linear codes
18-L17	Two important subspaces- Linear scalar product (or) Dot product
19-L18	Orthogonal vector. Orthogonal to the set
20-L19	Linear Independence, example problems
21-L20	Basic examples and exercise
22-L21	Dimension –examples and exercise
23-L22	Matrices and exercises problems- **Allotting portion for Internal Test-I**
	Internal Test I begins (31.07.2017)
24-L23	Elementary Row operation Leading one and leading column
25-L24	Row Echelon form (REF), Reduced Row Echelon form (PREF)
26-IT-1	**Internal Test-I**
27-L25	Bases for c= $< s >$ and c⊥ $examples\ and\ exercise$
28-L26	Algorithm and examples and exercise problems
29-L27	Algorithm for finding the basis
30-L28	Generating Matrices-Example and exercise problems- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Encoding and exercise
32- L30	Unit-3 parity – check Matrices
33- L31	Theorem 2.7.1
34-P2	**College level meeting/Cell function**
35- L32	Theorems on parity
36- L33	Exercise problems in parity check matrices

37- L34	Exercise problems in parity check matrices
38- L35	Equivalent codes
39- L36	Theorem any linear code c is a equivalent to a linear code C having a generator matrix in standard form
40- L37	Examples and exercise problems
41- L38	Exercise problems in equivalent codes
42- L39	Distance of a linear code
43- L40	Examples and exercise problems
44- L41	Examples and exercise problems
45- L42	Distance of a linear code exercise problems
46- L43	Cosets
47- L44	Example and exercise problems
48- L45	Theorem and Exercise problems
49- L46	Exercise problems in cosaets of the linear code
50- L47	Exercise problems in cosets of a linear code
51- P3	**Department Seminar**
52- L48	Exercise problems in cosets of a linear code
53- L49	Minimal likelihood decoding for linear codes
54- L50	Exercise problems in linear codes
55- L51	Reliability of linear codes
56-L52	Syndrome of the word - **Allotting portion for Internal Test-II**
	Internal Test II begins (30.8.2017)
57-L53	Syndrome decoding array and exercise problems
58-L54	Unit-4 Perfect and related codes
59-IT-II	**Internal Test-II**
60- L55	some bounds for codeas, hamming
61- L56	Maximum distance separable - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorem on maximum distance separable
63- L58	Theorems on maximum distance separable
64- L59	Corollary and the theorems
65- L60	Exercise problems in maximum distance separable
66- L61	Theorem Gilbert –varshamov bound
67- L62	Corollary of that theorem
68- L63	Exercise problems in maximum distance separable
69- L64	Perfect codes
70- L65	Hamming codes, extended code
71- L66	Parity check matrix for extended code
72- L67	Weight of the word in the extended code
73- L68	Distance of the extended code
74-P4	**College level meeting/ function**
75- L69	The extended Golay code
76- L70	Unit-5 cyclic linear code
77- L71	Algorithm and division algorithm
78- L72	Exercise problems in division algorithm
79- L73	Polynomial encoding and decoding **Allotting portion for Internal Test-III**
	Internal Test III begins (03.10.2017)

80- L74	Algorithm for decoding linear cyclic decoding
81- L75	Finding cyclic codes
82-IT-III	**Internal Test-III**
83- L76	Another method for linear cyclic codes
84- L77	Exercise problems in linear cyclic codes - **Test Paper distribution and result analysis**
85- L78	Dual cyclic codes
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (19-10-2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	LINEAR ALGEBRA
Course Code	**GMMA51**
Class	III year (2017-2018)
Semester	Odd
Staff Name	J VIJAYA XAVIER PARITHIPAN
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Linear algebra is a branch of mathematics that studies systems of linear equations and the properties of matrices. The concepts of linear algebra are extremely useful in physics, economics and social sciences, natural sciences, and engineering. To understand the axiomatic structure of a modern mathematical subject and learn to construct simple proofs. To solve problems those apply Linear Algebra to Chemistry, Economics and Engineering.

Syllabus

Major Paper 7: Linear Algebra (90Hrs)

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))

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2017
1-L1	Unit-I Introduction
2-L2	Definitions and Examples
3- L3	Scalars, vectors, scalars multiple
4-L4	Notes and Remarks
5-L5	Theorems on vectorspace
6-L6	Subspaces
7-L7	Theorems on supspaces
8-L8	Solved problems and examples
9-L9	Theorems using operations
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Linear transformation
12-L11	Definitions about Homomorphism, Epimorphism and Kernel
13-L12	Fundamental theorem of homomorphism
14-L13	Theorems on vector spaces
15-L14	Span of a set
16-L15	Linear combination, linear span
17-L16	Theorems and examples
18-L17	Unit-II Linear independence
19-L18	Finite dimensional
20-L19	Finite dimensional and its theorems
21-L20	Examples on finite dimensional
22-L21	Linearly independence and dependent
23-L22	Exercises problem - **Allotting portion for Internal Test-I**
	Internal Test I begins (31.07.2017)
24-L23	Note and examples
25-L24	Theorems – any subset of a linearly independent set is linearly independent
26-IT-1	**Internal Test-I**
27-L25	Theorems and examples
28-L26	Basis
29-L27	Theorems on basis
30-L28	Exercise problem - **Test Paper distribution and result analysis**

	Entering Internal Test-I Marks into University portal
31- L29	Theorems and examples
32- L30	Any two bases of finite dimensional vector space V have the same numbers of elements
33- L31	Dimensional
34-P2	**College level meeting/Cell function**
35- L32	Maximal linear independent set
36- L33	Unit-III Rank and nullity
37- L34	Theorems and examples
38- L35	Singular and non-singular
39- L36	Exercise problems on rank
40- L37	Some solved problems on
41- L38	Matrix of a linear transformation
42- L39	Note on matrix
43- L40	Solved problems on Rank of matrix
44- L41	Definition and theorems
45- L42	Exercise problems on matrix
46- L43	Rank of matrix
47- L44	Solved problems
48- L45	Characteristic matrix
49- L46	Theorems and examples on Rank of matrix
50- L47	Theorems and corollary on Rank of matrix
51- P3	**Department Seminar**
52- L48	Solved problems on Characteristic matrix
53- L49	Unit-IV Characteristis equation and cayley Hamilton theorem
54- L50	Matrix polynomial
55- L51	Definitions and examples
56-L52	Cayley Hamilton theorem - **Allotting portion for Internal Test-II**
	Internal Test II begins (30.08.2017)
57-L53	Note and solved problems on Cayley Hamilton theorem
58-L54	Problems using Cayley Hamilton theorem
59-IT-II	**Internal Test-II**
60- L55	Exercise problem on Cayley Hamilton theorem
61- L56	Eigenvalues ,Eigen vectors - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Characteristic roots and properties of Eigen values
63- L58	Results on Eigen values
64- L59	Corollary of Eigen values
65- L60	Solved problems on Eigen values
66- L61	Solved problems on Eigen values
67- L62	Problems to find Eigenvalues
68- L63	Problems to find Eigenvalues
69- L64	Solved problems on Eigenvalue
70- L65	Unit-V Inner product spaces
71- L66	Eucildean space
72- L67	Some notes on Eucildean space
73- L68	Theorems and examples on Eucildean space
74-P4	**College level meeting/ function**

75- L69	Norm, unit vector-definition
76- L70	Solved problems on Norm
77- L71	Theorems using norm
78- L72	Orthogonal
79- L73	Some notes and definitions - **Allotting portion for Internal Test-III**
	Internal Test III begins (03.10.2017)
80- L74	Theorems using orthogonal set
81- L75	Gram –Schmidt Orthogonalisation
82-IT-III	**Internal Test-III**
83- L76	Solved problems on orthogonal set
84- L77	Orthogonal complement - **Test Paper distribution and result analysis**
85- L78	Corollary and solved problems on Orthogonal complement
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course linear Algebra
CO1	Enable the students to learn about the convergence and divergence of the series.
CO2	find the roots for the different types of the equations
CO3	On successful completion of this course the students should have gained knowledge about the convergence of series and solving equations.
CO4	know the fundamentals of vector space
CO5	understand basis and dimension of a vector space.
CO6	determine eigen values and eigen vectors.
CO7	get interest in pure mathematics.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B Sc Mathematics
Course Name	Real Analysis
Course Code	**GMMA52**
Class	III year (2017-2018)
Semester	Odd
Staff Name	W. Rajammal Ranjitha Mary P Gino Metilda
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- The course deals with metric spaces which is a classical extension of the real line and its properties in terms of the distance. The course introduces to the students, metric spaces and its properties. The properties like connectedness, completeness and compactness which are inherent in nature in the real line are extended to the metric spaces. Also properties like continuity and uniform continuity are exploited.

Syllabus

Major Paper 8: Real Analysis (90 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 **R**.

(Chapter 4(full))

Unit 4: Connectedness-Connected subsets of **R-**Connectedness and Continuity-Contraction Mapping Theorem.

(Chapter 5 (full) and Chapter 8 upto theorem 8.2)

Unit 5: Compactness-Comapct metric spaces-Compact subsets of **R-**Heine Borel Theorem-Equivalent Characterizations for compactness-Compactness and Continuity.

(Chapter 6(full))

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2017
1-L1	Unit-I Introduction on Countable sets
2-L2	Theorems and Problems in countable sets
3- L3	Uncountable sets
4-L4	Metric spaces: Definition and examples
5-L5	Examples on a metric spaces
6-L6	Solved problems on a metric spaces
7-L7	Bounded sets in a metric spaces
8-L8	Definition of diameter and its examples
9-L9	Open ball in a metric space
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Examples in open ball
12-L11	Open sets: Definition and examples
13-L12	Theorem on open sets
14-L13	Solved problems on open sets
15-L14	Equivalent metrices
16-L15	Subspaces: Definition and examples
17-L16	Solved problems on subspaces
18-L17	Unit-II Interior of a set: Definition and examples
19-L18	Interior of a set: Theorems
20-L19	Closed set: Definition and examples
21-L20	Closed ball: Definition, examples and theorem
22-L21	Closure: Definition and examples
23-L22	Exercise problems- **Allotting Portion for Internal Test I**
	Internal Test I begins (31.07.2017)
24-L23	Closure: Definition and theorem
25-L24	Limit point: Definition and examples

26-IT-1	**Internal Test-I**
27-L25	Limit point: Theorems
28-L26	Corollary of limit point
29-L27	Solved problems on limit point
30-L28	Exercise problems on limit point :**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Dense set: Definition and examples
32- L30	Dense set: Theorems and solved problems
33- L31	Completeness: Definition and note
34-P2	**College level meeting/Cell function**
35- L32	Completeness: Theorems and examples
36- L33	Theorems and solved problems Completeness
37- L34	Cantor's intersection theorem
38- L35	Unit III- Baire's category theorem- Definition and examples
39- L36	Baire's category theorem and Solved problems
40- L37	Continuity- Definition, ,note, theorem and examples
41- L38	Theorems and solved problems
42- L39	Solved problems on Continuity
43- L40	Homeomorphism: Definition and examples
44- L41	Examples Continuity
45- L42	Isometric definition and examples
46- L43	Uniform continuity- Introduction , definition and note
47- L44	Solved problems on Continuity
48- L45	Discontinuous function on R
49- L46	Discontinuity function- Definition and examples
50- L47	Theorems on Discontinuity function
51- P3	**Department Seminar**
52- L48	Oscillation: Definition and examples
53- L49	Examples and theorem
54- L50	Theorem on Oscillation
55- L51	Unit IV: Connectedness: Introduction, definition and examples
56-L52	Solved problems on Connectedness - **Allotting portion for Internal Test-II**
	Internal Test II begins (30.08.2017)
57-L53	Connectedness and continuity- theorem
58-L54	Solved problems on Connectedness
59-IT-II	**Internal Test-II**
60- L55	Connected subsets of R- theorem
61- L56	Solved problems on Connectedness - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Contraction mapping theorem- Introduction
63- L58	Definition and examples Contraction mapping
64- L59	Contraction mapping theorem
65- L60	Theorem on Contraction mapping
66- L61	Unit V: Compactness- Introduction and Compact metric space-Definition and examples
67- L62	Theorems on Compactness
68- L63	Note and theorems on Compactness

69- L64	Theorems on Compactness
70- L65	Compact subset of R
71- L66	Heine Borel theorem
72- L67	Theorem on Compactness
73- L68	Equivalent characterisation for compactness- definition and examples
74-P4	**College level meeting/ function**
75- L69	Theorems on Compactness
76- L70	Totally bounded definition and examples
77- L71	Subsequence- definition and examples
78- L72	Corollary
79- L73	Sequentially compact- theorems - **Allotting portion for Internal Test-III**
	Internal Test III begins (03.10.2017)
80- L74	Theorems on Sequentially compact
81- L75	Solved problems on Sequentially compact
82-IT-III	**Internal Test-III**
83- L76	Compactness and continuity
84- L77	Note and theorems on Compactness and continuity - **Test Paper distribution and result analysis**
85- L78	Solved problems on Compactness and continuity
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course Real analysis
CO1	Recall elementary properties of real numbers which lead to the Archimedean property, countability and uncountability.
CO2	Predict correct choice of test and apply for test of convergence of series.
CO3	Demonstrate connectedness and correlate the relation between the space and its image under a continuous map with reference to connectedness.
CO4	Describe completeness and its relation with totally boundedness.
CO5	Describe compactness of a metric space and compile all equivalent definitions.
CO6	compare real line and metric space concepts
CO7	get a good foundation for the future studies in Analysis

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Vector Calculus
Course Code	**JSMA3A**
Class	II year (2017-2018)
Semester	Odd
Staff Name	Mrs.Hebzibha
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To provide basic knowledge of vector differentiation and vector integration
- To solve problems related to that
- To explain about line integrals, surface integrals

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2017
1-L1	Intoduction
2-L2	Vector point functions
3- L3	Vector point functions
4-L4	Scalar point functions
5-L5	Scalar point functions
6-L6	Scalar point functions
7-L7	problems
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Derivative of a Vector & Derivative of sum of vectors
10- L9	Derivative of a Vector & Derivative of sum of vectors
11-L10	Derivative of product of a Scalar and Vector point function
12-L11	Derivative of product of a Scalar and Vector point function
13-L12	The vector operator „del" - Gradient
14-L13	The vector operator „del" - Gradient
15-L14	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins (31.07.2017)
16-L15	Divergence
17-IT-1	**Internal Test-I**
18-L16	Divergence
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Curl, solenoidal, irrotational vectors
21- L19	Curl, solenoidal, irrotational vectors
22- P2	**College level meeting/Cell function**
23-L20	Curl, solenoidal, irrotational vectors
24-L21	Problems
25-L22	Problems
26-L23	Laplacian operator.
27-L24	Laplacian operator.
28-L25	Laplacian operator.
29-L26	Integration of point function
30-L27	Integration of point function
31-L28	Integration of point function
32-L29	Line integral
33-L30	Line integral

34- P3	**Department Seminar**
35-L31	Surface integral.
36-L32	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins (30.08.2017)
37- L33	Surface integral.
38- IT-II	**Internal Test-II**
39-L34	Volume integral
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Volume integral
42- L37	Volume integral
43- L38	Gauss divergence theorem (statement only)
44- P4	**College level meeting/ function**
45-L39	Problems.
46-L40	Problems.
47-L41	Problems.
48-L42	Greens theorem and Stoke"s theorem (statements only)
49-L43	Greens theorem and Stoke"s theorem (statements only)
50-L44	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins (03.10.2017)
51 L45	problems
52- L46	problems
53-IT-III	**Internal Test-III**
54-L47	problems
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test (19.10.2017)**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Vector Calculus"
CO1	Acquire basic knowledge of vector differentiation and vector integration.
CO2	Enable the students to solve problems related to that.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Calculus
Course Code	**SMMA11**
Class	I year (2017-2018)
Semester	Odd
Staff Name	Miss.C. Henrietta Johnsy
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To define the curvature and its radius and discuss its properties in both cartesian and polar coordinate systems
- Define curve, graph, involute and evolute and solve related problems
- Study the curve tracing techniques on graphs and discuss some properties graphically
- Discuss the concepts of asymptotes, especially the asymptotes parallel to axes and inclined lines
- To examine various techniques of integration and apply them to definite and improper integrals
- To study about special integral functions, called beta and gamma functions

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – I / Core-1

CALCULUS (75 Hours)

Unit I : Curvature,Radius of Curvature and Centre of curvature in Cartesian and polar
Co-ordinates

Unit II Pedal Equation-Involute and evolute-Asymptotes

Unit III Singular Points(Node,cusp,conjugate points)-Tracing of curves (cartesian only)

Unit IV Double and Triple Integrals - Changing the order of integration - Jacobians and change of variables
Unit V Beta and Gamma functions – Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals, Improper Integrals.
Text Book: Narayanan S and T.K. Manickavasagam Pillai - Calculus Volume I (2004), Volume II (2004), S. Viswanathan Printer Pvt.Ltd.
Books for Reference :

- Kandasamy P and K. Thilagavathi - Mathematics for B.Sc., Volume II – 2004, S. Chand & Co., New Delhi.
- Apostaol T.M. - Calculus, Vol. I (4th edition) John Wiley and Sons, Inc., Newyork 1991.
- Apostaol T.M. - Calculus, Vol. II (2nd edition) John Wiley and Sons, Inc., New York 1969)
- Stewart, J - Single Variable Calculus (4th edition) Brooks / Cole, Cengage Learning 2010.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2017
1-L1	Unit-I Introduction
2-L2	Curvature
3- L3	Curvature
4-L4	Radius of Curvature and Centre of Curvature in Cartesian Coordinates
5-L5	Radius of Curvature and Centre of Curvature in Cartesian Coordinates
6-L6	Radius of Curvature and Centre of Curvature in Polar Coordinates
7-L7	Radius of Curvature and Centre of Curvature in Polar Coordinates
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Unit-II Introduction
10- L9	Pedal Equation
11-L10	Pedal Equation
12-L11	Pedal Equation
13-L12	Evolute
14-L13	Evolute
15-L14	Involute
16-L15	Involute
17- L16	Involute
18- L17	Involute
19- L18	Asymptotes
20- L19	Asymptotes
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins 31-07-2017
22- IT-1	Asymptotes
23- L21	Unit-III Introduction
24- L22	**Internal Test-I**
25- L23	Singular Points (Node)
26- L24	**Test Paper distribution and result analysis**

	Entering Internal Test-I Marks into University portal
27- L25	Singular Points (Node)
28- L26	Singular Points (Cusp)
29- L27	Singular Points (Cusp)
30- P2	**College level meeting/Cell function**
31-L28	Singular Points (Conjugate Points)
32-L29	Singular Points (Conjugate Points)
33-L30	Singular Points (Conjugate Points)
34- L31	Tracing of Curves
35- L32	Tracing of Curves
36- L33	Tracing of Curves
37- L34	Tracing of Curves
38- L35	Unit-IV Introduction
39- L36	Double Integrals
40- L37	Double Integrals
41- L38	Triple Integrals
42-P3	**Department Seminar**
43- L39	Triple Integrals
44- L40	Changing the order of integration
45- L41	Changing the order of integration
46- L42	Changing the order of integration
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins 30-08-2017
48- L44	Jacobians and change of variables
49-IT-II	**Internal Test-II**
50-L45	Jacobians and change of variables
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Unit-V Introduction
53- L48	Beta and Gamma functions
54- L49	Beta and Gamma functions
55- L50	Beta and Gamma functions
56- L51	Beta and Gamma functions
57- L52	Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals
58- L53	Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals
59-P4	**College level meeting/ function**
60- L54	Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals
61- L55	Improper Integrals.
62- L56	Improper Integrals.
63- L57	Improper Integrals.
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2017
65- L59	problems
66- L60	problems
67-IT-III	**Internal Test-III**

68- L61	problems
69- L62	problems
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test 19-10-2017**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course “<Calculus>”
CO1	Enable the students to learn and gain knowledge about curvatures, integrations and its geometrical applications
CO2	On successful completion of course the students should have gained about the evolutes and envelopes, different types of integrations, its geometrical application, single and multiple integration

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Statistics-I
Course Code	**SAST11**
Class	I year (2017-2018)
Semester	Odd
Staff Name	1)Dr. J. Subhashini
	2)Dr. S. Shyamala Malini
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- How to calculate and apply measures of location and measures of dispersion – grouped and ungrouped data cases.
- How to calculate correlation and regression in various business problems.
- How to apply attributes to various types of problems.
- How to apply discrete and continuous probability distributions to various business problems.
- Provide a foundation and motivation for exposure to statistical ideas subsequent to the course.

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – I / Allied –I

SEMESTER – I/III Statistics

Paper – I (90 Hours)

(For Mathematics Students)

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.

Text Book: Gupta .S.C and V.K. Kapoor – Fundamentals of Mathematical Statistics – (2002) Sultan Chand & Sons, New Delhi.

Books for Reference :

- Vittal, V.R. – Mathematical Statistics (2004) Maragatham Publications
- D.C. Sancheti& Kapoor – Statistics
- M.L. Khanna – Statistics
- S. Arumugam & others – Statistics

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2017
1-L1	Unit-I Introduction
2-L2	Moments, Skewness and Kurtosis
3- L3	Moments, Skewness and Kurtosis
4-L4	Moments, Skewness and Kurtosis
5-L5	Curve Fitting
6-L6	Curve Fitting
7-L7	Method of least squares
8-L8	Method of least squares
9-L9	Fitting lines
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Parabolic, Exponential and logarithmic curves.
12-L11	Parabolic, Exponential and logarithmic curves.
13-L12	Parabolic, Exponential and logarithmic curves.
14-L13	Unit-II Introduction
15-L14	Correlation and Regression
16-L15	Correlation and Regression
17-L16	Correlation and Regression
18-L17	Scatter diagram
19-L18	Scatter diagram
20-L19	Scatter diagram
21-L20	Karl Pearson's coefficient of correlation
22-L21	Properties

23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins 31-07-2017
24-L23	Properties
25-L24	Lines of regression
26-IT-1	**Internal Test-I**
27-L25	Regression coefficient and properties
28-L26	Regression coefficient and properties
29-L27	Regression coefficient and properties
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Rank correlation
32- L30	Rank correlation
33- L31	Rank correlation
34-P2	**College level meeting/Cell function**
35- L32	Rank correlation
36- L33	Unit-III Introduction
37- L34	Association of attributes, Consistency of data
38- L35	Association of attributes, Consistency of data
39- L36	Association of attributes, Consistency of data
40- L37	Criteria for independence
41- L38	Criteria for independence
42- L39	Criteria for independence
43- L40	Yule’s coefficient of association
44- L41	Yule’s coefficient of association
45- L42	Yule’s coefficient of association
46- L43	Yule’s coefficient of association
47- L44	Unit-IV Introduction
48- L45	Random variable
49- L46	Random variable
50- L47	Distribution function and its properties
51- P3	**Department Seminar**
52- L48	Distribution function and its properties
53- L49	Mathematical Expectation
54- L50	Mathematical Expectation
55- L51	Mathematical Expectation
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins 30-08-2017
57-L53	Addition theorem of Expectation
58-L54	Multiplication theorem of Expectation
59-IT-II	**Internal Test-II**
60- L55	Moment generating function
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Moment generating function
63- L58	Cumulants
64- L59	Cumulants
65- L60	Characteristic function and its properties
66- L61	Characteristic function and its properties

67- L62	Characteristic function and its properties
68- L63	Unit-V Introduction
69- L64	Discrete and continuous Probability Distributions
70- L65	Discrete and continuous Probability Distributions
71- L66	Discrete and continuous Probability Distributions
72- L67	Binomial and Poisson Distribution and their moments
73- L68	Binomial and Poisson Distribution and their moments
74-P4	**College level meeting/ function**
75- L69	Generating function, characteristic function, properties and simple applications.
76- L70	Generating function, characteristic function, properties and simple applications.
77- L71	Generating function, characteristic function, properties and simple applications.
78- L72	Normal Distribution
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2017
80- L74	Normal Distribution
81- L75	Standard normal distribution and their properties
82-IT-III	**Internal Test-III**
83- L76	Simple problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Simple problems
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 19-10-2017**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 6-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course “<Statistics-I>”
CO1	Students learn the concept of measures of dispersion.
CO2	Students learn the concept of measures of central tendencies.
CO3	Gain the knowledge on probability distributions.
CO4	Gain knowledge on Concepts of Random Variables and Distributions
CO5	Acquire knowledge on Basic Concepts of Expectation and continuous & discrete distribution

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Combinatorial Mathematics
Course Code	**SMMA5C**
Class	III year (2017-2018)
Semester	Odd
Staff Name	1)Dr. G. S. Grace Prema
	2)Mrs. S. Vijila Velvet Daisy
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

Combinatorics is a branch of mathematics concerning the study of finite or countable discrete structures. Aspects of combinatorics include counting the structures of a given kind and size (enumerative combinatorics), deciding when certain criteria can be met, and constructing and analyzing objects meeting the criteria. Many combinatorial questions have historically been considered in isolation, giving an adhoc solution to a problem arising in some mathematical context. In the later twentieth century, however, powerful and general theoretical methods were developed, making combinatorics into an independent branch of mathematics in its own right. Combinatorics is used frequently in computer science to obtain formulas and estimates in the analysis of algorithms

Syllabus

Combinatorial Mathematics (60 Hours)

Unit I Selections and Binomial coefficients – Permutations – Ordered Selections – Unordered Selections – Miscellaneous Problems. **13L**

Unit II Pairings Problems - Pairings within a set – Pairings between sets **12L**

Unit III Recurrence – Fibonacci – type relations. Using generating functions – Miscellaneous methods. **12L**

Unit IV The inclusion – Exclusion Principles **11L**

Unit V Block designs – Square Block designs **11L**
Text Book:
• Ian Andersen – A first course in combinatorial Mathematics – Clarendon Press, Oxford.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-06-2017
1-L1	Unit-I Introduction
2-L2	Selections and Binomial coefficients
3- L3	Selections and Binomial coefficients
4-L4	Selections and Binomial coefficients
5-L5	Permutations
6-L6	Permutations
7-L7	Permutations
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Ordered Selections
10- L9	Ordered Selections
11-L10	Unordered Selections
12-L11	Unordered Selections
13-L12	Miscellaneous Problems
14-L13	Miscellaneous Problems
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins 31-07-2017
16-L15	Unit-II Introduction
17-IT-1	**Internal Test-I**
18-L16	Pairings Problems
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Pairings Problems
21- L19	Pairings within a set
22- P2	**College level meeting/Cell function**
23-L20	Pairings within a set
24-L21	Pairings between sets
25-L22	Pairings between sets
26-L23	Unit-III Introduction
27-L24	Recurrence
28-L25	Recurrence
29-L26	Fibonacci
30-L27	Fibonacci
31-L28	Type relations
32-L29	Type relations
33-L30	Using generating functions
34- P3	**Department Seminar**
35-L31	Using generating functions
36-L32	**Allotting portion for Internal Test-II**

	Internal Test II begins 30-08-2017
37- L33	Miscellaneous methods
38- IT-II	**Internal Test-II**
39-L34	Unit-IV Introduction
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	The inclusion
42- L37	The inclusion
43- L38	The inclusion
44- P4	**College level meeting/ function**
45-L39	Exclusion Principles
46-L40	Exclusion Principles
47-L41	Exclusion Principles
48-L42	Unit-V Introduction
49-L43	Block designs
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2017
51 L45	Block designs
52- L46	Square Block designs
53-IT-III	**Internal Test-III**
54-L47	Square Block designs
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test 19-10-2017**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course "<Combinatorial Mathematics>"
CO1	Acquisition of knowledge on the basic concepts of Pairings and arrangements etc.
CO2	Enable the students to understand aspects of assignment problems
CO3	Students will be able to understand the concepts of block designs

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Operations Research-I
Course Code	**SMMA5D**
Class	III year (2017-2018)
Semester	Odd
Staff Name	Dr. J. Subhashini
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To introduce the various techniques of operations research
- To make the students solve real life problems in Business Management
- To understand different types of LPP

Syllabus

Operations Research-I (60 Hours)

Unit I Linear Programming Problem : Mathematical formulation of LPP – Graphical Method- Simplex Method – Artificial variable technique **13L**

Unit II Concept of Duality – Primal and Dual Problems – Duality – Dual Simplex Method. **12L**

Unit III Transportation Problem : North-West Corner Rule – Matrix Minima method – Vogel‟ s Approximation Method – MODI Method – Degeneracy and Unbalanced Transportationproblem. **12L**

Unit IV Assignment Problem : Hungarian Method – Unbalance Assignment Problem **11L**

Unit V Sequencing Problem: n jobs and 2 machines- n jobs and 3 machines- 2 jobs and m machines **12L**

Text Book :

• KantiSwarup, P.K. Gupta and Manmohan – Operations Research – Sultan Chand & Sons – 2006, 12th edition.

Books for Reference :

• Gupta .P.K and D.S. Hira – Operations Research – S. Chand and Company.

• B.J. Ranganath and A.S.Srikantappa -Operations Research, Yesdee Publishing House,Chennai(2017)

• Hillier, F.S. and G.J. Lieberman - Introduction to Operations Research, 9th Ed., Tata McGrawHill, Singapore, 2009.

• Hamdy A. Taha, - Operations Research, An Introduction, 8th Ed., Prentice – Hall India, 2006.

• Hadley .G. - Linear Programming, Narosa Publishing House, New Delhi, 2002.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-06-2017
1-L1	Unit-I Introduction
2-L2	Mathematical formulation of LPP
3- L3	Mathematical formulation of LPP
4-L4	Graphical Method
5-L5	Graphical Method
6-L6	Simplex Method
7-L7	Simplex Method
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Artificial variable technique
10- L9	Artificial variable technique
11-L10	Unit-II Introduction
12-L11	Concept of Duality
13-L12	Concept of Duality
14-L13	Primal and Dual Problems
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins 31-07-2017
16-L15	Primal and Dual Problems
17-IT-1	**Internal Test-I**
18-L16	Duality

19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Duality
21- L19	Dual Simplex Method
22- P2	**College level meeting/Cell function**
23-L20	Dual Simplex Method
24-L21	Unit-III Introduction
25-L22	North-West Corner Rule
26-L23	North-West Corner Rule
27-L24	Matrix Minima method
28-L25	Matrix Minima method
29-L26	Vogel’s Approximation Method
30-L27	Vogel’s Approximation Method
31-L28	MODI Method
32-L29	MODI Method
33-L30	Degeneracy and Unbalanced Transportationproblem
34- P3	**Department Seminar**
35-L31	Degeneracy and Unbalanced Transportationproblem
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins 31-08-2017
37- L33	Degeneracy and Unbalanced Transportationproblem
38- IT-II	**Internal Test-II**
39-L34	Unit-IV Introduction
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Hungarian Method
42- L37	Hungarian Method
43- L38	Hungarian Method
44- P4	**College level meeting/ function**
45-L39	Unbalance Assignment Problem
46-L40	Hungarian Method
47-L41	Hungarian Method
48-L42	Unit-V Introduction
49-L43	n jobs and 2 machines
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2017
51 L45	n jobs and 3 machines
52- L46	n jobs and 3 machines
53-IT-III	**Internal Test-III**
54-L47	2 jobs and m machines
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test 19-10-2017**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**

	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course “<Operations Research-I>”
CO1	Students get introduced to the various techniques of operations research.
CO2	Enable the students to solve real life problems in Business Management.
CO3	Gaining knowledge on different types of Linear programming Problems

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Linear Algebra
Course Code	**SMMA51**
Class	III year (2017-2018)
Semester	Odd
Staff Name	Dr. J. Vijaya Xavier Parthipan
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Linear algebra is a branch of mathematics that studies systems of linear equations and the properties of matrices. The concepts of linear algebra are extremely useful in physics, economics and social sciences, natural sciences, and engineering. To understand the axiomatic structure of a modern mathematical subject and learn to construct simple proofs. To solve problems those apply Linear Algebra to Chemistry, Economics and Engineering.

Syllabus

LINEAR ALGEBRA (75 Hours)

Unit I Vector Spaces : Definition and examples – elementary properties – subspaces – linear transformation – fundamental theorem of homomorphism **16L.**
Unit II Span of a set – linear dependence and independence – basis and dimension – theorems **14L**
Unit III Rank and nullity Theorem – matrix of a linear transformation
Inner product space : Definition and examples – orthogonality – orthogonal complement – Gram Schmidt orthognalisation process**. 15L**
Unit IV Matrices : Elementary transformation – inverse – rank -Cayley Hamilton Theorem-Applications of Cayley Hamilton Theorem **15L**

Unit V Eigen values and Eigen vectors – Properties and problems-Bilinear Forms-Quadratic Forms-Reduction of quadratic form to diagonal form **15L**
Text Book: Arumugam & Issac – Modern Algebra
Books for Reference :

• Shama .J.N and Vashistha .A.R, “Linear Algebra”, Krishna Prakash Nandir, 1981.

• John B. Fraleigh, “A First Course in Abstract Algebra”, 7th edition, Pearson, 2002.

• Strang G., “Introduction to Linear Algebra”, 4th edition, Wellesly Cambridge Press, Wellesly, 2009.

• Artin M., “Abstract Algebra”, 2nd edition, Pearson, 2011

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-06-2017
1-L1	Unit-I Introduction
2-L2	**Vector Spaces :** Definition and examples
3- L3	Elementary properties
4-L4	Elementary properties
5-L5	Subspaces
6-L6	Subspaces
7-L7	Linear transformation
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Linear transformation
10- L9	Linear transformation
11-L10	Fundamental theorem of homomorphism
12-L11	Unit-II Introduction
13-L12	Span of a set
14-L13	Span of a set
15-L14	linear dependence and independence
16-L15	linear dependence and independence
17- L16	linear dependence and independence
18- L17	basis and dimension
19- L18	basis and dimension
20- L19	basis and dimension
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins 31-07-2017
22- L21	Theorems
23- IT-1	**Internal Test-I**
24- L22	Theorems
25- L23	Theorems
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal

27- L25	Unit-III Introduction
28- L26	Rank and nullity Theorem
29- L27	Rank and nullity Theorem
30- P2	**College level meeting/Cell function**
31-L28	Rank and nullity Theorem
32-L29	matrix of a linear transformation
33-L30	matrix of a linear transformation
34- L31	matrix of a linear transformation
35- L32	**Inner product space :** Definition and examples
36- L33	Definition and examples
37- L34	Orthogonality
38- L35	Orthogonality
39- L36	Orthogonal complement
40- L37	Orthogonal complement
41- L38	Gram Schmidt orthognalisation process
42-P3	**Department Seminar**
43- L39	Gram Schmidt orthognalisation process
44- L40	Gram Schmidt orthognalisation process
45- L41	Unit-IV Introduction
46- L42	**Matrices :** Elementary transformation
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins 30-08-2017
48- L44	Elementary transformation
49-IT-II	**Internal Test-II**
50-L45	Elementary transformation
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Inverse
53- L48	Inverse
54- L49	Rank
55- L50	Rank
56- L51	Cayley Hamilton Theorem
57- L52	Cayley Hamilton Theorem
58- L53	Applications of Cayley Hamilton Theorem
59-P4	**College level meeting/ function**
60- L54	Unit-V Introduction
61- L55	Eigen values and Eigen vectors
62- L56	Eigen values and Eigen vectors
63- L57	Properties and problems
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2017
65- L59	Bilinear Forms and Quadratic Forms
66- L60	Bilinear Forms and Quadratic Forms
67-IT-III	**Internal Test-III**
68- L61	Reduction of quadratic form to diagonal form
69- L62	Reduction of quadratic form to diagonal form
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal

71-MT	**Model Test 19-10-2017**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course “<Abstract Algebra-II>”
CO1	Enable the students to facilitate a better understanding of vector space
CO2	Enable the students to solve problems in matrices

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Real Analysis-II
Course Code	**SMMA52**
Class	III year (2017-2018)
Semester	Odd
Staff Name	Mrs. W. RajammalRanjitha Mary
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives:

- To understand the real number of system and metric spaces
- To know the concepts of continuity and Riemann integrals
- To study the concept of connectedness and compactness

Syllabus

REAL ANALYSIS – II (75 Hours)

Unit I Metric spaces – Examples – bounded sets – open ball – open sets – subspaces – Interior of a set**. 13L**

Unit II Closed sets – closure – Limit points – Dense sets – complete metric space – Cantor" s intersection theorem – Baire" s Category Theorem. **16L**

Unit III Continuous functions on metric spaces : Functions – continuous at a point on the real line – Functions – Continuous – uniform continuous in a metric space – Discontinuous function of R. **15L**

Unit IV Connectedness and compactness : Connectedness – connected subset of R – connectedness and continuity – compact metric spaces – compact subset of R – Heine Borel theorem. **16L**

Unit V Riemann Integral : Sets of measure zero – Existence of the Riemann integral – Derivatives – Rolle" s theorem – Fundamental theorem of Calculus – Mean value theorem – Cauchy" s mean value theorem – Taylor" s theorem. **15L**

Text Books: Arumugam &Issac – Modern Analysis
• Malic .S.C – Mathematical Analysis, Wiley Eastern Limited, New Delhi.

Books for Reference :
• Tom .M. Apostal – Mathematical Analysis, II Edition, Narosa Publishing House, New Delhi (Unit I) (1997)
• Goldberg .R – Methods of Real Analysis Oxford and IBH Publishing Co. New Delhi (200)
• Viswanath Naik .K – Real Analysis, Emerald Publishers, Chennai.
• Berberian .S.K – First course in Real Analysis, Springer Verlag, New York.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-06-2017
1-L1	Unit-I Introduction
2-L2	Metric spaces and Examples
3- L3	Metric spaces and Examples
4-L4	Bounded sets
5-L5	Bounded sets
6-L6	Open ball – Open sets
7-L7	Open ball – Open sets
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Subspaces
10- L9	Subspaces
11-L10	Interior of a set
12-L11	Interior of a set
13-L12	Unit-II Introduction
14-L13	Closed sets
15-L14	Closed sets
16-L15	closure – Limit points
17- L16	closure – Limit points
18- L17	closure – Limit points
19- L18	Dense sets – complete metric space
20- L19	Dense sets – complete metric space
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins 31-07-2017
22- L21	Cantor’s intersection theorem
23- IT-1	**Internal Test-I**
24- L22	Cantor’s intersection theorem
25- L23	Cantor’s intersection theorem

26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Baire's Category Theorem
28- L26	Baire's Category Theorem
29- L27	Unit-III Introduction
30- P2	**College level meeting/Cell function**
31-L28	Continuous functions on metric spaces : Functions
32-L29	Continuous functions on metric spaces : Functions
33-L30	continuous at a point on the real line
34- L31	continuous at a point on the real line
35- L32	Functions – Continuous
36- L33	Functions – Continuous
37- L34	Uniform continuous in a metric space
38- L35	Uniform continuous in a metric space
39- L36	Discontinuous function of R
40- L37	Discontinuous function of R
41- L38	Discontinuous function of R
42-P3	**Department Seminar**
43- L39	Unit-IV Introduction
44- L40	Connectedness and compactness: Connectedness
45- L41	Connectedness and compactness: Connectedness
46- L42	Connected subset of R
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins 30-08-2017
48- L44	Connected subset of R
49-IT-II	**Internal Test-II**
50-L45	Connectedness and continuity
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Connectedness and continuity
53- L48	Compact metric spaces
54- L49	Compact subset of R
55- L50	Compact subset of R
56- L51	Heine Borel theorem
57- L52	Heine Borel theorem
58- L53	Unit-V Introduction
59-P4	**College level meeting/ function**
60- L54	Sets of measure zero – Existence of the Riemann integral– Derivatives
61- L55	Sets of measure zero – Existence of the Riemann integral– Derivatives
62- L56	Rolle's theorem
63- L57	Rolle's theorem
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2017
65- L59	Fundamental theorem of Calculus
66- L60	Mean value theorem – Cauchy's mean value theorem
67-IT-III	**Internal Test-III**
68- L61	Taylor's theorem
69- L62	Taylor's theorem

70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test 19-10-2017**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**Cos** of the course "<Real Analysis-II>"
CO1	Students can understand the real number of system and metric spaces
CO2	Students will know the concepts of continuity and Riemann integrals
CO3	Enable the students to understand the concept of connectedness and compactness

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Statics
Course Code	**SMMA53**
Class	III year (2017-2018)
Semester	Odd
Staff Name	Dr. S. Shyamala Malini
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives:

- To provide the basic knowledge of equilibrium of a particle
- To develop a working knowledge to handle practical problems

Syllabus

STATICS (75 Hours)

Unit I : Forces acting at a point – parallelogram Law f forces – Triangle of forces – Lami‟s Theorem – Problems. **16L**

Unit II: Parallel forces and moments – resultant of two parallel forces – resultant of two unlike unequal parallel forces – Varignon‟s Theorem – Problems. **14L**

Unit III : Equlibrium of three forces acting on a regid body – three coplanar forces theorem – problems. **16L**

Unit IV : Friction – Laws of friction – angle of friction – equilibrium of a particle (i) on a rough inclined plane (ii) under a force parallel to the plane (iii) under any force – problems **15L**

Unit V : Equilibrium of strings – equation of the common catenary – tension at any point – Geometrical properties of common catenary – problems. **14L**

Text Book: Venkatraman, M.K. – Statics, Agasthiar Publications, Trichy.

Books for Reference: .

S – Statics, Emerald Publishers.

3. Duraipandian, P, Laxmi Duraipandian and MuthamizhJayapragasam- Mechanics, S.Chand& Company.

1. Narayanan, S-Statics, S.Chand& Company, New Delhi.

2. Viswanatha Naik, K and Kasi, M

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-06-2017
1-L1	Unit-I Introduction
2-L2	Forces acting at a point
3- L3	Forces acting at a point
4-L4	Forces acting at a point
5-L5	Parallelogram Law f forces
6-L6	Parallelogram Law f forces
7-L7	Triangle of forces
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Triangle of forces
10- L9	Lami's Theorem
11-L10	Problems.
12-L11	Problems.
13-L12	Unit-II Introduction
14-L13	Parallel forces and moments
15-L14	Parallel forces and moments
16-L15	Resultant of two parallel forces
17- L16	Resultant of two parallel forces
18- L17	Resultant of two parallel forces
19- L18	Resultant of two unlike unequal parallel forces
20- L19	Resultant of two unlike unequal parallel forces
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins 31-07-2017
22- L21	Varignon‟s Theorem
23- IT-1	**Internal Test-I**
24- L22	Problems
25- L23	Problems
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Unit-III Introduction
28- L26	Equilibrium of three forces acting on a rigid body
29- L27	Equilibrium of three forces acting on a rigid body

30- P2	**College level meeting/Cell function**
31-L28	Equilibrium of three forces acting on a rigid body
32-L29	Three coplanar forces theorem
33-L30	Three coplanar forces theorem
34- L31	Problems
35- L32	Problems
36- L33	Unit-IV Introduction
37- L34	Friction – Laws of friction
38- L35	Friction – Laws of friction
39- L36	Angle of friction
40- L37	Angle of friction
41- L38	Equilibrium of a particle (i) on a rough inclined plane
42-P3	**Department Seminar**
43- L39	Equilibrium of a particle (i) on a rough inclined plane
44- L40	Equilibrium of a particle (ii) under a force parallel to the plane
45- L41	Equilibrium of a particle (ii) under a force parallel to the plane
46- L42	Equilibrium of a particle (iii) under any force
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins 30-08-2017
48- L44	Equilibrium of a particle (iii) under any force
49-IT-II	**Internal Test-II**
50-L45	Problems
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Problems
53- L48	Unit-V Introduction
54- L49	Equilibrium of strings
55- L50	Equilibrium of strings
56- L51	Equilibrium of strings
57- L52	Equation of the common catenary
58- L53	Equation of the common catenary
59-P4	**College level meeting/ function**
60- L54	Tension at any point
61- L55	Tension at any point
62- L56	Tension at any point
63- L57	Geometrical properties of common catenary
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2017
65- L59	Geometrical properties of common catenary
66- L60	Problems
67-IT-III	**Internal Test-III**
68- L61	Problems
69- L62	Problems
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test 19-10-2017**
72-MT	**Model Test**
73-MT	**Model Test**

74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**Cos** of the course “<Statics>”
CO1	Enable the students to realize the nature of forces and resultant forces when more than one force is acting on a particle.
CO2	On successful completion of course the students should realize the concept about the forces, resultant force of more than one force acting on a surface, friction and center of gravity. Also he can differentiate static and dynamic forces.
CO3	Enable the students with the basic knowledge of equilibrium of a particle
CO4	Enable the students to develop a working knowledge to handle practical problems

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Transforms and their Applications
Course Code	**SMMA54**
Class	III year (2017-2018)
Semester	Odd
Staff Name	Miss. C. Henrietta Johnsy
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To know the concept of index numbers
- To study the distribution functions
- To understand the Analysis of variance

Syllabus

TRANSFORMS AND THEIR APPLIATIONS (75 HOURS)

Unit I Fourier transforms-Properties of Fourier transforms **13L**

Unit II Infinite Fourier Cosines and Sine transforms-Properties **12L**

Unit III Finite Fourier transforms **13L**

Unit IV Z tranforms-Properties **12L**

Unit V Inverse Z transforms **10L**

Text Book: A.Singaravelu-Engineering Mathematics (Volume III)-Meenakshi Agency,Chennai

Reference Book: A.Gangatharan-Engineering Mathematics (Volume II)-PHI (2007)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-06-2017
1-L1	Unit-I Introduction
2-L2	Fourier transforms
3- L3	Fourier transforms
4-L4	Fourier transforms
5-L5	Fourier transforms
6-L6	Properties of Fourier transforms
7-L7	Properties of Fourier transforms
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Properties of Fourier transforms
10- L9	Properties of Fourier transforms
11-L10	Properties of Fourier transforms
12-L11	Properties of Fourier transforms
13-L12	Properties of Fourier transforms
14-L13	Properties of Fourier transforms
15-L14	Unit-II Introduction
16-L15	Infinite Fourier Cosines and Sine transforms
17- L16	Infinite Fourier Cosines and Sine transforms
18- L17	Infinite Fourier Cosines and Sine transforms
19- L18	Infinite Fourier Cosines and Sine transforms
20- L19	Infinite Fourier Cosines and Sine transforms
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins 31-07-2017
22- L21	Properties
23- IT-1	**Internal Test-I**
24- L22	Properties
25- L23	Properties
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Properties
28- L26	Properties
29- L27	Properties
30- P2	**College level meeting/Cell function**
31-L28	Unit-III Introduction
32-L29	Finite Fourier transforms
33-L30	Finite Fourier transforms
34- L31	Finite Fourier transforms
35- L32	Finite Fourier transforms
36- L33	Finite Fourier transforms
37- L34	Finite Fourier transforms
38- L35	Finite Fourier transforms
39- L36	Finite Fourier transforms
40- L37	Finite Fourier transforms

41- L38	Finite Fourier transforms
42-P3	**Department Seminar**
43- L39	Finite Fourier transforms
44- L40	Unit-IV Introduction
45- L41	Z tranforms
46- L42	Z tranforms
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins 30-08-2017
48- L44	Z tranforms
49-IT-II	**Internal Test-II**
50-L45	Z tranforms
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Z tranforms
53- L48	Properties
54- L49	Properties
55- L50	Properties
56- L51	Properties
57- L52	Unit-V Introduction
58- L53	Inverse Z transforms
59-P4	**College level meeting/ function**
60- L54	Inverse Z transforms
61- L55	Inverse Z transforms
62- L56	Inverse Z transforms
63- L57	Inverse Z transforms
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2017
65- L59	Inverse Z transforms
66- L60	Inverse Z transforms
67-IT-III	**Internal Test-III**
68- L61	problems
69- L62	problems
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test 19-10-2017**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course “<Transforms and their Applications>”
CO1	Acquire knowledge on Transformations
CO2	Enable the students to solve the problems connected with Transforms.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Graph Theory
Course Code	**JMMA64**
Class	III year (2018-2019)
Semester	Even
Staff Name	Dr. Mrs. G. S. Grace Prema
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the notion of graph theory and its applications
- To learn the techniques of combinatorics in graph theory

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester VI/Core – 12

GRAPH THEORY

Unit I Finite and infinite graphs – degree – Isolated vertex, pendent vertex and null graph – walks, paths and cycles (Definite and examples only) subgraphs – connected and disconnected graph, Eulerian and Hamiltonian

Unit II Trees and fundamental circuits – properties of Trees - distance and centre, binary tree, spanning tree, cut set and cut vertices - properties – connectivity.

Unit III Planar and dual graphs - different representation of planar graphs – Detection of planarity.

Unit IV Graph operations (unions, composition, product) matrix representation – incident, adjacency matrix – rank – cell set matrix – Relations, path matrix

Unit V Chromatic number – chromatic partitioning. Chromatic polynomial – domination – Covering (definition and examples only) - colouring – five colour Theorem - Four Colour problem.

Text Book:

1) Arumugam .S and S. Ramachandran - Invitation to Graph Theory - Scitech Publications India Pvt. Limited Chennai (2004 edition)

Books for Reference :

1. Narasing Deo – Graph Theory with applications to Engineering and Computer Science - Hall of India Pvt. Ltd.
2. Kumaravelu .S – Graph Theory – Edition 1
3. Gowthem - Graph Theory
4. Roberts .F.S - Graph Theory and its Applications to problems of Society - SIAM. Odyssey Press, New Hamphire 1978.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03.12.2018
1-L1	Introduction
2-L2	Finite and infinite graphs Definitions
3- L3	Finite and infinite graphs Examples
4-L4	Degree Definitions and Example
5-L5	Isolated vertex, pendent vertex and null graph Definitions and Example
6-L6	walks, paths and cycles Definitions and Example
7-L7	Subgraphs
8-L8	Subgraphs
9-L9	Subgraphs
10-P1	**Inauguration of Mathematics Association**
11-L10	Problems
12-L11	connected and disconnected graph
13-L12	connected and disconnected graph
14-L13	connected and disconnected graph
15-L14	connected and disconnected graph
16-L15	Eulerian and Hamiltonian
17-L16	Eulerian and Hamiltonian
18-L17	Trees and fundamental circuits
19-L18	Trees and fundamental circuits
20-L19	Trees and fundamental circuits
21-L20	properties of Trees
22-L21	properties of Trees
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(18.01.2019)
24-L23	properties of Trees
25-L24	Distance and centre, binary tree, spanning tree, cut set and cut vertices definitions and example
26-IT-1	**Internal Test-I**
27-L25	Distance and centre, binary tree, spanning tree, cut set and cut vertices

28-L26	Distance and centre, binary tree, spanning tree, cut set and cut vertices
29-L27	Distance and centre, binary tree, spanning tree, cut set and cut vertices
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Properties
32- L30	Properties
33- L31	connectivity
34-P2	**College level meeting/Cell function**
35- L32	connectivity
36- L33	connectivity
37- L34	Planar and dual graphs
38- L35	Planar and dual graphs
39- L36	Planar and dual graphs
40- L37	Planar and dual graphs
41- L38	different representation of planar graphs
42- L39	different representation of planar graphs
43- L40	different representation of planar graphs
44- L41	different representation of planar graphs
45- L42	different representation of planar graphs
46- L43	Detection of planarity
47- L44	Detection of planarity
48- L45	Detection of planarity
49- L46	Detection of planarity
50- L47	Graph operations (unions, composition, product) matrix representation
51- P3	**Department Seminar**
52- L48	Graph operations (unions, composition, product) matrix representation
53- L49	Graph operations (unions, composition, product) matrix representation
54- L50	Graph operations (unions, composition, product) matrix representation
55- L51	Graph operations (unions, composition, product) matrix representation
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(25.02.2019)
57-L53	Exercise Problem Discussion
58-L54	incident, adjacency matrix
59-IT-II	**Internal Test-II**
60- L55	incident, adjacency matrix
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Rank matrix
63- L58	Rank matrix
64- L59	cell set matrix
65- L60	cell set matrix
66- L61	cell set matrix
67- L62	Relations, path matrix
68- L63	Relations, path matrix
69- L64	Relations, path matrix
70- L65	Chromatic number Definitions and Example
71- L66	chromatic partitioning Definitions and Example
72- L67	Chromatic polynomial Definitions and Example

73- L68	domination Definitions and Example
74-P4	**College level meeting/ function**
75- L69	Covering Definitions and Example
76- L70	colouring
77- L71	colouring
78- L72	five colour Theorem
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(22.03.2019)
80- L74	five colour Theorem
81- L75	Four Colour problem
82-IT-III	**Internal Test-III**
83- L76	Four Colour problem
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (08.04.2019)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Graph Theory"
CO1	Learners will know about the notion of graph theory and its applications.
CO2	Acquisition of knowledge on the techniques of combinatorics in graph theory

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B.Sc. Mathematics
Course Name	Fuzzy Mathematics
Course Code	**JMMA6A**
Class	III year (2018-2019)
Semester	Even
Staff Name	Dr. Mrs. J. Subhashini
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce fuzzy concepts to students
- To facilitate the students to study fuzzy operations and fuzzy numbers

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-VI/ Major Elective– III (A)

FUZZY MATHEMATICS

Unit I Crisp Sets **–** Fuzzy Sets **–** Basic Types – Basic Concepts – Characteristics and Significance of the Paradigm shift.

Unit II Additional properties of α-cuts – representations of fuzzy sets – Extension principle for fuzzy sets.

Unit III Fuzzy set operations **–** Fuzzy complements – Fuzzy intersections : t-norms – Fuzzy Unions : t-conorms – Combinations of operations – Aggregation operations.

Unit IV Fuzzy Numbers **–** Linguistic variables – Arithmetic operations on intervals – Arithmetic operations of fuzzy numbers – Lattice of fuzzy numbers – Fuzzy Equations.

Unit V Fuzzy Decision Making – Individual Decision Making – Multi-person decision making – Fuzzy linear Programming.

Text Book: * George J. Klir and Bo Bo Yuan – Fuzzy sets and Fuzzy Logic Theory Applications, Prentice Hall of India, 2002, New Delhi.

Books for Reference :

1. George J. Klir and Tina .A Folger – Fuzzy sets, uncertainty and Informations – Prentice Hall of India, 2003, New Delhi.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2018
1-L1	Introduction
2-L2	Crisp Sets
3- L3	Crisp Sets
4-L4	Fuzzy Sets
5-L5	Fuzzy Sets
6-L6	Fuzzy Sets
7-L7	Basic Types
8-L8	Basic Types
9-L9	Basic Concepts
10-P1	**Inauguration of Mathematics Association**
11-L10	Basic Concepts
12-L11	Characteristics and Significance of the Paradigm shift.
13-L12	Characteristics and Significance of the Paradigm shift.
14-L13	Characteristics and Significance of the Paradigm shift.
15-L14	Additional properties of α-cuts
16-L15	Additional properties of α-cuts
17-L16	Additional properties of α-cuts
18-L17	Additional properties of α-cuts
19-L18	representations of fuzzy sets
20-L19	representations of fuzzy sets
21-L20	representations of fuzzy sets
22-L21	representations of fuzzy sets
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins03-12-2018
24-L23	Extension principle for fuzzy sets
25-L24	Extension principle for fuzzy sets
26-IT-1	**Internal Test-I**
27-L25	Extension principle for fuzzy sets
28-L26	Extension principle for fuzzy sets
29-L27	Fuzzy set operations
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Fuzzy set operations

32- L30	Fuzzy complements
33- L31	Fuzzy complements
34-P2	**College level meeting/Cell function**
35- L32	Fuzzy intersections : t-norms
36- L33	Fuzzy intersections : t-norms
37- L34	Fuzzy intersections : t-norms
38- L35	Fuzzy Unions : t-conorms
39- L36	Fuzzy Unions : t-conorms
40- L37	Fuzzy Unions : t-conorms
41- L38	Combinations of operations
42- L39	Combinations of operations
43- L40	Combinations of operations
44- L41	Aggregation operations
45- L42	Aggregation operations
46- L43	Aggregation operations
47- L44	Fuzzy Numbers
48- L45	Fuzzy Numbers
49- L46	Linguistic variables
50- L47	Linguistic variables
51- P3	**Department Seminar**
52- L48	Arithmetic operations on intervals
53- L49	Arithmetic operations on intervals
54- L50	Arithmetic operations on intervals
55- L51	Arithmetic operations on intervals
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins25-02-2019
57-L53	Arithmetic operations of fuzzy numbers
58-L54	Arithmetic operations of fuzzy numbers
59-IT-II	**Internal Test-II**
60- L55	Arithmetic operations of fuzzy numbers
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Lattice of fuzzy numbers
63- L58	Lattice of fuzzy numbers
64- L59	Lattice of fuzzy numbers
65- L60	Lattice of fuzzy numbers
66- L61	Fuzzy Equations
67- L62	Fuzzy Equations
68- L63	Fuzzy Equations
69- L64	Fuzzy Decision Making
70- L65	Fuzzy Decision Making
71- L66	Fuzzy Decision Making
72- L67	Individual Decision Making
73- L68	Individual Decision Making
74-P4	**College level meeting/ function**
75- L69	Individual Decision Making
76- L70	Multi-person decision making
77- L71	Multi-person decision making

78- L72	Multi-person decision making
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins22-03-2019
80- L74	Fuzzy linear Programming
81- L75	Fuzzy linear Programming
82-IT-III	**Internal Test-III**
83- L76	Fuzzy linear Programming
84- L77	**Test Paper distribution and result analysis**
85- L78	Fuzzy linear Programming
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (08-04-2019)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course "Fuzzy Mathematics"
CO1	Acquire basic knowledge on fuzzy concepts to students.
CO2	Facilitate the students to study fuzzy operations and fuzzy numbers.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Linear Algebra
Course Code	**JMMA61**
Class	III year (2018-2019)
Semester	Even
Staff Name	Mr. J. Vijaya Xavier Parthiban
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To facilitate a better understanding of vector space
- To solve problems in matrices

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-VI/ Core - 9

LINEAR ALGEBRA

Unit I Vector Spaces**:** Definition and examples – elementary properties – subspaces – linear transformation – fundamental theorem of homomorphism.

Unit II Span of a set – linear dependence and independence – basis and dimension - theorems

Unit III Rank and nullity Theorem – matrix of a linear transformation. Inner product space **:** Definition and examples – orthogonality – orthogonal complement – Gram Schmidt orthogonalisation process.

Unit IV Matrices: Elementary transformation – inverse – rank – test for consistency – solving linear equations.

Unit V Cayley Hamilton theorem – Applications of Cayley Hamilton theorem – Eigen values and Eigen vectors – Properties and problems.

Text Book:

2. Arumugam & others – Modern Algebra

Books for Reference:

1. Shama.J.N and Vashistha .A.R, "Linear Algebra", Krishna Prakash Nandir, 1981.
2. John B. Fraleigh, "A First Course in Abstract Algebra", 7th edition, Pearson, 2002.
3. Strang G., "Introduction to Linear Algebra", 4th edition, Wellesly Cambridge Press, Wellesly, 2009.
4. Artin M., "Abstract Algebra", 2nd edition, Pearson, 2011.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03-12-2018
1-L1	Introduction
2-L2	Vector Spaces**:** Definition and examples
3- L3	Vector Spaces**:** Definition and examples
4-L4	Vector Spaces**:** Definition and examples
5-L5	elementary properties
6-L6	elementary properties
7-L7	elementary properties
8-L8	subspaces
9-L9	subspaces
10-P1	**Inauguration of Mathematics Association**
11-L10	subspaces
12-L11	linear transformation
13-L12	linear transformation
14-L13	linear transformation
15-L14	fundamental theorem of homomorphism
16-L15	fundamental theorem of homomorphism
17-L16	fundamental theorem of homomorphism
18-L17	Span of a set
19-L18	Span of a set
20-L19	Span of a set
21-L20	Span of a set
22-L21	linear dependence and independence
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins18-01-2019
24-L23	linear dependence and independence
25-L24	linear dependence and independence
26-IT-1	**Internal Test-I**
27-L25	linear dependence and independence

28-L26	basis and dimension
29-L27	basis and dimension
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	basis and dimension
32- L30	basis and dimension
33- L31	Theorems
34-P2	**College level meeting/Cell function**
35- L32	theorems
36- L33	theorems
37- L34	Rank and nullity Theorem
38- L35	Rank and nullity Theorem
39- L36	Rank and nullity Theorem
40- L37	matrix of a linear transformation
41- L38	matrix of a linear transformation
42- L39	matrix of a linear transformation
43- L40	Inner product space **:** Definition and examples
44- L41	Inner product space **:** Definition and examples
45- L42	Inner product space **:** Definition and examples
46- L43	orthogonality
47- L44	orthogonality
48- L45	orthogonality
49- L46	orthogonal complement
50- L47	orthogonal complement
51- P3	**Department Seminar**
52- L48	orthogonal complement
53- L49	Gram Schmidt orthogonalisation process
54- L50	Gram Schmidt orthogonalisation process
55- L51	Gram Schmidt orthogonalisation process
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins25-02-2019
57-L53	Elementary transformation
58-L54	Elementary transformation
59-IT-II	**Internal Test-II**
60- L55	Elementary transformation
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Elementary transformation
63- L58	inverse
64- L59	inverse
65- L60	inverse
66- L61	rank
67- L62	rank
68- L63	rank
69- L64	test for consistency
70- L65	test for consistency
71- L66	solving linear equations
72- L67	solving linear equations

73- L68	Cayley Hamilton theorem
74-P4	**College level meeting/ function**
75- L69	Applications of Cayley Hamilton theorem
76- L70	Applications of Cayley Hamilton theorem
77- L71	Eigen values and Eigen vectors
78- L72	Eigen values and Eigen vectors
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins22-03-2019
80- L74	Eigen values and Eigen vectors
81- L75	Eigen values and Eigen vectors
82-IT-III	**Internal Test-III**
83- L76	Properties and problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Properties and problems
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (08-04-2019)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course “Linear Algebra”
CO1	Enable the students to facilitate a better understanding of vector space.
CO2	Enable the students to solve problems in matrices.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Complex Analysis
Course Code	**JMMA62**
Class	III year (2018-2019)
Semester	Even
Staff Name	Dr. G. Jeyakumar Mrs. C. Henrietta Johnsy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To understand thefunctions of complex variables
- To learn about elementary transformations concepts in complex variables
- To understand the singularity concepts and residues

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-VI/ Core – 10

COMPLEX ANALYSIS

Unit I (Analytic functions) Functions of a complex variable – Derivatives – Cauchy – Riemann equations – sufficient conditions – Polar form – Analytic functions – Harmonic functions.

Unit II (Integrals) Definite integrals – Contours – Cauchy – Goursat theorem – antiderivatives and independence of path – Cauchy Integral formula – Morera's theorem.

Unit III (Series) Taylor's series – Examples – Laurent's series – Zeros of analytic functions – Residues – Residue theorem – Principal part of functions – Residues at poles.

Unit IV (Evaluation of Integrals) Evaluation of improper real integrals – improper integrals involving sines and cosines – Definite integrals involving sines and coines.

Unit V (Transformations) Conformal mappings – basic properties – Bilinear maps – fixed points - Applications

Text Book :
1) Arumugam .S and T. Issac –"Complex Analysis" – Scitech Publishing House – Chennai.

Books for Reference :
1. Churchill .R.V. and J.W. Brown – "Complex variables and Applications" – IV edition – McGraw Hill International Editions.
2. Ponnuswamy .S – "Foundations of Complex Analysis", Narosa Publication House, New Delhi, II edition 2005.
3. Duraipandian .P and Lakshmi Duraipandian – "Complex Analysis" – Emerald Publications, Chennai (2001)
4. Shakarchi .R, Problems and solutions of Complex Analysis. Springer – Verlag, New York 1999.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03.12.2018
1-L1	Introduction
2-L2	Functions of a complex variable
3- L3	Functions of a complex variable
4-L4	Functions of a complex variable
5-L5	Derivatives
6-L6	Derivatives
7-L7	Cauchy
8-L8	Riemann equations
9-L9	Riemann equations
10-P1	**Inauguration of Mathematics Association**
11-L10	sufficient conditions
12-L11	sufficient conditions
13-L12	Polar form
14-L13	Polar form
15-L14	Analytic functions
16-L15	Analytic functions
17-L16	Harmonic functions
18-L17	Harmonic functions

19-L18	Definite integrals
20-L19	Definite integrals
21-L20	Contours
22-L21	Cauchy
23-L22	Problems Discussions- **Allotting portion for Internal Test-I**
	Internal Test I begins18-01-2019
24-L23	Goursat theorem
25-L24	Goursat theorem
26-IT-1	**Internal Test-I**
27-L25	antiderivatives and independence of path
28-L26	antiderivatives and independence of path
29-L27	Morera’s theorem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Taylor’s series
32- L30	Taylor’s series
33- L31	Examples
34-P2	**College level meeting/Cell function**
35- L32	Laurent’s series
36- L33	Laurent’s series
37- L34	Zeros of analytic functions
38- L35	Zeros of analytic functions
39- L36	Zeros of analytic functions
40- L37	Residues
41- L38	Residues
42- L39	Residue theorem
43- L40	Principal part of functions
44- L41	Principal part of functions
45- L42	Principal part of functions
46- L43	Residues at poles
47- L44	Residues at poles
48- L45	Principal part of functions
49- L46	Evaluation of improper real integrals
50- L47	Evaluation of improper real integrals
51- P3	**Department Seminar**
52- L48	Evaluation of improper real integrals
53- L49	improper integrals involving sines and cosines
54- L50	improper integrals involving sines and cosines
55- L51	improper integrals involving sines and cosines
56-L52	Problems Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins25-02-2019
57-L53	Problems Discussions
58-L54	Problems Discussions
59-IT-II	**Internal Test-II**
60- L55	Definite integrals involving sines and coines
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Definite integrals involving sines and coines

63- L58	Definite integrals involving sines and coines
64- L59	Problems Discussions
65- L60	Problems Discussions
66- L61	Conformal mappings
67- L62	Conformal mappings
68- L63	Conformal mappings
69- L64	basic properties
70- L65	basic properties
71- L66	Bilinear maps
72- L67	Bilinear maps
73- L68	Bilinear maps
74-P4	**College level meeting/ function**
75- L69	fixed points
76- L70	fixed points
77- L71	fixed points
78- L72	Applications
79- L73	Problems Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins22-03-2019
80- L74	Applications
81- L75	Applications
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (08.04.2019)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Complex Analysis"
CO1	Enable the students to understand the functions of complex variables
CO2	Students will obtain knowledge about elementary transformations, concepts in complex variables.
CO3	Enable the students to understand the singularity concepts and residues.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Number Theory
Course Code	**JMMA63**
Class	III year (2018-2019)
Semester	Even
Staff Name	Mrs.W. Ranjitha Mary Mrs. S. Shyamala Malini
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To highlight the beauties in the world of numbers
- Toprepare the students for coding through congruences

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-VI/ Core -11

NUMBER THEORY

Unit I Peano" s Axioms – Mathematical Induction – The Binomial Theorem – Early Number Theory.

Unit II Division Algorithm – GCD – Euclidean Algorithm – The Diaphantine Equation
ax + by = c.

Unit III The fundamenta Theorem of Arithmetic – The Sieve of Eratosthenes – The Goldbach conjecture.

Unit IV Basis properties of congruences – Linear congruence and the Chinese Remainder Theorem.

Unit V Fermat's Theorem – Wilson's Theorem – The Fermat – Kraitchik Factorization Method.

Text Book:
1) David .M. Burton - Elementary Number Theory (Sixth Edition) Tata McGraw Hill Education Pvt. Ltd.

Books for Reference :
1. Ivan Niven and H, Zuckerman - An Introduction to Theory of Numbers.
2. Kumaravelu .S, and Susheela Kumaravelu - Elements Theory - Nagercoil, 2002.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03.12.2018
1-L1	Introduction
2-L2	Peano"s Axioms
3- L3	Peano"s Axioms
4-L4	Mathematical Induction
5-L5	Mathematical Induction
6-L6	Mathematical Induction Problems
7-L7	Mathematical Induction Problems
8-L8	The Binomial Theorem
9-L9	The Binomial Theorem Problems
10-P1	**Inauguration of Mathematics Association**
11-L10	Early Number Theory
12-L11	Early Number Theory
13-L12	Early Number Theory
14-L13	Early Number Theory
15-L14	Division Algorithm
16-L15	Division Algorithm
17-L16	GCD
18-L17	GCD
19-L18	GCD
20-L19	GCD Problems
21-L20	GCD Problems
22-L21	GCD Problems
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins18-01-2019
24-L23	Euclidean Algorithm
25-L24	Euclidean Algorithm
26-IT-1	**Internal Test-I**
27-L25	The Diaphantine Equation ax + by = c.
28-L26	The Diaphantine Equation ax + by = c.
29-L27	The Diaphantine Equation ax + by = c.
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal

31- L29	The fundamenta Theorem of Arithmetic
32- L30	The fundamenta Theorem of Arithmetic
33- L31	The Sieve of Eratosthenes
34-P2	**College level meeting/Cell function**
35- L32	The Sieve of Eratosthenes
36- L33	The Sieve of Eratosthenes
37- L34	The Sieve of Eratosthenes
38- L35	The Sieve of Eratosthenes
39- L36	The Goldbach conjecture
40- L37	The Goldbach conjecture
41- L38	The Goldbach conjecture
42- L39	The Goldbach conjecture
43- L40	The Goldbach conjecture
44- L41	Basis properties of congruences
45- L42	Basis properties of congruences
46- L43	Basis properties of congruences
47- L44	Basis properties of congruences
48- L45	Linear congruence
49- L46	Linear congruence
50- L47	Linear congruence
51- P3	**Department Seminar**
52- L48	Linear congruence problems
53- L49	Linear congruence Problems
54- L50	Chinese Remainder Theorem
55- L51	Chinese Remainder Theorem
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins25-02-2019
57-L53	Fermat’s Theorem
58-L54	Fermat’s Theorem
59-IT-II	**Internal Test-II**
60- L55	Fermat’s Theorem Problems and Examples
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Fermat’s Theorem Problems and Examples
63- L58	Fermat’s Theorem Problems and Examples
64- L59	Wilson’s Theorem
65- L60	Wilson’s Theorem
66- L61	Wilson’s Theorem Problems and Examples
67- L62	Wilson’s Theorem Problems and Examples
68- L63	Wilson’s Theorem Problems and Examples
69- L64	The Fermat – Kraitchik Factorization Method
70- L65	The Fermat – Kraitchik Factorization Method
71- L66	The Fermat – Kraitchik Factorization Method
72- L67	The Fermat – Kraitchik Factorization Method Problems and Examples
73- L68	The Fermat – Kraitchik Factorization Method Problems and Examples
74-P4	**College level meeting/ function**
75- L69	Revision
76- L70	Revision

77- L71	Revision
78- L72	Class Test
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins22-03-2019
80- L74	Class Test
81- L75	Class Test
82-IT-III	**Internal Test-III**
83- L76	Exercise Problem discussions
84- L77	**Test Paper distribution and result analysis**
85- L78	Exercise Problem discussions
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (08.04.2019)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Number Theory"
CO1	Enable the students to highlight the beauties in the world of numbers.
CO2	Students get prepared for coding through congruence.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	For Science Students
Course Name	Vector Calculus & Fourier Series
Course Code	**SAMA21**
Class	I year (2018-2019)
Semester	Even
Staff Name	Mrs.S.Shyamala Malini
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

Vector Calculus & Fourier Series (90 Hours)

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.
Text Books:

- Dr. S. Arumugam & others – Vector Calculus

- T.K. Manicavachagom Pillai – Calculus (Vol II)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03-12-2018
1-L1	Unit-I Introduction
2-L2	Vector differentiation
3- L3	Vector differentiation
4-L4	Vector differentiation
5-L5	Gradient

6-L6	Gradient
7-L7	Gradient
8-L8	Gradient
9-L9	Divergence and curl
10-P1	**Inauguration of Mathematics Association**
11-L10	Divergence and curl
12-L11	Divergence and curl
13-L12	Divergence and curl
14-L13	Unit-II Introduction
15-L14	Evaluation of double integrals
16-L15	Evaluation of double integrals
17-L16	Evaluation of double integrals
18-L17	Evaluation of double integrals
19-L18	Evaluation of triple integrals
20-L19	Evaluation of triple integrals
21-L20	Evaluation of triple integrals
22-L21	Evaluation of triple integrals
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins18-01-2019
24-L23	Unit-III Introduction
25-L24	Vector integration
26-IT-1	**Internal Test-I**
27-L25	Vector integration
28-L26	Vector integration
29-L27	Vector integration
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Lineintegrals
32- L30	Line integrals
33- L31	Line integrals
34-P2	**College level meeting/Cell function**
35- L32	surface integrals
36- L33	surface integrals
37- L34	surface integrals
38- L35	volume integrals
39- L36	volume integrals
40- L37	volume integrals
41- L38	Unit-IV Introduction
42- L39	Green's theorem
43- L40	Stokes theorem
44- L41	Divergence theorem
45- L42	simple problems
46- L43	simple problems
47- L44	simple problems
48- L45	simple problems
49- L46	simple problems
50- L47	simple problems
51- P3	**Department Seminar**

52- L48	simple problems
53- L49	simple problems
54- L50	simple problems
55- L51	Unit-V Introduction
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins25-02-2019
57-L53	Fourier series
58-L54	Fourier series
59-IT-II	**Internal Test-II**
60- L55	Fourier series
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Fourier series
63- L58	Fourier series
64- L59	Fourier series
65- L60	Even functions
66- L61	Even functions
67- L62	Even functions
68- L63	Even functions
69- L64	Even functions
70- L65	Oddfunctions
71- L66	Odd functions
72- L67	Odd functions
73- L68	Odd functions
74-P4	**College level meeting/ function**
75- L69	Odd functions
76- L70	problems
77- L71	problems
78- L72	problems
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins22-03-2019
80- L74	problems
81- L75	problems
82-IT-III	**Internal Test-III**
83- L76	problems
84- L77	**Test Paper distribution and result analysis**
85- L78	problems
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test08-04-2019**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course “<Vector Calculus & Fourier Series>”
CO1	Acquiring knowledge on vector differentiation and vector integration
CO2	Gaining knowledge on evaluation of double & triple integrals.
CO3	Know about Green’s, Stokes and Divergence theorem.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Statistics-II
Course Code	**SAST21**
Class	I year (2018-2019)
Semester	Even
Staff Name	Mrs. W. RajammalRanjitha Mary
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To know the concept of index numbers
- To study the distribution functions
- To understand the Analysis of variance

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Allied –II

SEMESTER – II / IV
Statistics (For Mathematics Students)
Paper – II (90 Hours)

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.

Text Book:

• Gupta .S.C & V.K. Kapoor – Fundamentals of Mathematical Statistics – (2002) Sultan Chand & Sons, New Delhi.

Books for Reference :

• Vittal .P.R – Mathematical Statistic (2004) – Maragatham Publications
• DC Sancheti& Kapoor – Statistics
• M.L. Khanna – Statistics
• S. Arumugam & others – Statistics

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2018
1-L1	Unit-I Introduction
2-L2	Characteristics of index numbers
3- L3	Laspeyer's index numbers
4-L4	Paasche's index numbers
5-L5	Bowley's index numbers
6-L6	Marshall's index numbers
7-L7	Marshall's index numbers
8-L8	Edgeworth's index numbers
9-L9	Tests-Unit test
10-P1	**Inauguration of Mathematics Association**
11-L10	Commodity reversal test
12-L11	Time reversal test, Circular test
13-L12	Unit-II Introduction
14-L13	Testing of hypothesis
15-L14	Testing of hypothesis
16-L15	Null hypothesis
17-L16	Null hypothesis
18-L17	Alternate hypothesis
19-L18	Type I errors
20-L19	Type II errors
21-L20	Critical region

22-L21	Level of significance
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins18-01-2019
24-L23	Test of significance for large samples
25-L24	Test of significance for large samples
26-IT-1	**Internal Test-I**
27-L25	Testing a single proportion
28-L26	Testing a single proportion
29-L27	Difference of proportions
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Difference of proportions
32- L30	Testing a single mean
33- L31	Testing a single mean
34-P2	**College level meeting/Cell function**
35- L32	Difference of means
36- L33	Difference of means
37- L34	Unit-III Introduction
38- L35	Tests based on t-distribution
39- L36	Tests based on t-distribution
40- L37	single mean
41- L38	Difference of means
42- L39	Tests based on F-distribution
43- L40	Tests based on F-distribution
44- L41	Variance Ratio test
45- L42	Variance Ratio test
46- L43	Tests based on Chi-square Distribution
47- L44	Tests based on Chi-square Distribution
48- L45	Independence – Goodness of fit
49- L46	Unit-IV Introduction
50- L47	Analysis of varience
51- P3	**Department Seminar**
52- L48	Analysis of varience
53- L49	one way and two way classified data
54- L50	one way and two way classified data
55- L51	Basis of experimental design
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins25-02-2019
57-L53	Randomized Block Design
58-L54	Randomized Block Design
59-IT-II	**Internal Test-II**
60- L55	Latin square
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Latin square
63- L58	simple problems.
64- L59	simple problems.
65- L60	Unit-V Introduction

66- L61	Statistical Quality control
67- L62	Statistical Quality control
68- L63	Statistical Quality control
69- L64	Definition – Advantages, Process control
70- L65	Definition – Advantages, Process control
71- L66	Definition – Advantages, Process control
72- L67	Definition – Advantages, Process control
73- L68	Control chart
74-P4	**College level meeting/ function**
75- L69	Mean chart
76- L70	Range chart
77- L71	P-chart
78- L72	Product Control
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins22-03-2019
80- L74	Product Control
81- L75	Sampling Inspection Plans
82-IT-III	**Internal Test-III**
83- L76	Sampling Inspection Plans
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test08-04-2019**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course “<Statistics-II>”
CO1	Students acquire the knowledge on Basic concepts of Sampling and testing of Hypothesis
CO2	Learners knowledge of Testing of Hypothesis for real life problems and for small samples.
CO3	Gain knowledge about various types of Estimators
CO4	Learners learn the Concepts of Correlation and rank correlation coefficient
CO5	Gain Practical Knowledge of Correlation and Rank Correlation Coefficient, t-distribution and F-distribution
CO6	Gain knowledge on statistical quality control

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B Sc Mathematics
Course Name	Analytic Geometry of three dimensions
Course Code	**SMMA21**
Class	I year (2018-2019)
Semester	Even
Staff Name	1)Dr. A. Alwyn Asir
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To describe the objects in three dimensions using coordinate system
- To gain some knowledge about planes in a space
- To know about lines and its properties
- Understanding the structure of spheres and intersections of known objects
- To express cones and cylinder using mathematical equations

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Core-3

ANALYTICAL GEOMETRY OF THREE DIMENSIONS:(75 Hours)

Unit I Analytical Geometry of 3D Co-ordinate system, direction cosines, direction ratios

Unit II Equation of plane in different forms - angle between planes-Length of perpendicular-angle bisection.

Unit III - Equation of a line in different forms - image of a point – image of a line-The plane and the straight line-angle between plane and line-Coplanar lines-Shortest distance between two lines

Unit IV Sphere – Tangent plane – circle of intersections – Tangency of Spheres – coaxial system of spheres - Radical Planes – Orthogonal Spheres.

Unit V Equation of a cone-cone with vertex at the orgin –Tangent plane and normal- Quadratic cone with the vertex at orgin – Right circular cone – Cylinder – Right circular cylinder-enveloping cylinder

Text Book: T.K.Manicavachagom Pillay and T.Natarajan-A text book of Analytical Geometry -Part-II Three Dimensions- S.Viswanathan(Printers&Publishers)Pvt Ltd(2012)

Books for Reference :

• Duraipandian .P. Laxmi Duraipandian and D.Muhilan - Analytical Geometry of Three Dimension - Emerald Publishers.

• Kandasamy .P. and K. Thilagavathi – Mathematics for B.Sc., Vol. IV – 2004 S.Chand and Co. New Delhi.

• Loney .S.L. - The Elements of Coordinate Geometry - Mcmillan and Company London.

• B. Stephen John - Analytical Geometry of 3D and vector differentiation : IDEAL publication.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2018
1-L1	Unit-I Introduction
2-L2	Analytical Geometry of 3D Co-ordinate system
3- L3	Analytical Geometry of 3D Co-ordinate system
4-L4	Analytical Geometry of 3D Co-ordinate system
5-L5	direction cosines
6-L6	direction cosines
7-L7	direction cosines
8- P1	**Inauguration of Mathematics Association**
9- L8	direction ratios
10- L9	direction ratios
11-L10	direction ratios
12-L11	Unit-II Introduction
13-L12	Equation of plane in different forms
14-L13	Equation of plane in different forms
15-L14	Equation of plane in different forms
16-L15	Angle between planes
17- L16	Angle between planes
18- L17	Angle between planes
19- L18	Length of perpendicular
20- L19	Length of perpendicular

21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins18-01-2019
22- L21	Angle bisection
23- IT-1	**Internal Test-I**
24- L22	Angle bisection
25- L23	Unit-III Introduction
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Equation of a line in different forms
28- L26	Equation of a line in different forms
29- L27	Image of a point
30- P2	**College level meeting/Cell function**
31-L28	Image of a line
32-L29	The plane and the straight line
33-L30	The plane and the straight line
34- L31	Angle between plane and line
35- L32	Angle between plane and line
36- L33	Angle between plane and line
37- L34	Coplanar lines
38- L35	Coplanar lines
39- L36	Coplanar lines
40- L37	Shortest distance between two lines
41- L38	Shortest distance between two lines
42-P3	**Department Seminar**
43- L39	Shortest distance between two lines
44- L40	Unit-IV Introduction
45- L41	Sphere
46- L42	Tangent plane
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins 25-02-2019
48- L44	circle of intersections
49-IT-II	**Internal Test-II**
50-L45	Tangency of Spheres
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Coaxial system of spheres
53- L48	Coaxial system of spheres
54- L49	Radical Planes
55- L50	Radical Planes
56- L51	Orthogonal Spheres
57- L52	Orthogonal Spheres
58- L53	Unit-V Introduction
59-P4	**College level meeting/ function**
60- L54	Equation of a cone
61- L55	Equation of a cone
62- L56	Cone with vertex at the orgin
63- L57	Cone with vertex at the orgin
64- L58	**Allotting portion for Internal Test-III**

	Internal Test III begins22-03-2019
65- L59	Tangent plane and normal-Quadratic cone with the vertex at orgin
66- L60	Right circular cone – Cylinder
67-IT-III	**Internal Test-III**
68- L61	Right circular cylinder-Enveloping cylinder
69- L62	Right circular cylinder-Enveloping cylinder
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test08-04-2019**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course “<Analytic Geometry of three dimensions>”
CO1	Enable the students to learn and visualize the fundamental ideas about co-ordinate geometry.
CO2	On successful completion of the course students should have gained knowledge about the regular geometrical figures and their properties

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Differential Equations
Course Code	**SMMA22**
Class	I year (2018-2019)
Semester	Even
Staff Name	Mr. V. Selvan
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Identify the type of a given differential equations and select and apply the appropriate analytical technique for finding the solution of first order abd selected higher order ODE
- Evaluate first order differential equations including separable, homogeneous, exact and linear.
- Solve linear systems of ordinary differential equations
- Solve differential equations using variation of parameters

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Core - 4

DIFFERENTIAL EQUATIONS (75 Hours)

Unit I First order higher degree equations – solvable for *x*,y,p and Clairaut's form – Simultaneous differential equations of the form f1(D)*x*+ g1(D)y = h1(t), f2(D) *x* + g2(D)y = h2(t)

Unit II (Ordinary differential equation) Second order linear differential equations with constant coefficients – Find the P.I for functions of the form ea*x*f(*x*) and *x*nf(*x*)

Unit III Linear equations of second order with variable coefficients – Homogeneous equations – Equation reducible to homogeneous equation.
Unit IV (Partial differential equations) Formation of equations by elimination of arbitrary constants and functions – Definition of general, particular and complete solutions – solving standard forms f(p,q) = 0, f(x, p, q) = 0, f(y, p, q) = 0, f(z, p, q) = 0, f(x, p) = f(y, q), z = px + qy + f(p,q) – Lagrange's differential equations Pp + Qq = R

Unit V Application of differential equations – Growth and Decay – chemical reaction – Newton's law of cooling – Brochistocrone problem – simple electric circuits.

Text Book: Narayanan .S and T.K. Manickavachagam Pillai – Differential equations and its applications, 2003 – S. Viswanathan Printers.

Books for Reference :
• Kandasamy .P and K. Thilagavathi– Mathematics for B.Sc., Vol. III – 2004 – S.Chand and Co., New Delhi.

• Braun .M. – Differential Equations and their applications (III edition) Springer – Verlag, New York 1983)

• Boyce .W.E and R.C. Diprima – Elementary differential equations and Boundary value Problems (VII editions) – John Wiley and Sons, Inc, New York 2001.

• Sankaranarayan and Manguldoss – Differential Equations.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2018
1-L1	Unit-I Introduction
2-L2	First order higher degree equations
3- L3	First order higher degree equations
4-L4	First order higher degree equations
5-L5	solvable for p, x, y and Clairaut's form
6-L6	solvable for p, x, y and Clairaut's form
7-L7	solvable for p, x, y and Clairaut's form
8- P1	**Inauguration of Mathematics Association**
9- L8	Simultaneous differential equations of the form f1(D)x+ g1(D)y = h1(t), f2(D) x + g2(D)y = h2(t)
10- L9	Simultaneous differential equations of the form f1(D)x+ g1(D)y = h1(t), f2(D) x + g2(D)y = h2(t)
11-L10	Simultaneous differential equations of the form f1(D)x+ g1(D)y = h1(t), f2(D) x + g2(D)y = h2(t)

12-L11	Simultaneous differential equations of the form f1(D)*x*+ g1(D)y = h1(t), f2(D) *x* + g2(D)y = h2(t)
13-L12	Unit-II Introduction
14-L13	Linear differential equations of second order with constant coefficients
15-L14	Linear differential equations of second order with constant coefficients
16-L15	Linear differential equations of second order with constant coefficients
17- L16	Linear differential equations of second order with constant coefficients
18- L17	Linear differential equations of second order with constant coefficients
19- L18	Find the P.I for functions of the form ea*x*f(*x*) and *x*nf(*x*)
20- L19	Find the P.I for functions of the form ea*x*f(*x*) and *x*nf(*x*)
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins18-01-2019
22- L21	Find the P.I for functions of the form ea*x*f(*x*) and *x*nf(*x*)
23- IT-1	Find the P.I for functions of the form ea*x*f(*x*) and *x*nf(*x*)
24- L22	Find the P.I for functions of the form ea*x*f(*x*) and *x*nf(*x*)
25- L23	Find the P.I for functions of the form ea*x*f(*x*) and *x*nf(*x*)
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Unit-III Introduction
28- L26	Linear differential equation of second order with variable coefficients
29- L27	Linear differential equation of second order with variable coefficients
30- P2	**College level meeting/Cell function**
31-L28	Linear differential equation of second order with variable coefficients
32-L29	homogeneous equations
33-L30	homogeneous equations
34- L31	homogeneous equations
35- L32	homogeneous equations
36- L33	equation reducible to homogeneous equations
37- L34	equation reducible to homogeneous equations
38- L35	equation reducible to homogeneous equations
39- L36	Unit-IV Introduction
40- L37	Formation of equations by elimination of arbitrary constants and functions
41- L38	Formation of equations by elimination of arbitrary constants and functions
42-P3	**Department Seminar**
43- L39	Formation of equations by elimination of arbitrary constants and functions
44- L40	Definition of general, particular and complete solutions
45- L41	Definition of general, particular and complete solutions
46- L42	Definition of general, particular and complete solutions
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins25-02-2019
48- L44	Solving standard forms f(p,q) = 0, f(*x*, p, q) = 0, f(y, p, q) = 0, f(z, p, q) = 0, f(*x*, p) = f(y, q), z = p*x* + qy + f(p,q)
49-IT-II	**Internal Test-II**
50-L45	Lagrange's differential equations Pp + Qq= R
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Definition of general, particular and complete solutions
53- L48	Definition of general, particular and complete solutions

54- L49	Application of differential equations
55- L50	Application of differential equations
56- L51	Growth and Decay
57- L52	Growth and Decay
58- L53	Chemical reaction
59-P4	**College level meeting/ function**
60- L54	Newton's law of cooling
61- L55	Newton's law of cooling
62- L56	Brochistocrone problem
63- L57	Simple electric circuits
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins22-03-2019
65- L59	problems
66- L60	problems
67-IT-III	**Internal Test-III**
68- L61	problems
69- L62	problems
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test08-04-2019**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**Cos** of the course "<Differential Equations>"
CO1	Enables the students to learn the method of solving Differential Equations. Objectives: End of this course, the students should gain the knowledge about the method of solving Differential Equations.
CO2	It also exposes Differential Equation as a powerful tool in solving problems in Physical and Social sciences

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Trigonometry, Laplace Transforms & Fourier series
Course Code	**SSMA4A**
Class	II year (2018-2019)
Semester	Even
Staff Name	1)Dr. A. Alwyn Asir
	2) Dr. J. Vijaya Xavier Parthipan
Credits	4
L. Hours /P. Hours	4 / WK
Total 60 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives:

- To understand the concept of Trigonometry
- To know the concept of Laplace transform
- To study the concept of Fourier series

Syllabus

TRIGONOMETRY, LAPLACE TRANSFORMS AND FOURIER SERIES

(60 Hours)

Unit I Trigonometry : Expansions of sin nx, cos nx, tan nx and expansions of sinnx&cosnx**. 10L**
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. **13L**
Unit III Laplace Transforms – Inverse Laplace Transforms**. 13L**

Unit IV Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms. **12L**
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. **12L**

Text Books: Arumugam .S and TangapandiIssac .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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2018
1-L1	Unit-I Introduction
2-L2	Expansions of sin nx, cos nx, tan nx
3- L3	Expansions of sin nx, cos nx, tan nx
4-L4	Expansions of sin nx, cos nx, tan nx
5-L5	Expansions of sin nx, cos nx, tan nx
6-L6	expansions of $\sin^n x$&$\cos^n x$
7-L7	expansions of $\sin^n x$&$\cos^n x$
8- P1	**Inauguration of Mathematics Association**
9- L8	expansions of $\sin^n x$&$\cos^n x$
10- L9	Unit-II Introduction
11-L10	Hyperbolic functions
12-L11	Hyperbolic functions
13-L12	Relations between hyperbolic functions and circular functions
14-L13	Relations between hyperbolic functions and circular functions
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins18-01-2019
16-L15	Inverse hyperbolic functions
17-IT-1	**Internal Test-I**
18-L16	Inverse hyperbolic functions
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Logarithm of complex numbers
21- L19	Logarithm of complex numbers

22- P2	**College level meeting/Cell function**
23-L20	Summation of series by C + iS method
24-L21	Summation of series by C + iS method
25-L22	Unit-III Introduction
26-L23	Laplace Transforms
27-L24	Laplace Transforms
28-L25	Laplace Transforms
29-L26	Inverse Laplace Transforms
30-L27	Inverse Laplace Transforms
31-L28	Inverse Laplace Transforms
32-L29	Unit-IV Introduction
33-L30	Solving linear differential equations with constant coefficients
34- P3	**Department Seminar**
35-L31	Solving linear differential equations with constant coefficients
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins25-02-2019
37- L33	Solving linear differential equations with constant coefficients
38- IT-II	**Internal Test-II**
39-L34	Solvingsimultaneous equations using Laplace Transforms
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Solvingsimultaneous equations using Laplace Transforms
42- L37	Solvingsimultaneous equations using Laplace Transforms
43- L38	Solvingsimultaneous equations using Laplace Transforms
44- P4	**College level meeting/ function**
45-L39	Unit-V Introduction
46-L40	Fourier Series – Definition
47-L41	Fourier Series – Definition
48-L42	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
49-L43	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins22-03-2019
51 L45	Odd and even functions
52- L46	Odd and even functions
53-IT-III	**Internal Test-III**
54-L47	Half range series
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test08-04-2019**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course “<Trigonometry, Laplace Transforms & Fourier series>”
CO1	Enable the students to understand the concept of Trigonometry
CO2	Gaining knowledge on the concept of Laplace transform
CO3	Learners will know about the concept of Fourier series

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Abstract Algebra-I
Course Code	**SSMA41**
Class	II year (2018-2019)
Semester	Even
Staff Name	Mrs. S. Vijila Velvet Daisy
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the concept of Groups ,Ring and Field.
- To study the concept of homomorphism

Syllabus

ABSTRACT ALGEBRA-I (90 Hours)

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. **18L**

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 **16L**

Unit III Normal subgroups : Quotient groups – Group Homomorphis – Canonical
homomorphism – kernel of a homomorphism – Isomorphism – Automorphism – Inner automorphism – Permutation groups – Cayley" s theorem**. 20L**

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**. 18L**

Unit V Homomorphism of rings – Isomorphism – kernel of a homomorphism – Fundamental theorem – Field of quotients of an integral domain – polynomial rings – Division algorithm **18L**

Text Book:

• Arumugam .S and TangapandiIssac .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.

• ManicavasagamPillai .T.K and others – Modern Algebra, S. Viswanathan Publishers, Chennai 1993.

• Herstein .I.N – Topics in Algebra, Vikas Publishing Pvt. Ltd. 1975, New Delhi.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03-12-2018
1-L1	Unit-I Introduction
2-L2	Groups – definition and Examples
3- L3	Groups – definition and Examples
4-L4	Groups – definition and Examples
5-L5	Subgroup – order of an element
6-L6	Subgroup – order of an element
7-L7	Subgroup – order of an element
8-L8	Subgroup – order of an element
9-L9	centre of a group – Normalizer and centralizer
10-P1	**Inauguration of Mathematics Association**
11-L10	centre of a group – Normalizer and centralizer
12-L11	centre of a group – Normalizer and centralizer
13-L12	Product of two subgroups and order of HK
14-L13	Product of two subgroups and order of HK
15-L14	Product of two subgroups and order of HK
16-L15	Intersection and union of subgroups
17-L16	Intersection and union of subgroups
18-L17	Intersection and union of subgroups
19-L18	Unit-II Introduction
20-L19	Cyclic groups
21-L20	Cyclic groups

22-L21	Generators of a cyclic group
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins 18-01-2019
24-L23	Number of generators of a cyclic groups
25-L24	Number of generators of a cyclic groups
26-IT-1	**Internal Test-I**
27-L25	Cosets – Partitioning of a group by Cosets
28-L26	Cosets – Partitioning of a group by Cosets
29-L27	Cosets – Partitioning of a group by Cosets
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Lagrange"s theorem – Euler"s theorem
32- L30	Lagrange"s theorem – Euler"s theorem
33- L31	Fermat"s theorem
34-P2	**College level meeting/Cell function**
35- L32	Unit-III Introduction
36- L33	Quotient groups
37- L34	Quotient groups
38- L35	Group Homomorphis
39- L36	Group Homomorphis
40- L37	Canonical homomorphism
41- L38	Canonical homomorphism
42- L39	Kernel of a homomorphism
43- L40	Kernel of a homomorphism
44- L41	Isomorphism – Automorphism
45- L42	Kernel of a homomorphism
46- L43	Isomorphism – Automorphism
47- L44	Inner automorphism
48- L45	Inner automorphism
49- L46	Permutation groups
50- L47	Permutation groups
51- P3	**Department Seminar**
52- L48	Cayley's theorem
53- L49	Unit-IV Introduction
54- L50	Definition and examples
55- L51	Definition and examples
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins 25-02-2019
57-L53	Types of rings and Elementary properties of a ring
58-L54	Types of rings and Elementary properties of a ring
59-IT-II	**Internal Test-II**
60- L55	Integral domain – Field – Sub rings
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Integral domain – Field – Sub rings
63- L58	Subfields – Ideals – Principal ideal
64- L59	Integral domain – Field – Sub rings
65- L60	Subfields – Ideals – Principal ideal

66- L61	Quotient ring – Maximal and prime ideals
67- L62	Quotient ring – Maximal and prime ideals
68- L63	Quotient ring – Maximal and prime ideals
69- L64	Characteristic of a ring – PID – UFD
70- L65	Characteristic of a ring – PID – UFD
71- L66	Characteristic of a ring – PID – UFD
72- L67	Unit-V Introduction
73- L68	Homomorphism of rings – Isomorphism
74-P4	**College level meeting/ function**
75- L69	Homomorphism of rings – Isomorphism
76- L70	kernel of a homomorphism
77- L71	Fundamental theorem – Field of quotients of an integral domain
78- L72	Fundamental theorem – Field of quotients of an integral domain
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins 22-03-2019
80- L74	Fundamental theorem – Field of quotients of an integral domain
81- L75	Polynomial rings
82-IT-III	**Internal Test-III**
83- L76	Division algorithm
84- L77	**Test Paper distribution and result analysis**
85- L78	Division algorithm
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 08-04-2019**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course “<Abstract Algebra-I>”
CO1	Acquire knowledge on the concept of Groups, Ring and Field.
CO2	Gaining knowledge on the concept of homomorphism

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Combinatorial Mathematics
Course Code	**JMMA5D**
Class	III year (2018-2019)
Semester	Odd
Staff Name	Dr. Mrs. G.S. Grace Prema
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To know the basic concepts of Pairings
- To understand relations
- To study the concepts of designs

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-V/
Major Elective – II (A)

Combinatorial Mathematics

Unit I Selections and Binomial coefficients – Permutations – Ordered Selections – Unordered Selections – Miscellaneous Problems.

Unit II Pairings Problems - Pairings within a set – Pairings between sets – An optional assignment problem.

Unit III Recurrence – Fibonacci – type relations. Using generating functions – Miscellaneous methods.

Unit IV The inclusion – Exclusion Principles – The Principle – Rook Polynomials
Unit V Block designs – Square Block designs

Text Books :
1. Ian Andersen – A first course in combinatorial Mathematics – Clarendon Press, Oxford.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-06-2018
1-L1	Introduction
2-L2	Selections and Binomial coefficients
3- L3	Selections and Binomial coefficients
4-L4	Selections and Binomial coefficients
5-L5	Permutations
6-L6	Permutations
7-L7	Permutations
8-L8	Ordered Selections
9-L9	Ordered Selections
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Ordered Selections
12-L11	Unordered Selections
13-L12	Unordered Selections
14-L13	Unordered Selections
15-L14	Miscellaneous Problems
16-L15	Miscellaneous Problems
17-L16	Miscellaneous Problems
18-L17	Pairings Problems
19-L18	Pairings Problems
20-L19	Pairings Problems
21-L20	Pairings Problems
22-L21	Pairings within a set
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins30-07-2018
24-L23	Pairings within a set
25-L24	Pairings within a set
26-IT-1	**Internal Test-I**
27-L25	Pairings within a set
28-L26	Pairings between sets
29-L27	Pairings between sets
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Pairings between sets
32- L30	Pairings between sets
33- L31	An optional assignment problem.
34-P2	**College level meeting/Cell function**
35- L32	An optional assignment problem
36- L33	An optional assignment problem
37- L34	An optional assignment problem
38- L35	Recurrence
39- L36	Recurrence
40- L37	Recurrence
41- L38	Recurrence

42- L39	Fibonacci
43- L40	Fibonacci
44- L41	Fibonacci
45- L42	type relations
46- L43	type relations
47- L44	type relations
48- L45	Using generating functions
49- L46	Using generating functions
50- L47	Using generating functions
51- P3	**Department Seminar**
52- L48	Miscellaneous methods
53- L49	Miscellaneous methods
54- L50	Miscellaneous methods
55- L51	Miscellaneous methods
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins03-09-2018
57-L53	The inclusion
58-L54	The inclusion
59-IT-II	**Internal Test-II**
60- L55	The inclusion
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	The inclusion
63- L58	Exclusion Principles
64- L59	Exclusion Principles
65- L60	Exclusion Principles
66- L61	Exclusion Principles
67- L62	The Principle
68- L63	The Principle
69- L64	The Principle
70- L65	The Principle
71- L66	Rook Polynomials
72- L67	Rook Polynomials
73- L68	Rook Polynomials
74-P4	**College level meeting/ function**
75- L69	Block designs
76- L70	Block designs
77- L71	Block designs
78- L72	Block designs
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins08-10-2018
80- L74	Square Block designs
81- L75	Square Block designs
82-IT-III	**Internal Test-III**
83- L76	Square Block designs
84- L77	**Test Paper distribution and result analysis**
85- L78	Square Block designs
	Entering Internal Test-III Marks into University portal

86-MT	**Model Test (22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

\

Course Outcomes

Learning Outcomes	**COs** of the course "Combinatorial Mathematics"
CO1	Acquisition of knowledge on the basic concepts of Pairings and arrangements etc.
CO2	Enable the students to understand aspects of assignment problems.
CO3	Students will be able to understand the concepts of block designs.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Real Analysis II
Course Code	**JMMA51**
Class	III year (2018-2019)
Semester	Odd
Staff Name	Mrs.W.Ranjitha Mary
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To understand the real number of system and metric spaces.
- To know the concepts of continuity and Riemann integrals
- To study the concept of connectedness and compactness

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-V/ Core - 7

REAL ANALYSIS – II

Unit I Metric spaces – Examples – bounded sets – open ball – open sets – subspaces – Interior of a set.

Unit II Closed sets – closure – Limit points – Dense sets – complete metric space – Cantor's intersection theorem – Baire's Category Theorem.

Unit III Continuous functions on metric spaces : Functions - continuous at a point on the real line – Functions - Continuous – uniform continuous in a metric space – Discontinuous function or R1.

Unit IV Connectedness and compactness : Connectedness – connected subset of R – connectedness and continuity – compact metric spaces – compact subset of R^1 – Heine Borel theorem.

Unit V Riemann Integral : Sets of measure zero – Existence of the Riemann integral – Derivatives – Rolle's theorem – Fundamental theorem of Calculus – Mean value theorem – Cauchy's mean value theorem – Taylor's theorem.

Text Books:

1)Arumugam & Others – Modern Analysis

2) Malic .S.C – Mathematical Analysis, Wiley Eastern Limited, New Delhi.

Books for Reference :

1. Tom .M. Apostal – Mathematical Analysis, II Edition, Narosa Publishing House, New Delhi (Unit I) (1997)
2. Goldberg .R – Methods of Real Analysis Oxford and IBH Publishing Co. New Delhi (200)
3. Viswanath Naik .K – Real Analysis, Emerald Publishers, Chennai.
4. Malic .S.C and Savitha Arora (1991) - Mathematical Analysis, Wiley Eastern Limited, New Delhi.
5. Berberian .S.K – First course in Real Analysis, Springer Verlag, New York.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-06-2018
1-L1	Introduction
2-L2	Metric spaces
3- L3	Metric spaces
4-L4	Metric spaces
5-L5	Examples
6-L6	Examples
7-L7	bounded sets
8-L8	bounded sets
9-L9	open ball
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	open sets
12-L11	open sets
13-L12	subspaces
14-L13	subspaces
15-L14	Interior of a set
16-L15	Interior of a set
17-L16	Closed sets
18-L17	Closed sets
19-L18	closure
20-L19	closure
21-L20	Limit points
22-L21	Limit points
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins30-07-2018
24-L23	Dense sets
25-L24	Dense sets

26-IT-1	**Internal Test-I**
27-L25	complete metric space
28-L26	complete metric space
29-L27	Cantor's intersection theorem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Baire's Category Theorem
32- L30	Continuous functions on metric spaces
33- L31	Continuous functions on metric spaces
34-P2	**College level meeting/Cell function**
35- L32	continuous at a point on the real line
36- L33	continuous at a point on the real line
37- L34	Functions
38- L35	Continuous
39- L36	uniform continuous in a metric space
40- L37	uniform continuous in a metric space
41- L38	connected subset of R
42- L39	connected subset of R
43- L40	connectedness and continuity
44- L41	connectedness and continuity
45- L42	Discontinuous function or R^1
46- L43	Discontinuous function or R^1
47- L44	Connectedness and compactness
48- L45	Connectedness and compactness
49- L46	connected subset of R
50- L47	connected subset of R
51- P3	**Department Seminar**
52- L48	connectedness and continuity
53- L49	connectedness and continuity
54- L50	connectedness and continuity
55- L51	compact metric spaces
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins03-09-2018
57-L53	compact metric spaces
58-L54	compact metric spaces
59-IT-II	**Internal Test-II**
60- L55	compact subset of R1
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	compact subset of R1
63- L58	Heine Borel theorem
64- L59	Sets of measure zero
65- L60	Sets of measure zero
66- L61	Existence of the Riemann integral
67- L62	Existence of the Riemann integral
68- L63	Derivatives
69- L64	Derivatives
70- L65	Rolle's theorem

71- L66	Rolle’s theorem
72- L67	Fundamental theorem of Calculus
73- L68	Fundamental theorem of Calculus
74-P4	**College level meeting/ function**
75- L69	Mean value theorem
76- L70	Mean value theorem
77- L71	Cauchy’s mean value theorem
78- L72	Cauchy’s mean value theorem
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins08-10-2018
80- L74	Taylor’s theorem
81- L75	Taylor’s theorem
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Real Analysis II”
CO1	Students can understand the real number of system and metric spaces.
CO2	Students will know the concepts of continuity and Riemann integrals.
CO3	Enable the students to understand the concept of connectedness and compactness.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Numerical Methods
Course Code	**JMMA5A**
Class	III year (2018-2019)
Semester	Odd
Staff Name	Mr. J. Vijaya Xavier Parthiban
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the finite differences
- To solve numerical problems by different methods

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-V/ Major ElectiveI (A)

NUMERICAL METHODS

Unit I Solution of Numerical algebraic and Transcendental Equations: bisection method – Newton‟s method. Criterion of order of convergence of Newton’s method. Regula False method – Gauss elimination – Gauss Jacobi – Gauss Seidal method

Unit II Finite Difference: First and higher order differences – Forward and backward differences – Properties of Operator – Differences of a polynomial –Factorial polynomial – Error propagation operator E and E-1. Relation among Δ, E, δ and D

Unit III Interpolation : Newton’s Forward – backward, Gauss forward – backward interpolation formula – Bessel’s formula. Divided differences – Newton’s divided difference formula – Lagrange’s interpolation formulae – Inverse interpolation formula.

Unit IV Numerical Differentiation and Integration: Newton's forward and backward differences for differentiation – Derivatives using Bessel's formula – Trapezoidal rule, simpson's 1/3 rule & 3/8 rule – Weddle's rule.

Unit V Difference Equations: Definition – order and degree of difference equation – Linear difference equation – Finding complementary function – particular Integral – simple applications.

Text Books:

Venkataraman .M.L – Numerical methods in Science and Engineering National Publishing Company V Edition 1998.

Books for Reference:

1. Kandasamy .P.K. Thilagavathy and K. Gunavathy „Numerical Methods" S. Chand & Company Ltd. Edn. 2006.
2. B. Stephen John – Numerical Analysis
3. Venkatraman .M.L - Numerical methods in Science and Engineering National Publishing Company V Edition 1998.
4. Autar Kaw and Egwwn Enc Kalu - Numerical methods with Application Abidet. Autokaw.com 2nd 2011.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-06-2018
1-L1	Introduction
2-L2	Solution of Numerical algebraic and Transcendental Equations
3- L3	Solution of Numerical algebraic and Transcendental Equations
4-L4	bisection method
5-L5	bisection method
6-L6	bisection method
7-L7	Newton's method
8-L8	Newton's method
9-L9	Criterion of order of convergence of Newton's method
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Criterion of order of convergence of Newton's method
12-L11	Regula False method
13-L12	Regula False method
14-L13	Gauss elimination
15-L14	Gauss elimination
16-L15	Gauss Jacobi
17-L16	Gauss Jacobi
18-L17	Gauss Seidal method
19-L18	Gauss Seidal method
20-L19	First and higher order differences
21-L20	First and higher order differences
22-L21	Forward and backward differences
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**

	Internal Test I begins30-07-2018
24-L23	Forward and backward differences
25-L24	Forward and backward differences
26-IT-1	**Internal Test-I**
27-L25	Properties of Operator
28-L26	Properties of Operator
29-L27	Differences of a polynomial
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Differences of a polynomial
32- L30	Factorial polynomial
33- L31	Factorial polynomial
34-P2	**College level meeting/Cell function**
35- L32	Error propagation operator E and E-1. Relation among Δ, E, δ and D
36- L33	Error propagation operator E and E-1. Relation among Δ, E, δ and D
37- L34	Interpolation : Newton's Forward – backward
38- L35	Interpolation : Newton's Forward – backward
39- L36	Interpolation : Newton's Forward – backward
40- L37	Gauss forward – backward interpolation formula
41- L38	Gauss forward – backward interpolation formula
42- L39	Gauss forward – backward interpolation formula
43- L40	Bessel's formula
44- L41	Bessel's formula
45- L42	Divided differences
46- L43	Newton's divided difference formula
47- L44	Newton's divided difference formula
48- L45	Lagrange's interpolation formulae
49- L46	Lagrange's interpolation formulae
50- L47	Inverse interpolation formula
51- P3	**Department Seminar**
52- L48	Inverse interpolation formula
53- L49	Newton's forward and backward differences for differentiation
54- L50	Newton's forward and backward differences for differentiation
55- L51	Derivatives using Bessel's formula
56-L52	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins03-09-2018
57-L53	Derivatives using Bessel's formula
58-L54	Trapezoidal rule, simpson's 1/3 rule & 3/8 rule – Weddle's rule.
59-IT-II	**Internal Test-II**
60- L55	Trapezoidal rule, simpson's 1/3 rule & 3/8 rule – Weddle's rule
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Trapezoidal rule, simpson's 1/3 rule & 3/8 rule – Weddle's rule
63- L58	Difference Equations **:** Definition
64- L59	order and degree of difference equation
65- L60	order and degree of difference equation
66- L61	order and degree of difference equation
67- L62	Linear difference equation

68- L63	Linear difference equation
69- L64	Linear difference equation
70- L65	Finding complementary function
71- L66	Finding complementary function
72- L67	particular Integral
73- L68	particular Integral
74-P4	**College level meeting/ function**
75- L69	particular Integral
76- L70	simple applications
77- L71	simple applications
78- L72	simple applications
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins08-10-2018
80- L74	Problems
81- L75	Problems
82-IT-III	**Internal Test-III**
83- L76	Problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Numerical Methods”
CO1	Gaining knowledge on the finite differences.
CO2	Enable the students to solve numerical problems by different methods

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	LINEAR ALGEBRA
Course Code	**JMMA51**
Class	III year (2018-2019)
Semester	Odd
Staff Name	J VIJAYA XAVIER PARITHIPAN
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Linear algebra is a branch of mathematics that studies systems of linear equations and the properties of matrices. The concepts of linear algebra are extremely useful in physics, economics and social sciences, natural sciences, and engineering. To understand the axiomatic structure of a modern mathematical subject and learn to construct simple proofs. To solve problems those apply Linear Algebra to Chemistry, Economics and Engineering.

Syllabus

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))

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-06-2018
1-L1	Unit-I Introduction
2-L2	Definitions and Examples
3- L3	Scalars, vectors, scalars multiple
4-L4	Notes and Remarks
5-L5	Theorems on vectorspace
6-L6	Subspaces
7-L7	Theorems on supspaces
8-L8	Solved problems and examples
9-L9	Theorems using operations
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Linear transformation
12-L11	Definitions about Homomorphism, Epimorphism and Kernel
13-L12	Fundamental theorem of homomorphism
14-L13	Theorems on vector spaces
15-L14	Span of a set
16-L15	Linear combination, linear span
17-L16	Theorems and examples
18-L17	Unit-II Linear independence
19-L18	Finite dimensional
20-L19	Finite dimensional and its theorems
21-L20	Examples on finite dimensional
22-L21	Linearly independence and dependent
23-L22	Exercises problem - **Allotting portion for Internal Test-I**
	Internal Test I begins30-07-2018
24-L23	Note and examples
25-L24	Theorems – any subset of a linearly independent set is linearly independent
26-IT-1	**Internal Test-I**
27-L25	Theorems and examples
28-L26	Basis
29-L27	Theorems on basis
30-L28	Exercise problem - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Theorems and examples
32- L30	Any two bases of finite dimensional vector space V have the same numbers of elements
33- L31	Dimensional
34-P2	**College level meeting/Cell function**
35- L32	Maximal linear independent set
36- L33	Unit-III Rank and nullity
37- L34	Theorems and examples
38- L35	Singular and non-singular

39- L36	Exercise problems on rank
40- L37	Some solved problems on
41- L38	Matrix of a linear transformation
42- L39	Note on matrix
43- L40	Solved problems on Rank of matrix
44- L41	Definition and theorems
45- L42	Exercise problems on matrix
46- L43	Rank of matrix
47- L44	Solved problems
48- L45	Characteristic matrix
49- L46	Theorems and examples on Rank of matrix
50- L47	Theorems and corollary on Rank of matrix
51- P3	**Department Seminar**
52- L48	Solved problems on Characteristic matrix
53- L49	Unit-IV Characteristis equation and cayley Hamilton theorem
54- L50	Matrix polynomial
55- L51	Definitions and examples
56-L52	Cayley Hamilton theorem - **Allotting portion for Internal Test-II**
	Internal Test II begins03-09-2018
57-L53	Note and solved problems on Cayley Hamilton theorem
58-L54	Problems using Cayley Hamilton theorem
59-IT-II	**Internal Test-II**
60- L55	Exercise problem on Cayley Hamilton theorem
61- L56	Eigenvalues ,Eigen vectors - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Characteristic roots and properties of Eigen values
63- L58	Results on Eigen values
64- L59	Corollary of Eigen values
65- L60	Solved problems on Eigen values
66- L61	Solved problems on Eigen values
67- L62	Problems to find Eigenvalues
68- L63	Problems to find Eigenvalues
69- L64	Solved problems on Eigenvalue
70- L65	Unit-V Inner product spaces
71- L66	Eucildean space
72- L67	Some notes on Eucildean space
73- L68	Theorems and examples on Eucildean space
74-P4	**College level meeting/ function**
75- L69	Norm, unit vector-definition
76- L70	Solved problems on Norm
77- L71	Theorems using norm
78- L72	Orthogonal
79- L73	Some notes and definitions - **Allotting portion for Internal Test-III**
	Internal Test III begins08-10-2018
80- L74	Theorems using orthogonal set
81- L75	Gram –Schmidt Orthogonalisation
82-IT-III	**Internal Test-III**
83- L76	Solved problems on orthogonal set

84- L77	Orthogonal complement **- Test Paper distribution and result analysis**
85- L78	Corollary and solved problems on Orthogonal complement
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course linear Algebra
CO1	Enable the students to learn about the convergence and divergence of the series.
CO2	find the roots for the different types of the equations
CO3	On successful completion of this course the students should have gained knowledge about the convergence of series and solving equations.
CO4	know the fundamentals of vector space
CO5	Understand basis and dimension of a vector space.
CO6	Determine Eigen values and Eigen vectors.
CO7	Get interest in pure mathematics.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Mechanics
Course Code	**JMMA52**
Class	III year (2018-2019)
Semester	Odd
Staff Name	Mrs. S.Shyamala MaliniMiss. C.Henrietta Johnsy
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To provide the basic knowledge of equilibrium of a particle
- To provide a basic knowledge of the behaviour of objects in motion
- To develop a working knowledge to handle practical problems

Syllabus

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Mathematics) / Semester-V/ Core - 8
MECHANICS

Unit I Forces acting at a point : Forces acting at a point – types of forces – Triangle of forces – Polygon of forces – Lami’s theorem – Parallel Forces and moments – Resultant of two like parallel forces, unlike and unequal parallel forces – moment of a force – Varignon’s theorem of moments.

Unit II Equilibrium of Strings and Chains : Equilibrium of strings and chains – Common catenary – Suspension bridge.

Unit III Projectiles : Projectiles : Equation of Path – Maximum height – Time of flight – Range.

Unit IV Simple Harmonic Motion : Simple harmonic motion (SHM) in a straight line – Geometrical representation – Composition of SHM‟s of same period in the same line and along two perpendicular direction – SHM as a curve – Simple pendulum – Simple equivalent pendulum. The seconds pendulum.

Unit V Motion under the action of Central Forces : Velocity and acceleration in Polar co-ordinates – Differential equation of Central Orbit – Pedal equation of Central Orbit.

Text Books :

1) Venkataraman .M.K., - Statics, Agastiar Publications 2002, Trichy.
2) Venkataraman .M.K, -A text book on Dynamics, 2001, Agastiar Publications, Trichy.

Books for Reference :

1. Venkataraman .M.K., - Statics, Agastiar Publications 2002, Trichy.
2. Venkataraman .M.K, - A text book on Dynamics, 2001, Agastiar Publications, Trichy.
3. Duraipandian .P, Laxmi Duraipandian and Muthumizh Jayapragasam, Mechanics, 2003, S.Chand and Company.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-06-2018
1-L1	Introduction
2-L2	Simple harmonic motion (SHM) in a straight line
3- L3	Simple harmonic motion (SHM) in a straight line
4-L4	Simple harmonic motion (SHM) in a straight line
5-L5	types of forces
6-L6	Triangle of forces
7-L7	Triangle of forces
8-L8	Polygon of forces
9-L9	Polygon of forces
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Lami’s theorem
12-L11	Parallel Forces and moments
13-L12	Parallel Forces and moments
14-L13	Resultant of two like parallel forces, unlike and unequal parallel forces
15-L14	Resultant of two like parallel forces, unlike and unequal parallel forces
16-L15	moment of a force
17-L16	Varignon’s theorem of moments
18-L17	Equilibrium of strings and chains
19-L18	Equilibrium of strings and chains
20-L19	Equilibrium of strings and chains
21-L20	Equilibrium of strings and chains
22-L21	Common catenary
23-L22	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins30-07-2018
24-L23	Common catenary
25-L24	Common catenary
26-IT-1	**Internal Test-I**
27-L25	Suspension bridge
28-L26	Suspension bridge
29-L27	Suspension bridge
30-L28	**Test Paper distribution and result analysis**

	Entering Internal Test-I Marks into University portal
31- L29	Projectiles
32- L30	Equation of Path
33- L31	Equation of Path
34-P2	**College level meeting/Cell function**
35- L32	Maximum height
36- L33	Maximum height
37- L34	Maximum height
38- L35	Time of flight
39- L36	Time of flight
40- L37	Range
41- L38	Range
42- L39	Simple harmonic motion (SHM) in a straight line
43- L40	Simple harmonic motion (SHM) in a straight line
44- L41	Simple harmonic motion (SHM) in a straight line
45- L42	Geometrical representation
46- L43	Geometrical representation
47- L44	Composition of SHM‟s of same period in the same line and along two perpendicular direction
48- L45	Composition of SHM‟s of same period in the same line and along two perpendicular direction
49- L46	Composition of SHM‟s of same period in the same line and along two perpendicular direction
50- L47	SHM as a curve
51- P3	**Department Seminar**
52- L48	SHM as a curve
53- L49	Simple pendulum
54- L50	Simple pendulum
55- L51	Simple equivalent pendulum. The seconds pendulum
56-L52	Problem Discussions -**Allotting portion for Internal Test-II**
	Internal Test II begins03-09-2018
57-L53	Simple equivalent pendulum. The seconds pendulum
58-L54	Simple equivalent pendulum. The seconds pendulum
59-IT-II	**Internal Test-II**
60- L55	Motion under the action of Central Forces
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Motion under the action of Central Forces
63- L58	Velocity and acceleration in Polar co-ordinates
64- L59	Velocity and acceleration in Polar co-ordinates
65- L60	Velocity and acceleration in Polar co-ordinates
66- L61	Velocity and acceleration in Polar co-ordinates
67- L62	Differential equation of Central Orbit
68- L63	Differential equation of Central Orbit
69- L64	Differential equation of Central Orbit
70- L65	Differential equation of Central Orbit
71- L66	Pedal equation of Central Orbit
72- L67	Pedal equation of Central Orbit

73- L68	Pedal equation of Central Orbit
74-P4	**College level meeting/ function**
75- L69	Exercise Problems
76- L70	Exercise Problems
77- L71	Exercise Problems
78- L72	Exercise Problems
79- L73	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins08-10-2018
80- L74	Revision
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Problems Discussion
84- L77	**Test Paper distribution and result analysis**
85- L78	Problems Discussion
	Entering Internal Test-III Marks into University portal
86-MT	**Model Test (22-10-2018)**
87-MT	**Model Test**
88-MT	**Model Test**
89-L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Mechanics”
CO1	Enable the students to realize the nature of forces and resultant forces when more than one force is acting on a particle.
CO2	On successful completion of course the students should realize the concept about the forces, resultant force of more than one force acting on a surface, friction and center of gravity. Also he can differentiate static and dynamic forces.
CO3	Enable the students with the basic knowledge of equilibrium of a particle
CO4	Enable the students to develop a working knowledge to handle practical problems
CO5	Acquire basic knowledge on the behaviour of objects in motion.
CO6	Enable the students to develop a working knowledge to handle practical problems.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	For Science Students
Course Name	Algebra & Differential Equations
Course Code	**SAMA11**
Class	I year (2018-2019)
Semester	Odd
Staff Name	Mr.V,Selvan
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

Syllabus

Algebra and Differential Equations (90 Hours)

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 Pp + Qq= R.

Unit V Laplace transformation – Inverse Laplace transform.

Text book:

• Dr. S. Arumugam & others – Allied Mathematics – I

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2018
1-L1	Unit-I Introduction
2-L2	Theory of Equations
3- L3	Theory of Equations
4-L4	Theory of Equations
5-L5	Formation of Equations
6-L6	Formation of Equations
7-L7	Formation of Equations
8-L8	Relation between roots and coefficients
9-L9	Relation between roots and coefficients
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Reciprocal equations.
12-L11	Reciprocal equations.
13-L12	Reciprocal equations.
14-L13	Unit-II Introduction
15-L14	Transformation of Equations
16-L15	Transformation of Equations
17-L16	Transformation of Equations
18-L17	Approximate solutions to equations
19-L18	Approximate solutions to equations
20-L19	Approximate solutions to equations
21-L20	Newton’s method and Horner’s method.
22-L21	Newton’s method and Horner’s method.
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins30-07-2018
24-L23	Newton’s method and Horner’s method.
25-L24	Unit-III Introduction
26-IT-1	**Internal Test-I**
27-L25	Matrices
28-L26	Matrices
29-L27	Matrices
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Matrices
32- L30	Characteristic equation of a matrix
33- L31	Characteristic equation of a matrix
34-P2	**College level meeting/Cell function**
35- L32	Eigen values and Eigen vectors
36- L33	Eigen values and Eigen vectors
37- L34	Eigen values and Eigen vectors
38- L35	Cayley Hamilton theorem
39- L36	simple problems.
40- L37	simple problems.

41- L38	simple problems.
42- L39	Unit-IV Introduction
43- L40	Differential equation of first order but of higher degree
44- L41	Differential equation of first order but of higher degree
45- L42	Differential equation of first order but of higher degree
46- L43	Equations solvable for p, *x*, y
47- L44	Equations solvable for p, *x*, y
48- L45	Equations solvable for p, *x*, y
49- L46	Partial differential equations
50- L47	Partial differential equations
51- P3	**Department Seminar**
52- L48	Partial differential equations
53- L49	formations
54- L50	formations
55- L51	solutions
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins03-09-2018
57-L53	solutions
58-L54	solutions
59-IT-II	**Internal Test-II**
60- L55	Standard form Pp + Qq= R.
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Standard form Pp + Qq= R.
63- L58	Unit-V Introduction
64- L59	Laplace transformation
65- L60	Laplace transformation
66- L61	Laplace transformation
67- L62	Laplace transformation
68- L63	Laplace transformation
69- L64	Inverse Laplace transform.
70- L65	Inverse Laplace transform.
71- L66	Inverse Laplace transform.
72- L67	Inverse Laplace transform.
73- L68	Inverse Laplace transform.
74-P4	**College level meeting/ function**
75- L69	Inverse Laplace transform
76- L70	Inverse Laplace transform
77- L71	Inverse Laplace transform
78- L72	Inverse Laplace transform
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins08-10-2018
80- L74	problems
81- L75	problems
82-IT-III	**Internal Test-III**
83- L76	problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision

	Entering Internal Test-III Marks into University portal
86- L79	**Model Test22-10-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Algebra & Differential Equations>”
CO1	Learners study the concept of Laplace transforms.
CO2	Gain knowledge on Theory of matrices

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Statistics-I
Course Code	**SAST11**
Class	I year (2018-2019)
Semester	Odd
Staff Name	1) Mrs. W. RajammalRanjitha Mary
	2)Dr. J. Subhashini
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- How to calculate and apply measures of location and measures of dispersion – grouped and ungrouped data cases.
- How to calculate correlation and regression in various business problems.
- How to apply attributes to various types of problems.
- How to apply discrete and continuous probability distributions to various business problems.
- Provide a foundation and motivation for exposure to statistical ideas subsequent to the course

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – I / Allied –I

SEMESTER – I/III Statistics

Paper – I (90 Hours)

(For Mathematics Students)

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.

Text Book: Gupta .S.C and V.K. Kapoor – Fundamentals of Mathematical Statistics – (2002) Sultan Chand & Sons, New Delhi.

Books for Reference :

- Vittal, V.R. – Mathematical Statistics (2004) Maragatham Publications
- D.C. Sancheti& Kapoor – Statistics
- M.L. Khanna – Statistics
- S. Arumugam & others – Statistics

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2018
1-L1	Unit-I Introduction
2-L2	Moments, Skewness and Kurtosis
3- L3	Moments, Skewness and Kurtosis
4-L4	Moments, Skewness and Kurtosis
5-L5	Curve Fitting
6-L6	Curve Fitting
7-L7	Method of least squares
8-L8	Method of least squares
9-L9	Fitting lines
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Parabolic, Exponential and logarithmic curves.
12-L11	Parabolic, Exponential and logarithmic curves.
13-L12	Parabolic, Exponential and logarithmic curves.
14-L13	Unit-II Introduction
15-L14	Correlation and Regression
16-L15	Correlation and Regression
17-L16	Correlation and Regression

18-L17	Scatter diagram
19-L18	Scatter diagram
20-L19	Scatter diagram
21-L20	Karl Pearson's coefficient of correlation
22-L21	Properties
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins30-07-2018
24-L23	Properties
25-L24	Lines of regression
26-IT-1	**Internal Test-I**
27-L25	Regression coefficient and properties
28-L26	Regression coefficient and properties
29-L27	Regression coefficient and properties
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Rank correlation
32- L30	Rank correlation
33- L31	Rank correlation
34-P2	**College level meeting/Cell function**
35- L32	Rank correlation
36- L33	Unit-III Introduction
37- L34	Association of attributes, Consistency of data
38- L35	Association of attributes, Consistency of data
39- L36	Association of attributes, Consistency of data
40- L37	Criteria for independence
41- L38	Criteria for independence
42- L39	Criteria for independence
43- L40	Yule's coefficient of association
44- L41	Yule's coefficient of association
45- L42	Yule's coefficient of association
46- L43	Yule's coefficient of association
47- L44	Unit-IV Introduction
48- L45	Random variable
49- L46	Random variable
50- L47	Distribution function and its properties
51- P3	**Department Seminar**
52- L48	Distribution function and its properties
53- L49	Mathematical Expectation
54- L50	Mathematical Expectation
55- L51	Mathematical Expectation
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins03-09-2018
57-L53	Addition theorem of Expectation
58-L54	Multiplication theorem of Expectation
59-IT-II	**Internal Test-II**
60- L55	Moment generating function
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal

62- L57	Moment generating function
63- L58	Cumulants
64- L59	Cumulants
65- L60	Characteristic function and its properties
66- L61	Characteristic function and its properties
67- L62	Characteristic function and its properties
68- L63	Unit-V Introduction
69- L64	Discrete and continuous Probability Distributions
70- L65	Discrete and continuous Probability Distributions
71- L66	Discrete and continuous Probability Distributions
72- L67	Binomial and Poisson Distribution and their moments
73- L68	Binomial and Poisson Distribution and their moments
74-P4	**College level meeting/ function**
75- L69	Generating function, characteristic function, properties and simple applications.
76- L70	Generating function, characteristic function, properties and simple applications.
77- L71	Generating function, characteristic function, properties and simple applications.
78- L72	Normal Distribution
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins08-10-2018
80- L74	Normal Distribution
81- L75	Standard normal distribution and their properties
82-IT-III	**Internal Test-III**
83- L76	Simple problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Simple problems
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test22-10-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Statistics-I>”
CO1	Students learn the concept of measures of dispersion.
CO2	Students learn the concept of measures of central tendencies.
CO3	Gain the knowledge on probability distributions.
CO4	Gain knowledge on Concepts of Random Variables and Distributions
CO5	Acquire knowledge on Basic Concepts of Expectation and continuous & discrete distribution

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Calculus
Course Code	**SMMA11**
Class	I year (2018-2019)
Semester	Odd
Staff Name	1)Dr. T. Jeya Kumar
	2)Mr. V. Selvan
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To define the curvature and its radius and discuss its properties in both cartesian and polar coordinate systems
- Define curve, graph, involute and evolute and solve related problems
- Study the curve tracing techniques on graphs and discuss some properties graphically
- Discuss the concepts of asymptotes, especially the asymptotes parallel to axes and inclined lines
- To examine various techniques of integration and apply them to definite and improper integrals
- To study about special integral functions, called beta and gamma functions

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – I / Core-1

CALCULUS (75 Hours)

Unit I : Curvature,Radius of Curvature and Centre of curvature in Cartesian and polar
Co-ordinates

Unit II Pedal Equation-Involute and evolute-Asymptotes

Unit III Singular Points(Node,cusp,conjugate points)-Tracing of curves (cartesian only)

Unit IV Double and Triple Integrals - Changing the order of integration - Jacobians and change of variables

Unit V Beta and Gamma functions – Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals, Improper Integrals.

Text Book: Narayanan S and T.K. Manickavasagam Pillai - Calculus Volume I (2004), Volume II (2004), S. Viswanathan Printer Pvt.Ltd.

Books for Reference :

- Kandasamy P and K. Thilagavathi - Mathematics for B.Sc., Volume II – 2004, S. Chand & Co., New Delhi.
- Apostaol T.M. - Calculus, Vol. I (4th edition) John Wiley and Sons, Inc., Newyork 1991.
- Apostaol T.M. - Calculus, Vol. II (2nd edition) John Wiley and Sons, Inc., New York 1969)
- Stewart, J - Single Variable Calculus (4th edition) Brooks / Cole, Cengage Learning 2010.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2018
1-L1	Unit-I Introduction
2-L2	Curvature
3- L3	Curvature
4-L4	Radius of Curvature and Centre of Curvature in Cartesian Coordinates
5-L5	Radius of Curvature and Centre of Curvature in Cartesian Coordinates
6-L6	Radius of Curvature and Centre of Curvature in Polar Coordinates
7-L7	Radius of Curvature and Centre of Curvature in Polar Coordinates
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Unit-II Introduction
10- L9	Pedal Equation
11-L10	Pedal Equation
12-L11	Pedal Equation
13-L12	Evolute
14-L13	Evolute
15-L14	Involute
16-L15	Involute
17- L16	Involute
18- L17	Involute
19- L18	Asymptotes

20- L19	Asymptotes
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins30-07-2018
22- IT-1	Asymptotes
23- L21	Unit-III Introduction
24- L22	**Internal Test-I**
25- L23	Singular Points (Node)
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Singular Points (Node)
28- L26	Singular Points (Cusp)
29- L27	Singular Points (Cusp)
30- P2	**College level meeting/Cell function**
31-L28	Singular Points (Conjugate Points)
32-L29	Singular Points (Conjugate Points)
33-L30	Singular Points (Conjugate Points)
34- L31	Tracing of Curves
35- L32	Tracing of Curves
36- L33	Tracing of Curves
37- L34	Tracing of Curves
38- L35	Unit-IV Introduction
39- L36	Double Integrals
40- L37	Double Integrals
41- L38	Triple Integrals
42-P3	**Department Seminar**
43- L39	Triple Integrals
44- L40	Changing the order of integration
45- L41	Changing the order of integration
46- L42	Changing the order of integration
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins03-09-2018
48- L44	Jacobians and change of variables
49-IT-II	**Internal Test-II**
50-L45	Jacobians and change of variables
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Unit-V Introduction
53- L48	Beta and Gamma functions
54- L49	Beta and Gamma functions
55- L50	Beta and Gamma functions
56- L51	Beta and Gamma functions
57- L52	Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals
58- L53	Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals
59-P4	**College level meeting/ function**
60- L54	Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals

61- L55	Improper Integrals.
62- L56	Improper Integrals.
63- L57	Improper Integrals.
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins08-10-2018
65- L59	problems
66- L60	problems
67-IT-III	**Internal Test-III**
68- L61	problems
69- L62	problems
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test22-10-2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Calculus>”
CO1	Enable the students to learn and gain knowledge about curvatures, integrations and its geometrical applications
CO2	On successful completion of course the students should have gained about the evolutes and envelopes, different types of integrations, its geometrical application, single and multiple integration

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Classical Algebra
Course Code	**SMMA12**
Class	I year (2018-2019)
Semester	Odd
Staff Name	Dr. A. Alwyn Asir
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Gain the knowledge of theory of equations.
- Understanding the concept of Powers of the roots of the equations
- To provide the understanding of Newton's method, Horner's method

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – I / Core - 2

CLASSICAL ALGEBRA (75 Hours)

Unit I Theory of Equations – Formation of equations – Relation between roots and coefficients –
symmetric function of the roots.

Unit II Sum of the powers of the roots of an equation – Newton's theorem, Reciprocal Equations.

Unit III Transformation of equations, Descarte's rule of signs – Rolle's theorem

Unit IV Multiple roots, Sturm's Theorem, solving appropriate solution of equations using Newton's and Horner's method.

Unit V Biquadratic equations – solution by Ferrari's method – cubic equations – solutions by Cardon's method.
Text Book: ManickavasagamPillai .T.K and S. Narayanan - Algebra – Viswanathan Publishers and Printers Pvt. Ltd., - 2004.

Books for Reference :

• Kandasamy P and K. Thilagavathi - Mathematics for B.Sc., - 2004, Volume I and Volume IV, S. Chand & Co., New Delhi.

• Arumugam .S, ThangapandiIssac – Classical Algebra, New Gamma Publishing House, Palayamkottai.

• Burnside, W.S. and A.W. Panton - The Theory of Equations, Dublin University Press, 1954.

• MacDuffee, C.C. - Theory of Equations, John Wiley & Sons Inc., 1954.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2018
1-L1	Unit-I Introduction
2-L2	Theory of equations
3- L3	Theory of equations
4-L4	Formation of equations
5-L5	Formation of equations
6-L6	Relation between roots and coefficients of equations
7-L7	Relation between roots and coefficients of equations
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Relation between roots and coefficients of equations
10- L9	symmetric function of the roots
11-L10	symmetric function of the roots
12-L11	symmetric function of the roots
13-L12	Unit-II Introduction
14-L13	Sum of the rthpowers of the roots of an equation
15-L14	Sum of the rthpowers of the roots of an equation
16-L15	Sum of the rthpowers of the roots of an equation
17- L16	Newton's theorem
18- L17	Newton's theorem
19- L18	Newton's theorem
20- L19	Reciprocal equations
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins 30-07-2018
22- L21	Reciprocal equations
23- IT-1	**Internal Test-I**
24- L22	Unit-III Introduction

25- L23	Transformation of Equations
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Transformation of Equations
28- L26	Transformation of Equations
29- L27	Descarte's rule of signs
30- P2	**College level meeting/Cell function**
31-L28	Descarte's rule of signs
32-L29	Descarte's rule of signs
33-L30	Rolle's theorem
34- L31	Rolle's theorem
35- L32	Rolle's theorem
36- L33	Unit-IV Introduction
37- L34	Multiple roots
38- L35	Multiple roots
39- L36	Multiple roots
40- L37	Multiple roots
41- L38	Sturm's Theorem
42-P3	**Department Seminar**
43- L39	Sturm's Theorem
44- L40	Solving appropriate solution of equations using Newton's and Horner's method
45- L41	Solving appropriate solution of equations using Newton's and Horner's method
46- L42	Solving appropriate solution of equations using Newton's and Horner's method
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins 03-09-2018
48- L44	Solving appropriate solution of equations using Newton's and Horner's method
49-IT-II	**Internal Test-II**
50-L45	Unit-V Introduction
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Biquadratic equations
53- L48	Biquadratic equations
54- L49	Biquadratic equations
55- L50	solution by Ferrari's method
56- L51	solution by Ferrari's method
57- L52	solution by Ferrari's method
58- L53	cubic equations
59-P4	**College level meeting/ function**
60- L54	cubic equations
61- L55	Solutions by Cardon's method
62- L56	Solutions by Cardon's method
63- L57	Solutions by Cardon's method
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins 08-10-2018
65- L59	problems
66- L60	problems
67-IT-III	**Internal Test-III**
68- L61	problems

69- L62	problems
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test 22-10-2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-10-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Classical Algebra>”
CO1	Enable the students to learn about the convergence and divergence of the series and to find the roots for the different types of the equations.
CO2	On successful completion of this course the students should have gained knowledge about the convergence of series and solving equations.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Real Analysis-I
Course Code	**SMMA31**
Class	II year (2018-2019)
Semester	Odd
Staff Name	Mrs. S. Vijila Velvet Daisy
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To lay a god foundation of classical analysis
- To study the behaviour of sequences and series

Syllabus

CORE PAPER –V

REAL ANALYSIS – I (90 Hours)

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**. 11L**

Unit II Sequences : Bounded sequences – monotonic sequences – convergent sequences – divergent and oscillating sequences – The algebra of limits. **17L**

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**. 19L**
Unit IV Series : Infinite series – nth term test – Comparison test – Kummer" s test – D" Alemberls ratio test – Raabe" s test - Gauss test – Root test **23L**

Unit V Alternating series – Leibnitz" s test - Tests for convergence of series of arbitrary terms – Multiplication of series- Abel's Throrem-Mertens theorem-Power Series-Radius of convergence **20L**

Text Books:
• Arumugam .S and ThengapandiIssac – "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

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin 18-6-2018
1-L1	Unit-I Introduction
2-L2	The field of axioms, the order axioms
3- L3	The field of axioms, the order axioms
4-L4	The rational numbers, the irrational numbers
5-L5	The rational numbers, the irrational numbers
6-L6	Upper bounds, maximum element, least upper bound (supremum)
7-L7	Upper bounds, maximum element, least upper bound (supremum)
8-L8	The completeness axiom, absolute values
9-L9	The completeness axiom, absolute values
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	The triangle inequality. Cauchy – Schwartz's inequality.
12-L11	The triangle inequality. Cauchy – Schwartz's inequality.
13-L12	The triangle inequality. Cauchy – Schwartz's inequality.
14-L13	Unit-II Introduction
15-L14	Bounded sequences
16-L15	Bounded sequences
17-L16	Monotonic sequences
18-L17	Monotonic sequences
19-L18	Convergent sequences
20-L19	Convergent sequences
21-L20	Convergent sequences

22-L21	Divergent and oscillating sequences
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins30-07-2018
24-L23	Divergent and oscillating sequences
25-L24	The algebra of limits
26-IT-1	**Internal Test-I**
27-L25	The algebra of limits
28-L26	Unit-III Introduction
29-L27	Behaviour of monotonic sequences
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Behaviour of monotonic sequences
32- L30	Cauchy's first limit theorem
33- L31	Cauchy's first limit theorem
34-P2	**College level meeting/Cell function**
35- L32	Cauchy's second limit theorem
36- L33	Cauchy's second limit theorem
37- L34	Cesaro's theorem
38- L35	Cesaro's theorem
39- L36	Subsequences
40- L37	Subsequences
41- L38	Subsequences
42- L39	Cauchy sequence
43- L40	Cauchy sequence
44- L41	Cauchy sequence
45- L42	Unit-IV Introduction
46- L43	Infinite series
47- L44	Infinite series
48- L45	Infinite series
49- L46	nth term test
50- L47	nth term test
51- P3	**Department Seminar**
52- L48	Comparison test
53- L49	Comparison test
54- L50	Kummer's test
55- L51	Kummer's test
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins03-09-2018
57-L53	D'Alemberls ratio test
58-L54	D'Alemberls ratio test
59-IT-II	**Internal Test-II**
60- L55	Raabe's test
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Raabe's test
63- L58	Gauss test
64- L59	Gauss test
65- L60	Root test

66- L61	Root test
67- L62	Unit-V Introduction
68- L63	Alternating series
69- L64	Alternating series
70- L65	Leibnitz’s test
71- L66	Leibnitz’s test
72- L67	Tests for convergence of series of arbitrary terms
73- L68	Tests for convergence of series of arbitrary terms
74-P4	**College level meeting/ function**
75- L69	Multiplication of series
76- L70	Multiplication of series
77- L71	Abel's Throrem
78- L72	Mertens theorem
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins08-10-2018
80- L74	Power Series
81- L75	Radius of convergence
82-IT-III	**Internal Test-III**
83- L76	Radius of convergence
84- L77	**Test Paper distribution and result analysis**
85- L78	Radius of convergence
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test22-10-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Real Analysis-I>”
CO1	Enable the students with a good foundation of classical analysis.
CO2	Learners will obtain the knowledge on behaviour of sequences and series

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Vector Calculus
Course Code	**SSMA3A**
Class	II year (2018-2019)
Semester	Odd
Staff Name	Mr. V. Selvan
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives:

- To provide basic knowledge of vector differentiation and vector integration
- To solve problems related to that

Syllabus

VECTOR CALCULUS (60 Hours)

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 **13L**

Unit II Divergence – Curl, solenoidal, irrotational vectors – Laplacian operator**. 12L**

Unit III Integration of point function – Line integral – Surface integral**, 13L**

Unit IV Volume integral – Gauss divergence theorem (statement only) – Problems. **12L**

Unit V Greens theorem and Stoke" s theorem (statements only) – problems. **10L**

Text Book:

• DuraiPandian.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, (4^{th}Edn.) Pearson Education, Boston 2012.

• Anil Kumar Sharma, - Text book of Vector Calculus, Discovery Publishing House, 1993.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2018
1-L1	Unit-I Introduction
2-L2	Vector point functions
3- L3	Vector point functions
4-L4	Scalar point functions
5-L5	Scalar point functions
6-L6	Derivative of a Vector & Derivative of sum of vectors
7-L7	Derivative of a Vector & Derivative of sum of vectors
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Derivative of a Vector & Derivative of sum of vectors
10- L9	Derivative of product of a Scalar and Vector point function
11-L10	Derivative of product of a Scalar and Vector point function
12-L11	The vector operator ‘del’
13-L12	The vector operator ‘del’
14-L13	Gradient
15-L14	**Allotting portion for Internal Test-I**
	Internal Test I begins30-07-2018
16-L15	Gradient
17-IT-1	**Internal Test-I**
18-L16	Unit-II Introduction
19-L17	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Divergence
21- L19	Divergence
22- P2	**College level meeting/Cell function**
23-L20	Curl, solenoidal, irrotational vectors
24-L21	Curl, solenoidal, irrotational vectors
25-L22	Laplacian operator
26-L23	Laplacian operator
27-L24	Unit-III Introduction
28-L25	Integration of point function

29-L26	Integration of point function
30-L27	Integration of point function
31-L28	Line integral
32-L29	Line integral
33-L30	Line integral
34- P3	**Department Seminar**
35-L31	Surface integral
36-L32	**Allotting portion for Internal Test-II**
	Internal Test II begins03-09-2018
37- L33	Surface integral
38- IT-II	**Internal Test-II**
39-L34	Unit-IV Introduction
40-L35	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Volume integral
42- L37	Volume integral
43- L38	Gauss divergence theorem (statement only)
44- P4	**College level meeting/ function**
45-L39	Gauss divergence theorem (statement only)
46-L40	Problems
47-L41	Problems
48-L42	Unit-V Introduction
49-L43	Greens theorem and Stoke’s theorem
50-L44	**Allotting portion for Internal Test-III**
	Internal Test III begins08-10-2018
51 L45	Greens theorem and Stoke’s theorem
52- L46	Problems
53-IT-III	**Internal Test-III**
54-L47	Problems
55-L48	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test22-10-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

Course Outcomes

Learning Outcomes	**Cos** of the course “<Vector Calculus>”
CO1	Acquire basic knowledge of vector differentiation and vector

	integration
CO2	Enable the students to solve problems related to that

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Practical-Programming with C++ and M.S-Office C++
Course Code	**HMAE21**
Class	II year (2014-2015)
Semester	Even
Staff Name	Mr.Stalin Alexis
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To get the Knowledge to develop a C++ program for a given problem.

Syllabus

Text: Object Oriented Programming with CH (Fourth Edition), E. Balagurusamy-TMH Publications. Programming Exercises 5.2, 5.5,6.2 and 7.4, 7.3.7.5, 9.1 and 9.2. 10.3 and 11.1, 11.3 and 11.2.

Ms-Office

Features in word:
1. Creating a Document 2. Formatting a Document 3. Adding Headers and Footers 4. Table creation and Manipulation 5. Entering and editing Formulas and Symbols 6. Inserting a Graphics to a document 7. Mail Merge

Features in Excel:
1. Entering and Editing Formulas 2. Graphs and Charts 3. Simple calculations using Mathematical Statistical/ Logical functions 4. Cell formatting 5. Sorting 6. Inserting Images

Features in Power Point: 1. Creating a simple presentation 2. Adding Transition effects to a presentation 3. Adding Animation effects to a presentation 4. Adding sound effect to a presentation 5. Creating Hyperlinks between slides 6. Changing the background 7. Inserting Images

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2014
1-L1	MS Office-Introduction
2-L2	**Features in word**
3- L3	Creating a Document
4-L4	Formatting a Document
5-L5	Formatting a Document
6-L6	Lab
7-L7	Adding Headers and Footers
8-L8	Adding Headers and Footers
9-L9	Table creation and Manipulation
10-P1	**Inauguration of Mathematics Association**
11-L10	Table creation and Manipulation
12-L11	Lab
13-L12	Entering and editing Formulas and Symbols
14-L13	Entering and editing Formulas and Symbols
15-L14	Lab
16-L15	Inserting a Graphics to a document
17-L16	Inserting a Graphics to a document
18-L17	Mail Merge
19-L18	Mail Merge
20-L19	Lab
21-L20	**Features in Excel**
22-L21	Entering and Editing Formulas
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins(19-01-2015)
24-L23	Entering and Editing Formulas
25-L24	Graphs and Charts
26-IT-1	**Internal Test-I**
27-L25	Graphs and Charts
28-L26	Lab
29-L27	Simple calculations using Mathematical Statistical/ Logical functions
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Simple calculations using Mathematical Statistical/ Logical functions
32- L30	Simple calculations using Mathematical Statistical/ Logical functions
33- L31	Simple calculations using Mathematical Statistical/ Logical functions
34-P2	**College level meeting/Cell function**
35- L32	Lab
36- L33	Cell formatting
37- L34	Cell formatting
38- L35	Sorting
39- L36	Sorting
40- L37	Inserting Images
41- L38	Inserting Images

42- L39	Lab
43- L40	**Features in Power Point**
44- L41	Creating a simple presentation
45- L42	Creating a simple presentation
46- L43	Lab
47- L44	Adding Transition effects to a presentation
48- L45	Adding Transition effects to a presentation
49- L46	Adding Transition effects to a presentation
50- L47	Lab
51- P3	**Department Seminar**
52- L48	Adding Animation effects to a presentation
53- L49	Adding Animation effects to a presentation
54- L50	Adding Animation effects to a presentation
55- L51	Lab
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(16-02-2015)
57-L53	Adding sound effect to a presentation
58-L54	Adding sound effect to a presentation
59-IT-II	**Internal Test-II**
60- L55	Lab
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Creating Hyperlinks between slides
63- L58	Creating Hyperlinks between slides
64- L59	Creating Hyperlinks between slides
65- L60	Lab
66- L61	Changing the background
67- L62	Changing the background
68- L63	Changing the background
69- L64	Lab
70- L65	Inserting Images
71- L66	Inserting Images
72- L67	Inserting Images
73- L68	Lab
74-P4	**College level meeting/ function**
75- L69	Lab
76- L70	Model Practical
77- L71	Model Practical
78- L72	Model Practical
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins(16-03-2015)
80- L74	Lab
81- L75	Lab
82-IT-III	**Internal Test-III**
83- L76	Lab
84- L77	**Test Paper distribution and result analysis**
85- L78	Lab
	Entering Internal Test-III Marks into University portal

86- L79	**Model Test Begins (16-04-2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course "Practical-Programming with C++ and M.S-Office C++"
CO1	Enable the students to develop a C++ program for a given problem.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Algebra II
Course Code	**HMAM21**
Class	II year (2014-2015)
Semester	Even
Staff Name	Dr. Mrs. G.S. Grace Prema
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Semester Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Define the real numbers, least upper bounds, and the triangle inequality.
- Define functions between sets; equivalent sets; finite, countable and uncountable sets. Recognize convergent, divergent, bounded, Cauchy and monotone sequences.
- Calculate the limit superior, limit inferior, and the limit of a sequence.

Syllabus

Tex Book: Topics in Algebra, Second Edition, I.N.Herstein, Willey India Edition.

Unit 1: Algebra of linear transformations-characteristic roots. (Sections 6.1 and 6.2) Problems: Section 6.1(1 to 7, 10 to 13 and 17 to 21), Section 6.2(1 to 8)

Unit 2: Canonical forms: Triangular Forms-Nilpotent Transformations. (Sections 6.4 and 6.5) Problems: Section 6.4(1 to 6)

Unit 3: Trace and Transpose-Hermitian. Unitary and Normal transformations (Sections 6.8 and 6.10) Problems: Section 6.8(1 to 14). Section 6.10(1 to 12, 19 to 21)

Unit 4: Extension fields-roots of polynomials (Sections 5.1 and 5.3) Problems: Section 5.1(1 to 15) and Section 5.3(1 to 7)

Unit 5: More about roots-Finite fields. (Sections 5.5 and 7.1) Problems: Section 5.5(1 to 3) and Section 7.1(1 to 7)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03-12-2014
1-L1	Introduction
2-L2	Algebra of linear transformations
3- L3	Algebra of linear transformations
4-L4	Algebra of linear transformations
5-L5	Algebra of linear transformations
6-L6	characteristic roots
7-L7	characteristic roots
8-L8	characteristic roots
9-L9	characteristic roots
10-P1	**Inauguration of Mathematics Association**
11-L10	Problems: Section 6.1(1 to 3)
12-L11	Problems: Section 6.1(4 to 7)
13-L12	Problems: Section 6.1(10 to 13)
14-L13	Problems: Section 6.1(10 to 13)
15-L14	Problems: Section 6.1(17 to 21)
16-L15	Problems: Section 6.1(17to 21)
17-L16	Problems: Section 6.2(1 to 4)
18-L17	Problems: Section 6.2(5 to 8)
19-L18	Canonical forms
20-L19	Canonical forms
21-L20	Canonical forms
22-L21	Triangular Forms
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins (19-01-2015)
24-L23	Triangular Forms
25-L24	Triangular Forms
26-IT-1	**Internal Test-I**
27-L25	Nilpotent Transformations
28-L26	Nilpotent Transformations
29-L27	Nilpotent Transformations
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Problems: Section 6.4(1 to 3)
32- L30	Problems: Section 6.4(4 to 6)

33- L31	Trace and Transpose
34-P2	**College level meeting/Cell function**
35- L32	Trace and Transpose
36- L33	Trace and Transpose
37- L34	Trace and Transpose
38- L35	Hermitian
39- L36	Hermitian
40- L37	Hermitian
41- L38	Unitary and Normal transformations
42- L39	Unitary and Normal transformations
43- L40	Unitary and Normal transformations
44- L41	Problems: Section 6.8(1 to 4)
45- L42	Problems: Section 6.8(5 to 9)
46- L43	Problems: Section 6.8(10 to 14)
47- L44	Problems: Section 6.10(1 to 4)
48- L45	Problems: Section 6.10(5 to 8)
49- L46	Problems: Section 6.10(9 to 12)
50- L47	Problems: Section 6.10(19 to 21)
51- P3	**Department Seminar**
52- L48	Extension fields
53- L49	Extension fields
54- L50	roots of polynomials
55- L51	roots of polynomials
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins (16-02-2015)
57-L53	Problems: Section 5.1(1 to 4)
58-L54	Problems: Section 5.1(5 to 9)
59-IT-II	**Internal Test-II**
60- L55	Problems: Section 5.1(10 to 13)
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems: Section 5.1(14 to 15)
63- L58	Problems: Section 5.3(1 to 4)
64- L59	Problems :Section 5.3(5 to 7)
65- L60	More about roots
66- L61	More about roots
67- L62	More about roots
68- L63	More about roots
69- L64	More about roots
70- L65	Finite fields
71- L66	Finite fields
72- L67	Finite fields
73- L68	Finite fields
74-P4	**College level meeting/ function**
75- L69	Finite fields
76- L70	Problems: Section 5.5(1 to 3)
77- L71	Problems: Section 7.1(1 to 4)
78- L72	Problems: Section 7.1(5 to 7)

79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins (16-03-2015)
80- L74	Problems Discussion
81- L75	Problems Discussion
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test Begins (16-04-2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra II"
CO1	Knowledge gained about Ring Homomorphisms.
CO2	Acquisition of knowledge about Euclidean rings, Polynomial rings, Certain radicals of a ring, Jacobson radical of a ring and Semi simple ring.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis II
Course Code	**HMAM22**
Class	I year (2014-2015)
Semester	Even
Staff Name	Dr. Mrs. J. Suresh Suseela
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Semester Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Define the real numbers, least upper bounds, and the triangle inequality.
- Define functions between sets; equivalent sets; finite, countable and uncountable sets. Recognize convergent, divergent, bounded, Cauchy and monotone sequences.
- Calculate the limit superior, limit inferior, and the limit of a sequence.

Syllabus

Text: Principles of Mathematical Analysis, Third Edition, Walter Rudin- Mcgraw-Hill International Book Company.

Unit 1: Definition and Properties of Integral-Integration and Differentiation. (Section 6.1 to 6.22) Exercise Problems: Chapter 6(1 to 6 and 10 to 14)

Unit 2: Integration of vector valued functions - Rectifiable ares, Sequence and series of functions: Discussion of main problem-Uniform ConvergenceUniform convergence and continuity. (Section 6.23 to 6.27 and 7.1 to 7.15) Exercise Problems: Chapter 6(15 to 17) and Chapter 7(1 to 9)

Unit 3: Uniform Convergence and Integration- Uniform Convergence and Differentiation- Equicontinuous families of functions-The Stone Weierstrass theorem. (Section 7.16 to 7.33) Exercise Problems: Chapter 7(20 to 24)

Unit 4: Power series-The exponential, logarithmic and trigonometrical functions (Section 8.1 to 8.7) Exercise Problems: Chapter 8(1 to 8)

Unit 5: The algebraic completeness of the complex field-Fourier series-The Gamma function (Section 8.8 to 8.22) Exercise Problems: Chapter 8(12 to 16)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2014
1-L1	Introduction
2-L2	Definition and Properties of Integral
3- L3	Definition and Properties of Integral
4-L4	Definition and Properties of Integral
5-L5	Definition and Properties of Integral
6-L6	Integration and Differentiation
7-L7	Integration and Differentiation
8-L8	Integration and Differentiation
9-L9	Integration and Differentiation
10-P1	**Inauguration of Mathematics Association**
11-L10	Exercise Problems: Chapter 6(1 to 3)
12-L11	Exercise Problems: Chapter 6(4 to6)
13-L12	Exercise Problems: Chapter 6(10 to 14)
14-L13	Integration of vector valued functions
15-L14	Integration of vector valued functions
16-L15	Integration of vector valued functions
17-L16	Rectifiable ares
18-L17	Rectifiable ares
19-L18	Sequence and series of functions
20-L19	Sequence and series of functions
21-L20	Discussion of main problem
22-L21	Discussion of main problem
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins (19-01-2015)
24-L23	Uniform convergence and continuity
25-L24	Uniform convergence and continuity
26-IT-1	**Internal Test-I**
27-L25	Uniform convergence and continuity
28-L26	Exercise Problems: Chapter 6(15 to 17)
29-L27	Exercise Problems: Chapter 7(1 to 4)
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Exercise Problems: Chapter 7(5 to 9)
32- L30	Uniform Convergence and Integration
33- L31	Uniform Convergence and Integration
34-P2	**College level meeting/Cell function**

35- L32	Uniform Convergence and Differentiation
36- L33	Uniform Convergence and Differentiation
37- L34	Equicontinuous families of functions
38- L35	Equicontinuous families of functions
39- L36	Equicontinuous families of functions
40- L37	The Stone Weierstrass theorem
41- L38	The Stone Weierstrass theorem
42- L39	Exercise Problems: Chapter 7(20 to 24)
43- L40	Power series
44- L41	The exponential
45- L42	The exponential
46- L43	logarithmic and trigonometrical functions
47- L44	logarithmic and trigonometrical functions
48- L45	logarithmic and trigonometrical functions
49- L46	logarithmic and trigonometrical functions
50- L47	logarithmic and trigonometrical functions
51- P3	**Department Seminar**
52- L48	Exercise Problems: Chapter 8(1 to 4)
53- L49	Exercise Problems: Chapter 8(5 to 8)
54- L50	The algebraic completeness of the complex field
55- L51	The algebraic completeness of the complex field
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins (16-02-2015)
57-L53	The algebraic completeness of the complex field
58-L54	The algebraic completeness of the complex field
59-IT-II	**Internal Test-II**
60- L55	The algebraic completeness of the complex field
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Fourier series
63- L58	Fourier series
64- L59	Fourier series
65- L60	Fourier series
66- L61	Fourier series
67- L62	The Gamma function
68- L63	The Gamma function
69- L64	The Gamma function
70- L65	The Gamma function
71- L66	The Gamma function
72- L67	Exercise Problems: Chapter 8(12 to 14)
73- L68	Exercise Problems: Chapter 8(15,16)
74-P4	**College level meeting/ function**
75- L69	Problems
76- L70	Problems
77- L71	Problems
78- L72	Problems
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins (16-03-2015)

80- L74	Problem Discussion
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test Begins (16-04-2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course "Analysis II"
CO1	Knowledge gained about Integration of vector valued functions.
CO2	Knowledge gained about The Stone Weierstrass Theorem, Fourier Series and The Gamma function.
CO3	Acquisition of knowledge about Uniform Convergence, Uniform Convergence and Continuity, Uniform Convergence and Integration, Uniform Convergence and Differentiation.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Classical Mechanics
Course Code	**HMAM23**
Class	II year (2014-2015)
Semester	Even
Staff Name	Mrs. T. Santhakumari
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To study mechanical systems under generalized coordinate systems, virtual work, energy and momentum
- To study mechanics developed by Newton, Langrange, Hamilton and Jacobi

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begins on 03-12-2014
1-L1	Unit I – Introduction: Mechanics of a single particle
2-L2	Conservation theorem for linear momentum of a single particle
3- L3	Conservation theorem for angular momentum of a single particle
4-L4	Some remarks on conservation theorems
5-L5	Energy conservation theorem
6-L6	Problem discussion on mechanics of a single particle
7-L7	Mechanics of a system of particles
8- P1	**Inauguration of Mathematics Association**
9- L8	Conservation theorem for linear momentum of a system of particles
10- L9	Conservation theorem for angular momentum of a system of particles
11-L10	Theorems on Kinetic energy
12-L11	Problem discussion on Kinetic energy
13-L12	Energy conservation theorem
14-L13	Exercise problems using conservation theorem
15-L14	Unit II – Constraints: Different types of constraints
16-L15	Examples for holonomic constraints and non-holonomic constraints
17- L16	Virtual work and D'Alembert's Principle
18- L17	Lagrange's equation from D'Alembert's Principle – Theorem
19- L18	Lagrange's equation for non-holonomic constraints

20- L19	Velocity dependent potentials
21- L20	Rayleigh Dissipation function **Allotting portion for Internal Test-I**
	Internal Test I begins (19-01-2015)
22- L21	Lagrangian for charged particle and some problems
23- IT-1	**Internal Test-I**
24- L22	Applications of the Lagrangian equation
25- L23	Lagrangian for a single particle (i) in cartesian coordinates (ii) in polar coordinates
26- L24	Lagrangian for Atwood machine **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Time dependent potential
28- L26	Problem - bead sliding on rotating wire and some exercise problems
29- L27	Unit III – Variation principles and lagrange’s equation - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Hamilton’s principle
32-L29	Stationary values
33-L30	Path of a system – congugration
34- L31	Path of a system – congugration
35- L32	Techniques of calculus of variation - theorem
36- L33	Lagrange’s equation from Hamilton’s principle
37- L34	Shortest distance between two point in a space
38- L35	Minimum surface of revolution
39- L36	Brachistochrone problem
40- L37	Extension of Hanilton’s Principle
41- L38	Extension of Hanilton’s Principle non-holonomic system
42-P3	**Department Seminar**
43- L39	Unit IV –Two body central force problem
44- L40	Reduction to one body problem
45- L41	The equations of motion and first integral theorem
46- L42	The Kepler’s Second law of planetary motion
47- L43	Derivatives **Allotting portion for Internal Test-II**
	Internal Test II begins (16-02-2015)
48- L44	Illustrations about derivative and motion
49-IT-II	**Internal Test-II**
50-L45	The equivalent one dimensional problems
51- L46	Classification of orbits - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Examples of the method occurs for a linear restoring force
53- L48	Inverse square law for circular orbits
54- L49	The virial theorem.

55- L50	Problem discussion based on the virial's theorem
56- L51	Unit V – The differential equation for the orbit
57- L52	Problems on differential equation for the orbit
58- L53	Integrable power-law potentials
59-P4	**College level meeting/ function**
60- L54	The Kepler problem
61- L55	Inverse square law of force
62- L56	Nature of the orbit depends on *e* and *E*
63- L57	The motion in time in the Kepler problem
64- L58	Deriving the approximate version of the Kepler's third law – **Allotting portion for Internal Test-III**
	Internal Test III begins (16-03-2015)
65- L59	Existence of conserved vector **A** for the Kepler problem
66- L60	The Laplace-Runge-Lenz vector
67-IT-III	**Internal Test-III**
68- L61	Problem discussion
69- L62	Scattering in a central force field
70- L63	Relation of orbit parameters and scattering angle - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins(16-04-2015)
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2015

Course Outcomes

Learning Outcomes	**COs** of the course "Classical Mechanics"
CO1	Able to understand D' Alembert's Principle and simple applications of the Lagrangian Formulation.
CO2	Able to analyze the Derivation of Lagrange's Equations from Hamilton's Principle and Extension of Hamilton's Principle to Non-holonomic Systems
CO3	Able to study the concept of the Equations of Motion and the Equivalent One-Dimensional Problems.
CO4	Able to understand the Kepler Problem and Inverse-Square Law of Force.
CO5	Able to distinguish the concept of the Hamilton Equations of Motion and the Principle of Least Action.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Ordinry Differential Equation
Course Code	**HMAM24**
Class	I year (2014-2015)
Semester	Even
Staff Name	Dr. Mr. A. Alwyn Asir
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2014
1-L1	Introduction
2-L2	Second Order linear equations
3- L3	General solution of the Homogeneous equations
4-L4	General solution of the Homogeneous equations
5-L5	General solution of the Homogeneous equations
6-L6	The use of a known solution to find another
7-L7	The use of a known solution to find another
8-L8	The use of a known solution to find another
9-L9	The method of variation of parameters
10-P1	**Inauguration of Mathematics Association**
11-L10	The method of variation of parameters
12-L11	The method of variation of parameters
13-L12	The method of variation of parameters
14-L13	Power series solutions
15-L14	Power series solutions
16-L15	A review of power series solutions
17-L16	A review of power series solutions
18-L17	A review of power series solutions
19-L18	Series solution of first order equations
20-L19	Series solution of first order equations
21-L20	Series solution of first order equations
22-L21	Series solution of first order equations
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins (19-01-2015)
24-L23	Second order equations
25-L24	Second order equations
26-IT-1	**Internal Test-I**
27-L25	Second order equations
28-L26	Ordinary points
29-L27	Ordinary points
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Ordinary points
32- L30	Regular singular points
33- L31	Regular singular points
34-P2	**College level meeting/Cell function**

35- L32	Regular singular points
36- L33	Regular singular points
37- L34	Legendre polynomials
38- L35	Legendre polynomials
39- L36	Legendre polynomials
40- L37	Properties of Legendre Polynomials
41- L38	Properties of Legendre Polynomials
42- L39	Properties of Legendre Polynomials
43- L40	Bessel functions
44- L41	Bessel functions
45- L42	Bessel functions
46- L43	Bessel functions
47- L44	The Gamma functions
48- L45	The Gamma functions
49- L46	The Gamma functions
50- L47	The Gamma functions
51- P3	**Department Seminar**
52- L48	Properties of Bessel functions
53- L49	Properties of Bessel functions
54- L50	Properties of Bessel functions
55- L51	Properties of Bessel functions
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins (16-02-2015)
57-L53	Linear systems
58-L54	Linear systems
59-IT-II	**Internal Test-II**
60- L55	Linear systems
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Linear systems
63- L58	Linear systems
64- L59	Problems
65- L60	Problems
66- L61	Problems
67- L62	Problems
68- L63	Homogeneous linear systems with constant coefficients
69- L64	Homogeneous linear systems with constant coefficients
70- L65	Homogeneous linear systems with constant coefficients
71- L66	Homogeneous linear systems with constant coefficients
72- L67	Homogeneous linear systems with constant coefficients
73- L68	Homogeneous linear systems with constant coefficients
74-P4	**College level meeting/ function**
75- L69	Homogeneous linear systems with constant coefficients
76- L70	Homogeneous linear systems with constant coefficients
77- L71	Homogeneous linear systems with constant coefficients
78- L72	Problem discussion
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins(16-03-2015)

80- L74	Problem discussion
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test Begins (16-04-2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2015

Course Outcomes

Learning Outcomes	**COs** of the course "Ordinary Differential Equation''
CO1	Knowledge gained about Second Order linear equations and Power series solutions.
CO2	Acquisition of knowledge about Legendre polynomials, Bessel functions, The Gamma functions and Linear systems.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Programming with C++
Course Code	HMAE11
Class	I year (2014-2015)
Semester	Odd
Staff Name	Mr. K. Stalin Alexis
Credits	5
L. Hours /P. Hours	7 / WK
Total 105Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 95 Hrs (5 units; 5×19=95; 19Hrs /unit)	

Course Objectives

- To develop programming skills using the fundamentals and basics of C language.
- To study the advantages of user defined data type that provides flexibility for application development.
- To enable effective usage of arrays, structures, functions and pointers.
- Derive appropriate numerical methods to solve algebraic and transcendental equations.
- Derive appropriate numerical methods to solve a linear system of equations.
- Prove results for various numerical root finding methods

Syllabus

Text: Object Oriented Programming with C++(Fourth Edition), E.Balagurusamy-TMH Publications.

mming with C++

Unit 1: Beginning with CH, Tokens. Expressions and Control structures. (Chapter 2 and 3, including Debugging and Program exercises)

Unit 2: Functions in C++, Classes and objects. (Chapter 4 and 5. including Debugging and Program exercises)

Unit 3: Constructors and Destructors-Operator Over loading-Type Conversions. (Chapter 6 and 7, including Debugging and Program exercises)

Unit 4: Inheritance-Extending Classes-Pointers- Virtual Functions-Polymorphisms, Chapter 8 and 9, including Debugging and Program exercises)

Unit 5: Managing console I/O operations-Working with files. (Chapter 10 and 11, including Debugging and Program exercises)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2014
1-L1	Unit-I Introduction
2-L2	Beginning with C+
3- L3	Beginning with C+
4-L4	Beginning with C+
5-L5	Lab
6-L6	Tokens
7-L7	Tokens
8-L8	Tokens
9-L9	Lab
10-L10	Expressions
11-L11	Expressions
12-L12	Expressions
13-P1	**Welcoming of First year and Inauguration of Mathematics Association**
14-L13	Lab
15-L14	Control structures
16-L15	Control structures
17-L16	Control structures
18-L17	Lab
19-L18	Lab
20-L19	Unit-II Introduction
21-L20	Functions in C++
22-L21	Functions in C++
23-L22	Functions in C++
24-L23	Lab
25-L24	**Allotting portion for Internal Test-I**
	Internal Test I begins(30-07-2014)
26-L25	Classes
27-L26	Classes
28-IT-1	**Internal Test-I**
29-L27	Classes
30-L28	Lab

31- L29	objects
32- L30	objects
33- L31	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
34- L32	Objects
35- L33	Lab
36- L33	Lab
37- L35	Unit-III Introduction
38- L36	Constructors
39- L37	Constructors
40-P2	**College level meeting/Cell function**
41- L38	Constructors
42- L39	Lab
43- L40	Destructors
44- L41	Destructors
45- L42	Destructors
46- L43	Lab
47- L44	Operator Over loading
48- L45	Operator Over loading
49- L46	Operator Over loading
50- L47	Lab
51- L48	Type Conversions
52- L49	Type Conversions
53- L50	Type Conversions
54- P3	**Department Seminar**
55- L51	Lab
56- L52	Lab
57- L53	Unit-IV Introduction
58- L54	**Allotting portion for Internal Test-II**
59- L55	**Internal Test II begins(18-08-2014)**
60- L56	Inheritance
61- L57	Inheritance
62- IT-II	**Internal Test-II**
63- L58	Inheritance
64- L59	Lab
65- L60	Extending Classes
66- L61	Extending Classes
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Extending Classes
69- L64	Lab
70- L65	Pointers
71- L66	Pointers
72- L67	Pointers
73- L68	Lab
74- L69	Virtual Functions
75- L70	Virtual Functions
76- L71	Virtual Functions

77- L72	Lab
78- L73	Polymorphisms
79- L74	Polymorphisms
80- L75	Polymorphisms
81- L76	Lab
82- P4	**College level meeting/ function**
83- L77	Lab
84- L78	Unit-V Introduction
85- L79	Managing console I/O operations
86- L80	Managing console I/O operations
87- L81	Managing console I/O operations
88- L82	Lab
89- L83	Working with files
90- L84	Working with files
91- L85	Working with files
92- L86	Lab
93- L87	Lab
94- L88	**Allotting portion for Internal Test-III**
	Internal Test III begins(15-09-2014)
95- L89	Lab
96- IT-III	**Internal Test-III**
97- L90	Lab
98- L91	Lab
99- L92	**Test Paper distribution and result analysis**
100- L93	Revision
	Entering Internal Test-III Marks into University portal
101- MT	**Model TestBegins (24-10-2014)**
102- MT	**Model Test**
103- MT	**Model Test**
104- L94	**Model test paper distribution and previous year university question paper discussion**
105- L-95	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-10-2014

Course Outcomes

Learning Outcomes	**COs** of the course “Programming with C++”
CO1	Read, understand and trace the execution of programs written in C language.
CO2	Write programs that perform operations using derived data types
CO3	Solve an algebraic or transcendental equation using an appropriate numerical method
CO4	Solve a linear system of equations using an appropriate numerical method.
CO5	Perform an error analysis for a given numerical method

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Algebra-I
Course Code	HMAM11
Class	I year (2014-2015)
Semester	Odd
Staff Name	Dr. Mrs. Grace Prema
Credits	5
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Course Objectives

- Define the real numbers, least upper bounds, and the triangle inequality.
- Define functions between sets; equivalent sets; finite, countable and uncountable sets. Recognize convergent, divergent, bounded, Cauchy and monotone sequences.
- Calculate the limit superior, limit inferior, and the limit of a sequence.

Syllabus

1.1 Paper 1-Algebra-I

Text: Topics in Algebra, Second Edition, I.N.Herstein, Willey India Edition.

Unit 1: Homomorphisms - Automorphisms - Cayley's Theorem. (Sections 2.7. 2.8 and 2.9) Problems: Section 2.7(1 to 6 and 8 to 13), Section 2.8(2 to 6) and Section 2.9(all problems)

Unit 2: Permutation groups-Another counting principle-Sylow's Theorems. (Sections 2.10.2.11 and 2.12)

Problems: Section 2.10(1 to 17), Section 2.11(5 to 19) and Section 2.12(1 to 13)

Unit 3: Direct Products-Finite Abelian Groups. (Sections 2.13 and 2.14) Problems: Section 2.13(1 to 10) and Section 2.14(1 to 12)

Unit 4: The Field of Quotients of an Integral Domain-Euclidean Rings-A Particular Euclidean Ring. (Sections 3.6, 3.7 and 3.8) Problems: Section 3.6(1 to 4). Section 3.7(1 to 8) and Section 3.8(1 to 9)

Unit 5: Polynomial Rings-Polynomials over the Rational Field-Polynomials over Commutative Rings (Sections 3.9, 3.10 and 3.11) Problems: Section 3.91 to 7), Section 3.10(1 to 5) and Section 3.11(1 to 15) (Supplementary problems are not included)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2014
1-L1	Unit-I Introduction
2-L2	Homomorphisms
3- L3	Homomorphisms
4-L4	Homomorphisms
5-L5	Automorphisms
6-L6	Automorphisms
7-L7	Automorphisms
8-L8	Cayley's Theorem
9-L9	Problems: Section 2.7(1,2)
10-L10	Problems: Section 2.7(3,4)
11-L11	Problems: Section 2.7(5,6)
12-L12	Problems: Section 2.7(8,9)
13-L13	Problems: Section 2.7(10,11,12,13)
14-L14	Problems: Section 2.8(2,3,4,5)
15-L15	Problems: Section 2.9
16-P1	**Welcoming of First year and Inauguration of Mathematics Association**
17-L16	Problems: Section 2.9
18-L17	Problems: Section 2.9
19-L18	Unit-II Introduction
20-L19	Permutation groups
21-L20	Permutation groups
22-L21	Another counting principle
23-L22	Another counting principle
24-L23	Sylow's Theorems
25-L24	Sylow's Theorems
26-L25	Sylow's Theorems
27-L26	Sylow's Theorems
28-L27	Sylow's Theorems
29-L28	**Allotting portion for Internal Test-I**
	Internal Test I begins(30-07-2014)
30-L29	Problems: Section 2.10(1 to 5)
31- L30	Problems: Section 2.10(6 to 10)
32- IT-1	**Internal Test-I**
33- L31	Problems: Section 2.10(11 to 14)
34- L32	Problems: Section 2.10(15 to 17)
35- L33	Problems: Section 2.11(5 to 10)

36- L34	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
37- L35	Problems: Section 2.11(11 to 15)
38- L36	Problems: Section 2.11(16 to 19)
39- L37	Problems: Section 2.12(1 to 4)
40- P2	**College level meeting/Cell function**
41- L38	Problems: Section 2.12(5 to 8)
42- L39	Problems: Section 2.12(9 to 13)
43- L40	Unit-III Introduction
44- L41	Direct Products
45- L42	Direct Products
46- L43	Direct Products
47- L44	Finite Abelian Groups
48- L45	Finite Abelian Groups
49- L46	Finite Abelian Groups
50- L47	Problems: Section 2.13(1 to 3)
51- L48	Problems: Section 2.13(4 to 6)
52- L49	Problems: Section 2.13(7 to 10)
53- L50	Problems: Section 2.14(1 to 4)
54- L51	Problems: Section 2.14(5 to 8)
55- P3	**Department Seminar**
56-L52	Problems: Section 2.14(9 to 12)
57-L53	Unit-IV Introduction
58-L54	The Field of Quotients of an Integral Domain
59- 55L	The Field of Quotients of an Integral Domain
60- L56	The Field of Quotients of an Integral Domain
61- L57	The Field of Quotients of an Integral Domain
62- L58	**Allotting portion for Internal Test-II**
	Internal Test II begins(18-08-2014)
63- L59	The Field of Quotients of an Integral Domain
64- L60	Euclidean Rings
65- IT-II	**Internal Test-II**
66- L61	Euclidean Rings
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Euclidean Rings
69- L64	Euclidean Rings
70- L65	Euclidean Rings
71- L66	Euclidean Rings
72- L67	A Particular Euclidean Ring
73- L68	A Particular Euclidean Ring
74- L69	A Particular Euclidean Ring
75- L70	A Particular Euclidean Ring
76- L71	A Particular Euclidean Ring
77- L72	A Particular Euclidean Ring
78- L73	Problems: Section 3.6(1 to 4)
79-L74	Problems: Section 3.7(1 to 4)
80-L75	Problems: Section 3.7(5 to 8)

81-L76	Problems: Section 3.8(1 to 3)
82-L77	Problems: Section 3.8(4 to 6)
83-L78	Problems: Section 3.6(7 to 9)
84-L79	Unit-V Introduction
85-L80	Polynomial Rings
86-L81	Polynomial Rings
87-L82	Polynomial Rings
88-L83	Polynomials over the Rational Field
89-L84	Polynomials over the Rational Field
90-P4	**College level meeting/ function**
91-L85	Polynomials over the Rational Field
92-L86	Polynomials over the Rational Field
93-L87	Polynomials over Commutative Rings
94-L88	Polynomials over Commutative Rings
95-L89	Polynomials over Commutative Rings
96-L90	Polynomials over the Rational Field
97-L91	Polynomials over Commutative Rings
98-L92	Problems: Section 3.9(1 to 3)
99-L93	Problems: Section 3.9(4 & 5)
100-L94	Problems: Section 3.9(6 & 7)
101-L95	Problems: Section 3.10(1 to 3)
102-L96	Problems: Section 3.10(4 to 5)
103-L97	Problems: Section 3.11(1 to 3)
104-L98	Problems: Section 3.11(4 to 6)
105-L99	Problems: Section 3.11(7 to 9)
106-L100	Problems: Section 3.11(10 & 11)
107-L101	Problems: Section 3.11(12 & 13)
108-L102	Problems: Section 3.11(14 & 15)
109- L103	**Allotting portion for Internal Test-III**
	Internal Test III begins(15-09-2014)
110- L104	Revision
111- L105	Revision
112-IT-III	**Internal Test-III**
113- L106	Revision
114- L107	**Test Paper distribution and result analysis**
115- L108	Revision
	Entering Internal Test-III Marks into University portal
116-MT	**Model Test Begins (24-10-2014)**
117-MT	**Model Test**
118-MT	**Model Test**
119-L109	**Model test paper distribution and previous year university question paper discussion**
120-L110	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-10-2014

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra-I"
CO1	Learners will acquire knowledge on Counting Principle and Homomorphisms.
CO2	Knowledge gained about Automorphisms and Cayley's theorem.
CO3	Learners will gain knowledge about Permutation groups, Sylow's theorems and Direct products.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis-I
Course Code	HMAM12
Class	I year (2014-2015)
Semester	Odd
Staff Name	Dr. Mrs. J. sureshSuseela
Credits	5
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Course Objectives

- Define the real numbers, least upper bounds, and the triangle inequality.
- Define functions between sets; equivalent sets; finite, countable and uncountable sets. Recognize convergent, divergent, bounded, Cauchy and monotone sequences.
- Calculate the limit superior, limit inferior, and the limit of a sequence.

Syllabus

1.2 Paper 2-Analysis-I

Text: Principles of Mathematical Analysis, Third Edition, Walter Rudin-Mcgraw-Hill International Book Company.

Unit 1: Metric spaces-Compact sets-Perfect sets-Cantor sets-Connected sets. (Sections 2.15 to 2.47) Exercise Problems: Chapter 2(5 to 20)

Unit 2: Convergence sequences-Series-The number e. (Sections 3.1 to 3.32) Exercise Problems: Chapter 3(1 to 8)

Unit 3: The root and ratio tests-Power series-Absolute Convergence-Rearrangements. (Sections 3.33 and 3.55) Exercise Problems: Chapter 39 to 13)

Unit 4: Continuity. (Chapter 4) Exercise Problems: Chapter 4(Ito 5, 14 to 16 and 18 to 20)

Unit 5: Differentiation. (Chapter 5) Exercise Problems: Chapter 5(Ito 12)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2014
1-L1	Unit-I Introduction
2-L2	Metric spaces
3- L3	Metric spaces
4-L4	Metric spaces
5-L5	Metric spaces
6-L6	Metric spaces
7-L7	Compact sets
8-L8	Compact sets
9-L9	Compact sets
10-L10	Compact sets
11-L11	Compact sets
12-L12	Perfect sets
13-L13	Perfect sets
14-L14	Perfect sets
15-L15	Perfect sets
16-P1	**Welcoming of First year and Inauguration of Mathematics Association**
17-L16	Cantor sets
18-L17	Cantor sets
19-L18	Cantor sets
20-L19	Connected sets
21-L20	Connected sets
22-L21	Connected sets
23-L22	Connected sets
24-L23	Exercise Problems: Chapter 2(5 to 7)
25-L24	Exercise Problems: Chapter 2(8 to 10)
26-L25	Exercise Problems: Chapter 2(11 to 13)
27-L26	Exercise Problems: Chapter 2(14 to 17)
28-L27	Exercise Problems: Chapter 2(18 to 20)
29-L28	**Allotting portion for Internal Test-I**
	Internal Test I begins(30-07-2014)
30-L29	Unit-II Introduction
31- L30	Convergence sequences
32- IT-1	**Internal Test-I**
33- L31	Convergence sequences
34- L32	Convergence sequences
35- L33	Convergence sequences
36- L34	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
37- L35	Convergence sequences

38- L36	Series
39- L37	Series
40- P2	**College level meeting/Cell function**
41- L38	Series
42- L39	Series
43- L40	The number e
44- L41	The number e
45- L42	The number e
46- L43	The number e
47- L44	Exercise Problems: Chapter 3(1,2)
48- L45	Exercise Problems: Chapter 3(3,4)
49- L46	Exercise Problems: Chapter 3(5,6)
50- L47	Exercise Problems: Chapter 3(7,8)
51- L48	Unit-III Introduction
52- L49	The root test
53- L50	The root test
54- L51	The ratio test
55- P3	**Department Seminar**
56-L52	The ratio test
57-L53	Power series
58-L54	Power series
59- 55L	Power series
60- L56	Power series
61- L57	Absolute Convergence
62- L58	**Allotting portion for Internal Test-II**
	Internal Test II begins(18-08-2014)
63- L59	Absolute Convergence
64- L60	Absolute Convergence
65- IT-II	**Internal Test-II**
66- L61	Absolute Convergence
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Rearrangements
69- L64	Rearrangements
70- L65	Rearrangements
71- L66	Rearrangements
72- L67	Exercise Problems: Chapter 3(9 to 11)
73- L68	Exercise Problems: Chapter 3(12,13)
74- L69	Unit-IV Introduction
75- L70	Continuity.
76- L71	Continuity.
77- L72	Continuity.
78- L73	Continuity.
79-L74	Continuity.
80-L75	Continuity.
81-L76	Exercise Problems: Chapter 4(1 to 3)
82-L77	Exercise Problems: Chapter 4(4,5)
83-L78	Exercise Problems: Chapter 4(14,15)

84-L79	Exercise Problems: Chapter 4(16,18)
85-L80	Exercise Problems: Chapter 4(19,20)
86-L81	Unit-V Introduction
87-L82	Differentiation
88-L83	Differentiation
89-L84	Differentiation
90-P4	**College level meeting/ function**
91-L85	Differentiation
92-L86	Differentiation
93-L87	Differentiation
94-L88	Differentiation
95-L89	Differentiation
96-L90	Exercise Problems: Chapter 5(1,2)
97-L91	Exercise Problems: Chapter 5(3,4)
98-L92	Exercise Problems: Chapter 5(5,6)
99-L93	Exercise Problems: Chapter 5(7,8)
100-L94	Exercise Problems: Chapter 5(9,10)
101-L95	Exercise Problems: Chapter 5(10)
102-L96	Exercise Problems: Chapter 5(11)
103-L97	Exercise Problems: Chapter 5(12)
104-L98	Problems
105-L99	Problems
106-L100	Problems
107-L101	Problems
108-L102	Problems
109- L103	**Allotting portion for Internal Test-III**
	Internal Test III begins(15-09-2014)
110- L104	Revision
111- L105	Revision
112-IT-III	**Internal Test-III**
113- L106	Revision
114- L107	**Test Paper distribution and result analysis**
115- L108	Revision
	Entering Internal Test-III Marks into University portal
116-MT	**Model TestBegins (24-10-2014)**
117-MT	**Model Test**
118-MT	**Model Test**
119-L109	**Model test paper distribution and previous year university question paper discussion**
120-L110	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-10-2014

Course Outcomes

Learning Outcomes	**COs** of the course “Analysis-I”
CO1	Acquisition of knowledge about Metric spaces, Compact sets, Perfect sets, Cantor sets and Connected sets.
CO2	Learners will gain knowledge about Convergence sequences, Sub sequences, Cauchy sequence, Lower and Upper limits, Series and Some special sequences
CO3	Knowledge gained about Root test and Ratio test
CO4	Students will gain knowledge on Continuity, Limit of functions and Discontinuous.
CO5	Students will know about Differentiation, Derivative of a real function, L’Hospital Rule and Taylor’s theorem

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2014-2015)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Probability & Statistics
Course Code	HMAM13
Class	I year (2014-2015)
Semester	Odd
Staff Name	Dr. Mr. Alwyn Asir
Credits	5
L. Hours /P. Hours	7 / WK
Total 105Hrs/Semester Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 95 Hrs (5 units; 5×19=95; 19Hrs /unit)	

Syllabus

1.3 Paper 3-Probability and Statistics

Text: Introduction to Mathematical Statistics, Fourth Edition-Robert V. Hogg and Allen T.Craig. Pearson Education Asia.

Unit 1: Chebyshev's inequality-Conditional Probability and Stochastic Independence. (Chapter 1-Section 1.11 and Chapter 2) Exercise Problems: Chapter 1(1.104, 1.105. 1.106) and Chapter 2(2.1 to 2.33)

Unit 2: Some special Distributions.(Chapter 3) Exercise Problems: Chapter 3(3.1 to 3.54 and 3.62 to 3.65)

Unit 3: Sampling Theory-Transformation of Variables-t and F distributions. (Chapter 4-Section 4.1 to 4.4) Exercise Problems: Chapter 4(4.1 to 4.41)

Unit 4: Change of variable Technique-The MGF technique-Distributions of X and

- Expectations of functions of random variables.

(Chapter 4-Section 4.5 to 49) Exercise Problems: Chapter 4 (4.42, 4.43, 4.50 to 4.60.4.68 to 4.74 and 4.83 to 4.98)

Unit 5: Limiting Distributions. (Chapter 5)

Exercise Problems: Chapter 5(5.1 to 5.16, 5.20 to 5.27 and 5.30 to 5.35)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2014
1-L1	Unit-I Introduction
2-L2	Chebyshev's inequality
3- L3	Chebyshev's inequality
4-L4	Chebyshev's inequality
5-L5	Chebyshev's inequality
6-L6	Conditional Probability
7-L7	Conditional Probability
8-L8	Conditional Probability
9-L9	Conditional Probability
10-L10	Stochastic Independence
11-L11	Stochastic Independence
12-L12	Stochastic Independence
13-P1	**Welcoming of First year and Inauguration of MathematicsAssociation**
14-L13	Stochastic Independence
15-L14	Exercise Problems: Chapter 1(1.104, 1.105. 1.106)
16-L15	Exercise Problems: Chapter 2(2.1-2.5)
17-L16	Exercise Problems: Chapter 2(2.6-2.9)
18-L17	Exercise Problems: Chapter 2(2.10-2.15)
19-L18	Exercise Problems: Chapter 2(2.16-2.20)
20-L19	Exercise Problems: Chapter 2(2.21-2.24)
21-L20	Exercise Problems: Chapter 2(2.25-2.29)
22-L21	Exercise Problems: Chapter 2(2.30-2.33)
23-L22	Unit-II Introduction
24-L23	Some special Distributions
25-L24	**Allotting portion for Internal Test-I**
	Internal Test I begins (30-07-2014)
26-L25	Some special Distributions
27-L26	Some special Distributions
28-IT-1	**Internal Test-I**
29-L27	Some special Distributions
30-L28	Some special Distributions
31- L29	Some special Distributions
32- L30	Some special Distributions
33- L31	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
34- L32	Exercise Problems: Chapter 3(3.1 to 3.8)
35- L33	Exercise Problems: Chapter 3(3.9 to 3.16)
36- L33	Exercise Problems: Chapter 3(3.17 to 3.24)
37- L35	Exercise Problems: Chapter 3(3.25 to 3.30)
38- L36	Exercise Problems: Chapter 3(3.31 to 3.38)
39- L37	Exercise Problems: Chapter 3(3.39 to 3.48)
40-P2	**College level meeting/Cell function**
41- L38	Exercise Problems: Chapter 3(3.49 to 3.54)

42- L39	Exercise Problems: Chapter 3(3.62 to 3.65)
43- L40	Unit-III Introduction
44- L41	Sampling Theory
45- L42	Sampling Theory
46- L43	Sampling Theory
47- L44	Sampling Theory
48- L45	Transformation of Variables
49- L46	Transformation of Variables
50- L47	Transformation of Variables
51- L48	Transformation of Variables
52- L49	t distributions
53- L50	t distributions
54- P3	**Department Seminar**
55- L51	t distributions
56- L52	t distributions
57- L53	F distributions
58- L54	**Allotting portion for Internal Test-II**
59- L55	**Internal Test II begins(18-08-2014)**
60- L56	F distributions
61- L57	F distributions
62- IT-II	**Internal Test-II**
63- L58	Exercise Problems: Chapter 4(4.1 to 4.10)
64- L59	Exercise Problems: Chapter 4(4.11 to 4.20)
65- L60	Exercise Problems: Chapter 4(4.21 to 4.30)
66- L61	Exercise Problems: Chapter 4(4.31 to 4.41)
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Unit-IV Introduction
69- L64	Change of variable Technique
70- L65	Change of variable Technique
71- L66	The MGF technique
72- L67	The MGF technique
73- L68	Distributions of X
74- L69	Expectations of functions of random variables
75- L70	Exercise Problems: Chapter 4 (4.42, 4.43, 4.50 to 4.60)
76- L71	Exercise Problems: Chapter 4 (4.68 to 4.74)
77- L72	Exercise Problems: Chapter 4 (4.83 to 4.90)
78- L73	Exercise Problems: Chapter 4 (4.91 to 4.98)
79- L74	Unit-V Introduction
80- L75	Limiting Distributions
81- L76	Limiting Distributions
82- P4	**College level meeting/ function**
83- L77	Limiting Distributions
84- L78	Limiting Distributions
85- L79	Limiting Distributions
86- L80	Limiting Distributions
87- L81	Limiting Distributions
88- L82	Exercise Problems: Chapter 5(5.1 to 5.8)

89- L83	Exercise Problems: Chapter 5(5.9 to 5.16)
90- L84	Exercise Problems: Chapter 5(5.20 to 5.23)
91- L85	Exercise Problems: Chapter 5(5.24 and 5.27)
92- L86	Exercise Problems: Chapter 5(5.30 to 5.35)
93- L87	Problems
94- L88	**Allotting portion for Internal Test-III**
	Internal Test III begins(15-09-2014)
95- L89	Revision
96- IT-III	**Internal Test-III**
97- L90	Revision
98- L91	Revision
99- L92	**Test Paper distribution and result analysis**
100- L93	Revision
	Entering Internal Test-III Marks into University portal
101- MT	**Model TestBegins (24-10-2014)**
102- MT	**Model Test**
103- MT	**Model Test**
104- L94	**Model test paper distribution and previous year university question paper discussion**
105- L-95	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-10-2014

Course Outcomes

Learning Outcomes	**COs** of the course “<Probability & Statistics>”
CO1	Gain the knowledge on probability distributions.
CO2	Gain knowledge on Concepts of Random Variables and Distributions.
CO3	Acquire knowledge on Basic Concepts of Expectation and continuous & discrete distribution.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Practical-Programming with C++ and M.S-Office C++
Course Code	**HMAE21**
Class	II year (2015-2016)
Semester	Even
Staff Name	Mr.Stalin Alexis
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To get the Knowledge to develop a C++ program for a given problem.

Syllabus

Text: Object Oriented Programming with CH (Fourth Edition), E. Balagurusamy-TMH Publications. Programming Exercises 5.2, 5.5,6.2 and 7.4, 7.3.7.5, 9.1 and 9.2. 10.3 and 11.1, 11.3 and 11.2.

Ms-Office

Features in word:
1. Creating a Document 2. Formatting a Document 3. Adding Headers and Footers 4. Table creation and Manipulation 5. Entering and editing Formulas and Symbols 6. Inserting a Graphics to a document 7. Mail Merge

Features in Excel:
1. Entering and Editing Formulas 2. Graphs and Charts 3. Simple calculations using Mathematical Statistical/ Logical functions 4. Cell formatting 5. Sorting 6. Inserting Images

Features in Power Point: 1. Creating a simple presentation 2. Adding Transition effects to a presentation 3. Adding Animation effects to a presentation 4. Adding sound effect to a presentation 5. Creating Hyperlinks between slides 6. Changing the background 7. Inserting Images

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 02-12-2015
1-L1	MS Office-Introduction
2-L2	**Features in word**
3- L3	Creating a Document
4-L4	Formatting a Document
5-L5	Formatting a Document
6-L6	Lab
7-L7	Adding Headers and Footers
8-L8	Adding Headers and Footers
9-L9	Table creation and Manipulation
10-P1	**Inauguration of Mathematics Association**
11-L10	Table creation and Manipulation
12-L11	Lab
13-L12	Entering and editing Formulas and Symbols
14-L13	Entering and editing Formulas and Symbols
15-L14	Lab
16-L15	Inserting a Graphics to a document
17-L16	Inserting a Graphics to a document
18-L17	Mail Merge
19-L18	Mail Merge
20-L19	Lab
21-L20	**Features in Excel**
22-L21	Entering and Editing Formulas
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins(25-01-2016)
24-L23	Entering and Editing Formulas
25-L24	Graphs and Charts
26-IT-1	**Internal Test-I**
27-L25	Graphs and Charts
28-L26	Lab
29-L27	Simple calculations using Mathematical Statistical/ Logical functions
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Simple calculations using Mathematical Statistical/ Logical functions
32- L30	Simple calculations using Mathematical Statistical/ Logical functions
33- L31	Simple calculations using Mathematical Statistical/ Logical functions
34-P2	**College level meeting/Cell function**
35- L32	Lab
36- L33	Cell formatting
37- L34	Cell formatting
38- L35	Sorting
39- L36	Sorting
40- L37	Inserting Images
41- L38	Inserting Images

42- L39	Lab
43- L40	**Features in Power Point**
44- L41	Creating a simple presentation
45- L42	Creating a simple presentation
46- L43	Lab
47- L44	Adding Transition effects to a presentation
48- L45	Adding Transition effects to a presentation
49- L46	Adding Transition effects to a presentation
50- L47	Lab
51- P3	**Department Seminar**
52- L48	Adding Animation effects to a presentation
53- L49	Adding Animation effects to a presentation
54- L50	Adding Animation effects to a presentation
55- L51	Lab
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(22-02-2016)
57-L53	Adding sound effect to a presentation
58-L54	Adding sound effect to a presentation
59-IT-II	**Internal Test-II**
60- L55	Lab
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Creating Hyperlinks between slides
63- L58	Creating Hyperlinks between slides
64- L59	Creating Hyperlinks between slides
65- L60	Lab
66- L61	Changing the background
67- L62	Changing the background
68- L63	Changing the background
69- L64	Lab
70- L65	Inserting Images
71- L66	Inserting Images
72- L67	Inserting Images
73- L68	Lab
74-P4	**College level meeting/ function**
75- L69	Lab
76- L70	Model Practical
77- L71	Model Practical
78- L72	Model Practical
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins(28-03-2016)
80- L74	Lab
81- L75	Lab
82-IT-III	**Internal Test-III**
83- L76	Lab
84- L77	**Test Paper distribution and result analysis**
85- L78	Lab
	Entering Internal Test-III Marks into University portal

86- L79	**Model Test Begins (11-04-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Practical-Programming with C++ and M.S-Office C++"
CO1	Enable the students to develop a C++ program for a given problem.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Partial Differential Equation
Course Code	**HMAE41**
Class	II year (2015-2016)
Semester	Even
Staff Name	Mr. J. Vijaya Xavier Parthiban
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Syllabus

Text Book: Elements Of Partial Differential Equations, IAN N. SNEDDON, McGraw Hill, New Delhi,1983.

Unit I: Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$ - 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)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 02.12.2015
1-L1	Introduction
2-L2	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
3- L3	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
4-L4	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
5-L5	Pfaffian Differential Forms and Equations
6-L6	Pfaffian Differential Forms and Equations
7-L7	Pfaffian Differential Forms and Equations
8- P1	**Inauguration of Mathematics Association**
9- L8	Solution of Pfaffian Differential Equations in three variables
10- L9	Solution of Pfaffian Differential Equations in three variables
11-L10	Solution of Pfaffian Differential Equations in three variables
12-L11	Solution of Pfaffian Differential Equations in three variables
13-L12	Partial Differential equations
14-L13	Partial Differential equations
15-L14	Partial Differential equations
16-L15	Origins of first order Partial Differential equations
17- L16	Origins of first order Partial Differential equations
18- L17	Origins of first order Partial Differential equations
19- L18	Linear equations of the first order
20- L19	Linear equations of the first order
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins(25-01-2016)
22- L21	Linear equations of the first order
23- IT-1	**Internal Test-I**
24- L22	Linear equations of the first order
25- L23	Integral surfaces passing through a given curve
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Integral surfaces passing through a given curve
28- L26	Integral surfaces passing through a given curve
29- L27	Integral surfaces passing through a given curve
30- P2	**College level meeting/Cell function**
31-L28	Cauchy's Method of Characteristics
32-L29	Cauchy's Method of Characteristics
33-L30	Cauchy's Method of Characteristics
34- L31	Cauchy's Method of Characteristics
35- L32	Compatible systems of First order Equations
36- L33	Compatible systems of First order Equations
37- L34	Compatible systems of First order Equations
38-L35	Compatible systems of First order Equations

39- L36	Charpit's Method
40- L37	Charpit's Method
41- L38	Charpit's Method
42-P3	**Department Seminar**
43- L39	Second order equations in Physics
44- L40	Second order equations in Physics
45- L41	Second order equations in Physics
46- L42	Linear Partial Differential equations with Constant Coefficients
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins(22-02-2016)
48- L44	Linear Partial Differential equations with Constant Coefficients
49-IT-II	**Internal Test-II**
50-L45	Characteristics of Equations in three variables
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Characteristics of Equations in three variables
53- L48	Characteristics of Equations in three variables
54- L49	Characteristics of Equations in three variables
55- L50	Problems
56- L51	Problems
57- L52	Problems
58- L53	Separation of variables
59-P4	**College level meeting/ function**
60- L54	Separation of variables
61- L55	Separation of variables
62- L56	Separation of variables
63- L57	Separation of variables
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins(28-03-2016)
65- L59	Problems
66- L60	Problems
67-IT-III	**Internal Test-III**
68- L61	Revision
69- L62	Revision
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test Begins (11-04-2016)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Partial Differential Equation"

CO1	Acquisition of knowledge about Pfaffian Differential Forms and Equations and their Solution in three variables.
CO2	Students will know about Origins of first order Partial Differential equations.
CO3	Knowledge gained about Cauchy's Method of Characteristics and Charpit's Method.
CO4	Learners will know about Second order equations in Physics, Linear Partial Differential equations with Constant Coefficients and Characteristics of Equations in three variables.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Algebra II
Course Code	**HMAM21**
Class	II year (2015-2016)
Semester	Even
Staff Name	Dr. Mrs. G.S. Grace Prema
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

Tex Book: Topics in Algebra, Second Edition, I.N.Herstein, Willey India Edition.

Unit 1: Algebra of linear transformations-characteristic roots. (Sections 6.1 and 6.2) Problems: Section 6.1(1 to 7, 10 to 13 and 17 to 21), Section 6.2(1 to 8)

Unit 2: Canonical forms: Triangular Forms-Nilpotent Transformations. (Sections 6.4 and 6.5) Problems: Section 6.4(1 to 6)

Unit 3: Trace and Transpose-Hermitian. Unitary and Normal transformations (Sections 6.8 and 6.10) Problems: Section 6.8(1 to 14). Section 6.10(1 to 12, 19 to 21)

Unit 4: Extension fields-roots of polynomials (Sections 5.1 and 5.3) Problems: Section 5.1(1 to 15) and Section 5.3(1 to 7)

Unit 5: More about roots-Finite fields. (Sections 5.5 and 7.1) Problems: Section 5.5(1 to 3) and Section 7.1(1 to 7)

Course Calendar

Hour allotment	**Class Schedule**

	Even Semester Begin on 02-12-2015
1-L1	Introduction
2-L2	Algebra of linear transformations
3- L3	Algebra of linear transformations
4-L4	Algebra of linear transformations
5-L5	Algebra of linear transformations
6-L6	characteristic roots
7-L7	characteristic roots
8-L8	characteristic roots
9-L9	characteristic roots
10-P1	**Inauguration of Mathematics Association**
11-L10	Problems: Section 6.1(1 to 3)
12-L11	Problems: Section 6.1(4 to 7)
13-L12	Problems: Section 6.1(10 to 13)
14-L13	Problems: Section 6.1(10 to 13)
15-L14	Problems: Section 6.1(17 to 21)
16-L15	Problems: Section 6.1(17to 21)
17-L16	Problems: Section 6.2(1 to 4)
18-L17	Problems: Section 6.2(5 to 8)
19-L18	Canonical forms
20-L19	Canonical forms
21-L20	Canonical forms
22-L21	Triangular Forms
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins(25-01-2016)
24-L23	Triangular Forms
25-L24	Triangular Forms
26-IT-1	**Internal Test-I**
27-L25	Nilpotent Transformations
28-L26	Nilpotent Transformations
29-L27	Nilpotent Transformations
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Problems: Section 6.4(1 to 3)
32- L30	Problems: Section 6.4(4 to 6)
33- L31	Trace and Transpose
34-P2	**College level meeting/Cell function**
35- L32	Trace and Transpose
36- L33	Trace and Transpose
37- L34	Trace and Transpose
38- L35	Hermitian
39- L36	Hermitian
40- L37	Hermitian
41- L38	Unitary and Normal transformations
42- L39	Unitary and Normal transformations
43- L40	Unitary and Normal transformations
44- L41	Problems: Section 6.8(1 to 4)
45- L42	Problems: Section 6.8(5 to 9)

46- L43	Problems: Section 6.8(10 to 14)
47- L44	Problems: Section 6.10(1 to 4)
48- L45	Problems: Section 6.10(5 to 8)
49- L46	Problems: Section 6.10(9 to 12)
50- L47	Problems: Section 6.10(19 to 21)
51- P3	**Department Seminar**
52- L48	Extension fields
53- L49	Extension fields
54- L50	roots of polynomials
55- L51	roots of polynomials
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(22-02-2016)
57-L53	Problems: Section 5.1(1 to 4)
58-L54	Problems: Section 5.1(5 to 9)
59-IT-II	**Internal Test-II**
60- L55	Problems: Section 5.1(10 to 13)
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems: Section 5.1(14 to 15)
63- L58	Problems: Section 5.3(1 to 4)
64- L59	Problems :Section 5.3(5 to 7)
65- L60	More about roots
66- L61	More about roots
67- L62	More about roots
68- L63	More about roots
69- L64	More about roots
70- L65	Finite fields
71- L66	Finite fields
72- L67	Finite fields
73- L68	Finite fields
74-P4	**College level meeting/ function**
75- L69	Finite fields
76- L70	Problems: Section 5.5(1 to 3)
77- L71	Problems: Section 7.1(1 to 4)
78- L72	Problems: Section 7.1(5 to 7)
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins(28-03-2016)
80- L74	Problems Discussion
81- L75	Problems Discussion
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (11-04-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper**

	discussion
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra II"
CO1	Knowledge gained about Ring Homomorphisms.
CO2	Acquisition of knowledge about Euclidean rings, Polynomial rings, Certain radicals of a ring, Jacobson radical of a ring and Semi simple ring.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis II
Course Code	**HMAM22**
Class	I year (2015-2016)
Semester	Even
Staff Name	Dr. Mrs. J. Suresh Suseela
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Define the real numbers, least upper bounds, and the triangle inequality.
- Define functions between sets; equivalent sets; finite, countable and uncountable sets. Recognize convergent, divergent, bounded, Cauchy and monotone sequences.
- Calculate the limit superior, limit inferior, and the limit of a sequence.

Syllabus

Text: Principles of Mathematical Analysis, Third Edition, Walter Rudin-Mcgraw-Hill International Book Company.

Unit 1: Definition and Properties of Integral-Integration and Differentiation. (Section 6.1 to 6.22) Exercise Problems: Chapter 6(1 to 6 and 10 to 14)

Unit 2: Integration of vector valued functions - Rectifiable ares, Sequence and series of functions: Discussion of main problem-Uniform ConvergenceUniform convergence and continuity. (Section 6.23 to 6.27 and 7.1 to 7.15) Exercise Problems: Chapter 6(15 to 17) and Chapter 7(1 to 9)

Unit 3: Uniform Convergence and Integration- Uniform Convergence and Differentiation- Equicontinuous families of functions-The Stone Weierstrass theorem. (Section 7.16 to 7.33) Exercise Problems: Chapter 7(20 to 24)

Unit 4: Power series-The exponential, logarithmic and trigonometrical functions (Section 8.1 to 8.7) Exercise Problems: Chapter 8(1 to 8)

Unit 5: The algebraic completeness of the complex field-Fourier series-The Gamma function (Section 8.8 to 8.22) Exercise Problems: Chapter 8(12 to 16)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 02-12-2015
1-L1	Introduction
2-L2	Definition and Properties of Integral
3- L3	Definition and Properties of Integral
4-L4	Definition and Properties of Integral
5-L5	Definition and Properties of Integral
6-L6	Integration and Differentiation
7-L7	Integration and Differentiation
8-L8	Integration and Differentiation
9-L9	Integration and Differentiation
10-P1	**Inauguration of Mathematics Association**
11-L10	Exercise Problems: Chapter 6(1 to 3)
12-L11	Exercise Problems: Chapter 6(4 to6)
13-L12	Exercise Problems: Chapter 6(10 to 14)
14-L13	Integration of vector valued functions
15-L14	Integration of vector valued functions
16-L15	Integration of vector valued functions
17-L16	Rectifiable ares
18-L17	Rectifiable ares
19-L18	Sequence and series of functions
20-L19	Sequence and series of functions
21-L20	Discussion of main problem
22-L21	Discussion of main problem
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins(25-01-2016)
24-L23	Uniform convergence and continuity
25-L24	Uniform convergence and continuity
26-IT-1	**Internal Test-I**
27-L25	Uniform convergence and continuity
28-L26	Exercise Problems: Chapter 6(15 to 17)
29-L27	Exercise Problems: Chapter 7(1 to 4)
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Exercise Problems: Chapter 7(5 to 9)
32- L30	Uniform Convergence and Integration
33- L31	Uniform Convergence and Integration
34-P2	**College level meeting/Cell function**

35- L32	Uniform Convergence and Differentiation
36- L33	Uniform Convergence and Differentiation
37- L34	Equicontinuous families of functions
38- L35	Equicontinuous families of functions
39- L36	Equicontinuous families of functions
40- L37	The Stone Weierstrass theorem
41- L38	The Stone Weierstrass theorem
42- L39	Exercise Problems: Chapter 7(20 to 24)
43- L40	Power series
44- L41	The exponential
45- L42	The exponential
46- L43	logarithmic and trigonometrical functions
47- L44	logarithmic and trigonometrical functions
48- L45	logarithmic and trigonometrical functions
49- L46	logarithmic and trigonometrical functions
50- L47	logarithmic and trigonometrical functions
51- P3	**Department Seminar**
52- L48	Exercise Problems: Chapter 8(1 to 4)
53- L49	Exercise Problems: Chapter 8(5 to 8)
54- L50	The algebraic completeness of the complex field
55- L51	The algebraic completeness of the complex field
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(22-02-2016)
57-L53	The algebraic completeness of the complex field
58-L54	The algebraic completeness of the complex field
59-IT-II	**Internal Test-II**
60- L55	The algebraic completeness of the complex field
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Fourier series
63- L58	Fourier series
64- L59	Fourier series
65- L60	Fourier series
66- L61	Fourier series
67- L62	The Gamma function
68- L63	The Gamma function
69- L64	The Gamma function
70- L65	The Gamma function
71- L66	The Gamma function
72- L67	Exercise Problems: Chapter 8(12 to 14)
73- L68	Exercise Problems: Chapter 8(15,16)
74-P4	**College level meeting/ function**
75- L69	Problems
76- L70	Problems
77- L71	Problems
78- L72	Problems
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins(28-03-2016)

80- L74	Problem Discussion
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (11-04-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Analysis II"
CO1	Knowledge gained about Integration of vector valued functions.
CO2	Knowledge gained about The Stone Weierstrass Theorem, Fourier Series and The Gamma function.
CO3	Acquisition of knowledge about Uniform Convergence, Uniform Convergence and Continuity, Uniform Convergence and Integration, Uniform Convergence and Differentiation.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Classical Mechanics
Course Code	**HMAM23**
Class	II year (2015-2016)
Semester	Even
Staff Name	Mrs. T. Santhakumari
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To study mechanical systems under generalized coordinate systems, virtual work, energy and momentum
- To study mechanics developed by Newton, Langrange, Hamilton and Jacobi

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begins on 02-12-2015
1-L1	Unit I – Introduction: Mechanics of a single particle
2-L2	Conservation theorem for linear momentum of a single particle
3- L3	Conservation theorem for angular momentum of a single particle
4-L4	Some remarks on conservation theorems
5-L5	Energy conservation theorem
6-L6	Problem discussion on mechanics of a single particle
7-L7	Mechanics of a system of particles
8- P1	**Inauguration of Mathematics Association**
9- L8	Conservation theorem for linear momentum of a system of particles
10- L9	Conservation theorem for angular momentum of a system of particles
11-L10	Theorems on Kinetic energy
12-L11	Problem discussion on Kinetic energy
13-L12	Energy conservation theorem
14-L13	Exercise problems using conservation theorem
15-L14	Unit II – Constraints: Different types of constraints
16-L15	Examples for holonomic constraints and non-holonomic constraints
17- L16	Virtual work and D'Alembert's Principle
18- L17	Lagrange's equation from D'Alembert's Principle – Theorem
19- L18	Lagrange's equation for non-holonomic constraints
20- L19	Velocity dependent potentials
21- L20	Rayleigh Dissipation function –**Allotting portion for Internal Test-I**

	Internal Test I begins (25-01-2016)
22- L21	Lagrangian for charged particle and some problems
23- IT-1	**Internal Test-I**
24- L22	Applications of the Lagrangian equation
25- L23	Lagrangian for a single particle (i) in cartesian coordinates (ii) in polar coordinates
26- L24	Lagrangian for Atwood machine - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Time dependent potential
28- L26	Problem - bead sliding on rotating wire and some exercise problems
29- L27	Unit III – Variation principles and lagrange's equation - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Hamilton's principle
32-L29	Stationary values
33-L30	Path of a system – congugration
34- L31	Path of a system – congugration
35- L32	Techniques of calculus of variation - theorem
36- L33	Lagrange's equation from Hamilton's principle
37- L34	Shortest distance between two point in a space
38- L35	Minimum surface of revolution
39- L36	Brachistochrone problem
40- L37	Extension of Hanilton's Principle
41- L38	Extension of Hanilton's Principle non-holonomic system
42-P3	**Department Seminar**
43- L39	Unit IV –Two body central force problem
44- L40	Reduction to one body problem
45- L41	The equations of motion and first integral theorem
46- L42	The Kepler's Second law of planetary motion
47- L43	Derivatives - **Allotting portion for Internal Test-II**
	Internal Test II begins (22-02-2016)
48- L44	Illustrations about derivative and motion
49-IT-II	**Internal Test-II**
50-L45	The equivalent one dimensional problems
51- L46	Classification of orbits - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Examples of the method occurs for a linear restoring force
53- L48	Inverse square law for circular orbits
54- L49	The virial theorem.
55- L50	Problem discussion based on the virial's theorem
56- L51	Unit V – The differential equation for the orbit
57- L52	Problems on differential equation for the orbit
58- L53	Integrable power-law potentials

59-P4	**College level meeting/ function**
60- L54	The Kepler problem
61- L55	Inverse square law of force
62- L56	Nature of the orbit depends on *e* and *E*
63- L57	The motion in time in the Kepler problem
64- L58	Deriving the approximate version of the Kepler's third law – **Allotting portion for Internal Test-III**
	Internal Test III begins (28-03-2016)
65- L59	Existence of conserved vector **A** for the Kepler problem
66- L60	The Laplace-Runge-Lenz vector
67-IT-III	**Internal Test-III**
68- L61	Problem discussion
69- L62	Scattering in a central force field
70- L63	Relation of orbit parameters and scattering angle - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 11-04-2016
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22.04.2016

Course Outcomes

Learning Outcomes	**COs** of the course "Classical Mechanics"
CO1	Able to understand D' Alembert's Principle and simple applications of the Lagrangian Formulation.
CO2	Able to analyze the Derivation of Lagrange's Equations from Hamilton's Principle and Extension of Hamilton's Principle to Non-holonomic Systems
CO3	Able to study the concept of the Equations of Motion and the Equivalent One-Dimensional Problems.
CO4	Able to understand the Kepler Problem and Inverse-Square Law of Force.
CO5	Able to distinguish the concept of the Hamilton Equations of Motion and the Principle of Least Action.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Ordinry Differential Equation
Course Code	**HMAM24**
Class	I year (2015-2016)
Semester	Even
Staff Name	Dr. Mr. A. Alwyn Asir
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 2-12-2015
1-L1	Introduction
2-L2	Second Order linear equations
3- L3	General solution of the Homogeneous equations
4-L4	General solution of the Homogeneous equations
5-L5	General solution of the Homogeneous equations
6-L6	The use of a known solution to find another
7-L7	The use of a known solution to find another
8-L8	The use of a known solution to find another
9-L9	The method of variation of parameters
10-P1	**Inauguration of Mathematics Association**
11-L10	The method of variation of parameters
12-L11	The method of variation of parameters
13-L12	The method of variation of parameters
14-L13	Power series solutions
15-L14	Power series solutions
16-L15	A review of power series solutions
17-L16	A review of power series solutions
18-L17	A review of power series solutions
19-L18	Series solution of first order equations
20-L19	Series solution of first order equations
21-L20	Series solution of first order equations
22-L21	Series solution of first order equations
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins(25-01-2016)
24-L23	Second order equations
25-L24	Second order equations
26-IT-1	**Internal Test-I**
27-L25	Second order equations
28-L26	Ordinary points
29-L27	Ordinary points
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Ordinary points
32- L30	Regular singular points
33- L31	Regular singular points
34-P2	**College level meeting/Cell function**

35- L32	Regular singular points
36- L33	Regular singular points
37- L34	Legendre polynomials
38- L35	Legendre polynomials
39- L36	Legendre polynomials
40- L37	Properties of Legendre Polynomials
41- L38	Properties of Legendre Polynomials
42- L39	Properties of Legendre Polynomials
43- L40	Bessel functions
44- L41	Bessel functions
45- L42	Bessel functions
46- L43	Bessel functions
47- L44	The Gamma functions
48- L45	The Gamma functions
49- L46	The Gamma functions
50- L47	The Gamma functions
51- P3	**Department Seminar**
52- L48	Properties of Bessel functions
53- L49	Properties of Bessel functions
54- L50	Properties of Bessel functions
55- L51	Properties of Bessel functions
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(22-02-2016)
57-L53	Linear systems
58-L54	Linear systems
59-IT-II	**Internal Test-II**
60- L55	Linear systems
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Linear systems
63- L58	Linear systems
64- L59	Problems
65- L60	Problems
66- L61	Problems
67- L62	Problems
68- L63	Homogeneous linear systems with constant coefficients
69- L64	Homogeneous linear systems with constant coefficients
70- L65	Homogeneous linear systems with constant coefficients
71- L66	Homogeneous linear systems with constant coefficients
72- L67	Homogeneous linear systems with constant coefficients
73- L68	Homogeneous linear systems with constant coefficients
74-P4	**College level meeting/ function**
75- L69	Homogeneous linear systems with constant coefficients
76- L70	Homogeneous linear systems with constant coefficients
77- L71	Homogeneous linear systems with constant coefficients
78- L72	Problem discussion
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins(28-03-2016)

80- L74	Problem discussion
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test Begins (11-04-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Ordinary Differential Equation''
CO1	Knowledge gained about Second Order linear equations and Power series solutions.
CO2	Acquisition of knowledge about Legendre polynomials, Bessel functions, The Gamma functions and Linear systems.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Functional Analysis
Course Code	**HMAM41**
Class	II year (2015-2016)
Semester	Even
Staff Name	Dr. Mrs. Suresh Suseela
Credits	5
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Course Objectives

- To gain knowledge about Banach Spaces, Hilbert Spaces and Banach Algebra.
- To use algebraic structure in Analysis.

Syllabus

Text Book: Introduction to Topology and Modern Analysis-G.F.SimmonsMcGraw-Hill International Editions.

Unit 1: Banach Spaces-The Definition and some examples-Continuous linear transformations-The Hahn-Banach Theorem-The Natural imbedding of N in N**

(Chapter 9: Section 46 to 49)

Problems: Section 46(1 to 4), Section 47(1 to 7), Section 48(1 to 4) and Section 49(1 to 3)

Unit 2: The open mapping theorem-The conjugate of an operator, Hilbert Spaces-The Definition and some simple properties-Orthogonal Complements

(Chapter 9: Sections 50, 51 and Chapter 10: Sections 52, 53)

Problems: Section 50(1 to 3), Section 51(1 to 3), Section 52(1,3,4 and 6) and Section 53(1 to 4)

Unit 3: Orthonormal Sets-The Conjugate Space H*-The Adjoint of an Operator-SelfAdjointOpertators.

(Chapter 10: Sections 54 to 57)

Problems: Section 54(1 to 5), Section 55(1 to 3), Section 56(1 to 4) and Section 57(1and 2)

Unit 4: Normal and Unitary Operators Projections, Finite Dimensional Spectral Theory-Determinants and the Spectrum of an Operator The Spectral Theorem

(Chapter 10: Sections 58, 59 and Chapter 11: Sections 61 and 62)

Problems: Section 58(1 to 4). Section 59(1 to 4), Section 611and 2) and Section 62(1 to 5)

Unit 5. General Preliminaries on Banach Algebras- The Definition and Some examples-Regular and singular elements-Topological divisors of zero-The SpectrumThe formula for the Spectral radius-The Radical and Semi-simplicity

(Chapter 12: Sections 64 to 69) (No Problems)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 02.12.2015
1-L1	Introduction
2-L2	Banach Spaces Definition
3- L3	Banach Spaces examples
4-L4	Banach Spaces examples
5-L5	Banach Spaces examples
6-L6	Continuous linear transformations
7-L7	Continuous linear transformations
8-L8	Continuous linear transformations
9-L9	Continuous linear transformations
10-L10	Continuous linear transformations
11-L11	Continuous linear transformations
12-L12	The Hahn-Banach Theorem
13-L13	The Hahn-Banach Theorem
14-L14	The Hahn-Banach Theorem
15-L15	The Hahn-Banach Theorem
16-P1	**Inauguration of MathematicsAssociation**
17-L16	The Hahn-Banach Theorem
18-L17	The Natural imbedding of N in N**
19-L18	The Natural imbedding of N in N**
20-L19	The Natural imbedding of N in N**
21-L20	The Natural imbedding of N in N**
22-L21	Exercise Problems
23-L22	Exercise Problems
24-L23	Exercise Problems
25-L24	The open mapping theorem

26-L25	The open mapping theorem
27-L26	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(25.01.2016)
28-L27	The open mapping theorem
29-L28	The open mapping theorem
30- IT-1	**Internal Test-I**
31- L29	The conjugate of an operator
32-L30	The conjugate of an operator
33- L31	The conjugate of an operator
34- L32	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
35- L33	Hilbert Spaces-The Definition
36- L34	Hilbert Spaces- simple properties
37- L35	Hilbert Spaces- simple properties
38- P2	**College level meeting/Cell function**
39- L36	Hilbert Spaces- simple properties
40- L37	Hilbert Spaces- simple properties
41- L38	Orthogonal Complements
42- L39	Orthogonal Complements
43- L40	Orthogonal Complements
44- L41	Orthogonal Complements
45- L42	Orthonormal Sets
46- L43	Orthonormal Sets
47- L44	Orthonormal Sets
48- L45	Orthonormal Sets
49- L46	Orthonormal Sets
50- L47	Conjugate Space H*
51- L48	Conjugate Space H*
52- L49	Conjugate Space H*
53- P3	**Department Seminar**
54- L50	Conjugate Space H*
55- L51	The Adjoint of an Operator
56-L52	The Adjoint of an Operator
57-L53	The Adjoint of an Operator
58-L54	The Adjoint of an Operator
59- 55L	SelfAdjointOpertators
60- L56	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(22.02.2016)
61- L57	SelfAdjointOpertators
62- L58	SelfAdjointOpertators
63- IT-II	**Internal Test-II**
64- L59	Exercise Problems
65- L60	**Test Paper distribution and result analysis**
66- L61	**Entering Internal Test-II Marks into University portal**
67- L62	Exercise Problems
68- L63	Exercise Problems
69- L64	Exercise Problems
70- L65	Normal and Unitary Operators Projections

71- L66	Normal and Unitary Operators Projections
72- L67	Normal and Unitary Operators Projections
73- L68	Normal and Unitary Operators Projections
74- L69	Finite Dimensional Spectral Theory
75- L70	Finite Dimensional Spectral Theory
76- L71	Finite Dimensional Spectral Theory
77- L72	Finite Dimensional Spectral Theory
78- L73	Finite Dimensional Spectral Theory
79-L74	Determinants and the Spectrum of an Operator The Spectral Theorem
80-L75	Determinants and the Spectrum of an Operator The Spectral Theorem
81-L76	Determinants and the Spectrum of an Operator The Spectral Theorem
82-L77	Determinants and the Spectrum of an Operator The Spectral Theorem
83-L78	Exercise Problems
84-L79	Exercise Problems
85-L80	Exercise Problems
86-L81	General Preliminaries on Banach Algebras Definition
87-L82	General Preliminaries on Banach AlgebrasDefinition
88- P4	**College level meeting/ function**
89-L83	General Preliminaries on Banach Algebras Examples
90-L84	General Preliminaries on Banach Algebras Examples
91-L85	General Preliminaries on Banach Algebras Examples
92-L86	Regular and singular elements
93-L87	Regular and singular elements
94-L88	Regular and singular elements
95-L89	Regular and singular elements
96-L90	Topological divisors of zero
97-L91	Topological divisors of zero
98-L92	Topological divisors of zero
99-L93	Topological divisors of zero
100-L94	The Spectrum The formula for the Spectral radius
101-L95	The Spectrum The formula for the Spectral radius
102-L96	The Spectrum The formula for the Spectral radius
103-L97	The Spectrum The formula for the Spectral radius
104-L98	The Radical and Semi
105-L99	The Radical and Semi
106-L100	The Radical and Semi
107-L101	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(28.03.2016)
108-L102	The Radical and Semi
109- L103	The Radical and Semi
110-IT-III	**Internal Test-III**
111- L104	Revision
112- L105	**Test Paper distribution and result analysis**
113- L106	Revision
114- L107	**Entering Internal Test-III Marks into University portal**
115- L108	**Model Test (11.04.2016)**
116-MT	**Model Test**
117-MT	**Model Test**

118-MT	**Model test paper distribution and previous year university question paper discussion**
119-L109	**Feedback of the Course, analysis and report preparation**
120-L110	**Last Working day on 22.04.2016**

Course Outcomes

Learning Outcomes	**COs** of the course "Functional Analysis"
CO1	To gain knowledge about Banach Spaces, Hilbert Spaces and Banach Algebra.
CO2	To use algebraic structure in Analysis.
CO3	Graduates will have a strong foundations and in depth understanding of the current topics related with functional Analysis, Spectral Theory, Approximation Theory.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Measure & Integration
Course Code	**HMAM42**
Class	II year (2015-2016)
Semester	Even
Staff Name	Mrs. W. Rajammal Ranjitha Mary
Credits	8
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Course Objectives

- Basic knowledge of differentiation, integration and continuity of real functions.

Syllabus

Text: Real Analysis, Fourth Edition, H.L Royden, P.M.Fitzpatrick, PHI Learning Private Limited

Unit 1. Lebesgue Measure-Lebesgue outer measure-The c-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 (Sections 2.1 to 2.5 and 3.1) (Problems: Chapter 2: 1 to 12, 16 to 18 and Chapter 3: 1 to 6)

Unit 2: Sequential Pointwise Limits and Simple Approximation Littlewood's Three Principles, Egoroff's Theorem and Lusins 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 nonnegative function- the general Lebesgue integral-Countable Additivity and continuity of Integration, (Sections 3.2, 3,3 and 4.1 to 4.5) (Chapter 4: Problems 9 to 12, 16 to 20, 28 and 30)

Unit 3: Differentiation and Integration-Continuity of monotone functions-differentiability of monotone function: Lebesgue Theorem-Functions of pounded variations: Jordan's Theorem-Absolutely continuous functions-Integrating Derivatives: Differentiating Indefinite Integrals-Convex functions (Sections 6.1 to 6.6)(No Problems)

Unit 4: Measure and Integration - Measures and Measurable sets-Signed Measures: The Hahn and Jordan Decompositions-The Carathéodory Measure induced by an outer Measure. The construction of outer MeasureThe Carathéodory-Hahn Theorem: The extension of a Premeasure to a Measure. (Sections 17.1 to 17.5) (Chapter 17: Problems 1, 2, 5, 13, 14, 18 and 19)

Unit 5: Integration over general Measure spaces: Measurable FunctionsIntegration of Nonnegative Measurable Functions Integration of general Measurable functions-The Radon-Nikodym Theorem.19-3 (Sections 18.1 to 18:4) (Chapter 18: Problems 1, 2, 4,5, 6, 18, 19, 21, 28, 29, 31, 32, 33, 49 and17.4 50)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 2-12-2015
1-L1	Unit-I Introduction
2-L2	Lebesgue Measure
3- L3	Lebesgue outer measure
4-L4	The c-Algebra of Lebesgue Measurable sets
5-L5	Outer and Inner Approximation of Lebesgue Measurable sets
6-L6	Outer and Inner Approximation of Lebesgue Measurable sets
7-L7	Countable Additivity
8-L8	Continuity
9-L9	Borel-Cantelli Lemma
10-L10	Lebesgue Measurable functions
11-L11	Sums, Products
12-L12	Compositions
13-L13	Problems: Chapter 2: 1 to 6
14-L14	Problems: Chapter 2: 6 to 12
15-L15	Problems: Chapter 3: 1 to 6
16-P1	**Inauguration of MathematicsAssociation**
17-L16	Unit-II Introduction
18-L17	Sequential Pointwise Limits
19-L18	Simple Approximation
20-L19	Simple Approximation
21-L20	Littlewood's Three Principles
22-L21	Littlewood's Three Principles
23-L22	Littlewood's Three Principles
24-L23	Egoroff's Theorem
25-L24	Lusins Theorem
26-L25	Lebesgue Integration
27-L26	The Riemann Integral
28-L27	The Riemann Integral
29-L28	**Allotting portion for Internal Test-I**
	Internal Test I begins(25-01-2016)
30-L29	The Lebesgue Integral of a bounded measurable function over a set of finite measure

31- L30	The Lebesgue integral of a measurable nonnegative function
32- IT-1	**Internal Test-I**
33- L31	the general Lebesgue integral
34- L32	Countable Additivity
35- L33	continuity of Integration
36- L34	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
37- L35	Problems: Chapter 4(9 to 12)
38- L36	Problems: Chapter 4(16 to 20)
39- L37	Problems: Chapter 4(28 to 30)
40- P2	**College level meeting/Cell function**
41- L38	Unit-III Introduction
42- L39	Differentiation
43- L40	Integration
44- L41	Continuity of monotone functions
45- L42	Continuity of monotone functions
46- L43	differentiability of monotone function
47- L44	Lebesgue Theorem
48- L45	Functions of bounded variations
49- L46	Functions of bounded variations
50- L47	Jordan's Theorem
51- L48	Absolutely continuous functions
52- L49	Absolutely continuous functions
53- L50	Integrating Derivatives
54- L51	Differentiating Indefinite Integrals
55- P3	**Department Seminar**
56-L52	Differentiating Indefinite Integrals
57-L53	Convex functions
58-L54	Convex functions
59- 55L	Unit-IV Introduction
60- L56	Measure and Integration
61- L57	Measure and Integration
62- L58	**Allotting portion for Internal Test-II**
	Internal Test II begins(22-02-2016)
63- L59	Measures and Measurable sets
64- L60	Measures and Measurable sets
65- IT-II	**Internal Test-II**
66- L61	Signed Measures
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Signed Measures
69- L64	The Hahn and Jordan Decompositions
70- L65	The Hahn and Jordan Decompositions
71- L66	The Hahn and Jordan Decompositions
72- L67	The Carathéodory Measure induced by an outer Measure
73- L68	The Carathéodory Measure induced by an outer Measure
74- L69	The Carathéodory Measure induced by an outer Measure
75- L70	The construction of outer Measure

76- L71	The construction of outer Measure
77- L72	The construction of outer Measure
78- L73	The Carathéodory-Hahn Theorem
79-L74	The Carathéodory-Hahn Theorem
80-L75	The extension of a Premeasure to a Measure
81-L76	The extension of a Premeasure to a Measure
82-L77	The extension of a Premeasure to a Measure
83-L78	Problems 1, 2, 5
84-L79	Problems 13, 14
85-L80	Problems 18, 19
86-L81	Unit-V Introduction
87-L82	Integration over general Measure spaces
88-L83	Integration over general Measure spaces
89-L84	Integration over general Measure spaces
90-P4	**College level meeting/ function**
91-L85	Integration over general Measure spaces
92-L86	Measurable Functions
93-L87	Measurable Functions
94-L88	Measurable Functions
95-L89	Measurable Functions
96-L90	Integration of Nonnegative Measurable Functions Integration of general Measurable functions
97-L91	Integration of Nonnegative Measurable Functions Integration of general Measurable functions
98-L92	The Radon-Nikodym Theorem
99-L93	The Radon-Nikodym Theorem
100-L94	Problems 1, 2
101-L95	Problems 4, 5
102-L96	Problems 6, 18
103-L97	Problems 19, 21
104-L98	Problems 28, 29
105-L99	Problems 31, 32
106-L100	Problems 33, 49
107-L101	Problems 50
108-L102	Revision
109- L103	**Allotting portion for Internal Test-III**
	Internal Test III begins(28-03-2016)
110- L104	Revision
111- L105	Revision
112-IT-III	**Internal Test-III**
113- L106	Revision
114- L107	**Test Paper distribution and result analysis**
115- L108	Revision
	Entering Internal Test-III Marks into University portal
116-MT	**Model Test Begins (11-04-2016)**
117-MT	**Model Test**
118-MT	**Model Test**
119-L109	**Model test paper distribution and previous year university question paper**

	discussion
120-L110	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Measure & Integration"
CO1	Understanding the concept of lesbeague measure, lesbeague integration and signed measure.
CO2	To provide the understanding of general measure spaces.
CO3	Basic knowledge of differentiation, integration and continuity of real functions.
CO4	Knowledge gained about lesbeague theory and general measure spaces and their properties and construction
CO5	Gain the knowledge of measure spaces and measure interruption.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analytic Number Theory
Course Code	**HMAM43**
Class	II year (2015-2016)
Semester	Even
Staff Name	Dr. Mr. G. Jeyakumar
Credits	5
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Course Objectives

- Define and interpret the concepts of divisibility, congruence, greatest common divisor, prime, and prime-factorization.
- Apply the Law of Quadratic Reciprocity and other methods to classify numbers as primitive roots, quadratic residues, and quadratic non-residues.

Syllabus

Text: Introduction to Analytic Number Theory-Tom M.Apostol-Springer International Student Edition

Unit 1: The fundamental theorem of Arithmetic (Chapter 1 and Exercise problems 1 to 30)

Unit 2: Arithmetic functions.(Sections 2.1 to 2.9 and Exercise problems: Chapter 2(1 to 20))

216

Unit 3: Multiplicative functions and Dirichlet Multiplication. (Sections 2.10 to 2.15 and Exercise problems : Chapter 2 (21 to 35))

Unit 4: Averages of Arithmetical functions. (Chapter 3 and Exercise problems: Chapter 3 (1 to 12))

Unit 5: Chebyshev's functions-equivalent forms of prime number theorem-Shapiro's theorem and its applications. (Sections 4.1 to 4.7 and Exercise problems: Chapter 41 to 11)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 02-12-2015
1-L1	Introduction
2-L2	The fundamental theorem of Arithmetic
3- L3	The fundamental theorem of Arithmetic
4-L4	The fundamental theorem of Arithmetic
5-L5	Exercise problems 1 to 4
6-L6	Exercise problems 5 to 10
7-L7	Exercise problems 11 to 15
8-L8	Exercise problems 16 to 20
9-L9	Exercise problems 21 to 25
10-L10	Exercise problems 26 to 30
11-L11	Arithmetic functions
12-L12	Arithmetic functions
13-L13	Arithmetic functions
14-L14	Arithmetic functions
15-L15	Arithmetic functions
16-P1	**Inauguration of Mathematics Association**
17-L16	Exercise problems: Chapter 2(1 to 4)
18-L17	Exercise problems: Chapter 2(5 to 9)
19-L18	Exercise problems: Chapter 2(10 to 14)
20-L19	Exercise problems: Chapter 2(15 to 19)
21-L20	Exercise problems: Chapter 2(20)
22-L21	Multiplicative functions
23-L22	Multiplicative functions
24-L23	Multiplicative functions
25-L24	Multiplicative functions
26-L25	Multiplicative functions
27-L26	Multiplicative functions
28-L27	Dirichlet Multiplication
29-L28	**Allotting portion for Internal Test-I**
	Internal Test I begins(25-01-2016)
30-L29	Dirichlet Multiplication
31- L30	Dirichlet Multiplication
32-IT-1	**Internal Test-I**
33- L31	Dirichlet Multiplication
34- L32	Dirichlet Multiplication
35- L33	Dirichlet Multiplication
36- L34	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
37- L35	Exercise problems : Chapter 2 (21 to 23)
38- L36	Exercise problems : Chapter 2 (24 to 26)
39- L37	Exercise problems : Chapter 2 (27 to 29)
40- P2	**College level meeting/Cell function**
41- L38	Exercise problems : Chapter 2 (30 to 32)
42- L39	Exercise problems : Chapter 2 (33 to 35)

43- L40	Averages of Arithmetical functions
44- L41	Averages of Arithmetical functions
45- L42	Averages of Arithmetical functions
46- L43	Averages of Arithmetical functions
47- L44	Averages of Arithmetical functions
48- L45	Averages of Arithmetical functions
49- L46	Averages of Arithmetical functions
50- L47	Averages of Arithmetical functions
51- L48	Averages of Arithmetical functions
52- L49	Averages of Arithmetical functions
53- L50	Averages of Arithmetical functions
54- L51	Averages of Arithmetical functions
55- P3	**Department Seminar**
56-L52	Exercise problems: Chapter 3 (1 to 3)
57-L53	Exercise problems: Chapter 3 (4 to 6)
58-L54	Exercise problems: Chapter 3 (7 to 9)
59- 55L	Exercise problems: Chapter 3 (10 to 12)
60- L56	Chebyshev's functions
61- L57	Chebyshev's functions
62- L58	**Allotting portion for Internal Test-II**
	Internal Test II begins(22-02-2016)
63- L59	Chebyshev's functions
64- L60	Chebyshev's functions
65- IT-II	**Internal Test-II**
66- L61	Chebyshev's functions
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Chebyshev's functions
69- L64	Chebyshev's functions
70- L65	Chebyshev's functions
71- L66	equivalent forms of prime number theorem
72- L67	equivalent forms of prime number theorem
73- L68	equivalent forms of prime number theorem
74- L69	equivalent forms of prime number theorem
75- L70	equivalent forms of prime number theorem
76- L71	equivalent forms of prime number theorem
77- L72	equivalent forms of prime number theorem
78- L73	equivalent forms of prime number theorem
79-L74	Shapiro's theorem and its applications
80-L75	Shapiro's theorem and its applications
81-L76	Shapiro's theorem and its applications
82-L77	Shapiro's theorem and its applications
83-L78	Shapiro's theorem and its applications
84-L79	Shapiro's theorem and its applications
85-L80	Shapiro's theorem and its applications
86-L81	Shapiro's theorem and its applications
87-L82	Shapiro's theorem and its applications
88-L83	Shapiro's theorem and its applications

89-L84	Shapiro's theorem and its applications
90-P4	**College level meeting/ function**
91-L85	Exercise problems: Chapter 4(1)
92-L86	Exercise problems: Chapter 4(2)
93-L87	Exercise problems: Chapter 4(3)
94-L88	Exercise problems: Chapter 4(4)
95-L89	Exercise problems: Chapter 4(5)
96-L90	Exercise problems: Chapter 4(6)
97-L91	Exercise problems: Chapter 4(7)
98-L92	Exercise problems: Chapter 4(8)
99-L93	Exercise problems: Chapter 4(9)
100-L94	Exercise problems: Chapter 4(10)
101-L95	Exercise problems: Chapter 4(11)
102-L96	Problems
103-L97	Problems
104-L98	Problems
105-L99	Problems
106-L100	Problems
107-L101	Problems
108-L102	Problems
109- L103	**Allotting portion for Internal Test-III**
	Internal Test III begins(28-03-2016)
110- L104	Revision
111- L105	Revision
112-IT-III	**Internal Test-III**
113- L106	Revision
114- L107	**Test Paper distribution and result analysis**
115- L108	Revision
	Entering Internal Test-III Marks into University portal
116-MT	**Model Test Begins (11-04-2016)**
117-MT	**Model Test**
118-MT	**Model Test**
119-L109	**Model test paper distribution and previous year university question paper discussion**
120-L110	**Feedback of the Course, analysis and report preparation**
	Last Working day on 22-04-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Analytic Number Theory"
CO1	Knowledge gained about the fundamental Theorem of Arithmetic
CO2	Acquisition of knowledge about Arithmetic functions, Multiplicative functions and Dirichlet Multiplication.

CO3	Students will gain knowledge about Averages of Arithmetical functions, Partial sums of Dirichlet product and Chebyshev's functions .

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Programming with C++
Course Code	**HMAE11**
Class	I year (2015-2016)
Semester	Odd
Staff Name	Mr. K. Stalin Alexis
Credits	5
L. Hours /P. Hours	7 / WK
Total 105Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 95 Hrs (5 units; 5×19=95; 19Hrs /unit)	

Course Objectives

- To develop programming skills using the fundamentals and basics of C language.
- To study the advantages of user defined data type that provides flexibility for application development.
- To enable effective usage of arrays, structures, functions and pointers.
- Derive appropriate numerical methods to solve algebraic and transcendental equations.
- Derive appropriate numerical methods to solve a linear system of equations.
- Prove results for various numerical root finding methods

Syllabus

Text: Object Oriented Programming with C++(Fourth Edition), E.Balagurusamy-TMH Publications.

mming with C++

Unit 1: Beginning with CH, Tokens. Expressions and Control structures. (Chapter 2 and 3, including Debugging and Program exercises)

Unit 2: Functions in C++, Classes and objects. (Chapter 4 and 5. including Debugging and Program exercises)

Unit 3: Constructors and Destructors-Operator Over loading-Type Conversions. (Chapter 6 and 7, including Debugging and Program exercises)

Unit 4: Inheritance-Extending Classes-Pointers- Virtual Functions-Polymorphisms, Chapter 8 and 9, including Debugging and Program exercises)

Unit 5: Managing console I/O operations-Working with files. (Chapter 10 and 11, including Debugging and Program exercises)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2015
1-L1	Unit-I Introduction
2-L2	Beginning with C+
3- L3	Beginning with C+
4-L4	Beginning with C+
5-L5	Lab
6-L6	Tokens
7-L7	Tokens
8-L8	Tokens
9-L9	Lab
10-L10	Expressions
11-L11	Expressions
12-L12	Expressions
13-P1	**Welcoming of First year and Inauguration of Mathematics Association**
14-L13	Lab
15-L14	Control structures
16-L15	Control structures
17-L16	Control structures
18-L17	Lab
19-L18	Lab
20-L19	Unit-II Introduction
21-L20	Functions in C++
22-L21	Functions in C++
23-L22	Functions in C++
24-L23	Lab
25-L24	**Allotting portion for Internal Test-I**
	Internal Test I begins(20-07-2015)
26-L25	Classes
27-L26	Classes
28-IT-1	**Internal Test-I**
29-L27	Classes
30-L28	Lab

31- L29	objects
32- L30	objects
33- L31	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
34- L32	Objects
35- L33	Lab
36- L33	Lab
37- L35	Unit-III Introduction
38- L36	Constructors
39- L37	Constructors
40-P2	**College level meeting/Cell function**
41- L38	Constructors
42- L39	Lab
43- L40	Destructors
44- L41	Destructors
45- L42	Destructors
46- L43	Lab
47- L44	Operator Over loading
48- L45	Operator Over loading
49- L46	Operator Over loading
50- L47	Lab
51- L48	Type Conversions
52- L49	Type Conversions
53- L50	Type Conversions
54- P3	**Department Seminar**
55- L51	Lab
56- L52	Lab
57- L53	Unit-IV Introduction
58- L54	**Allotting portion for Internal Test-II**
59- L55	**Internal Test II begins(31-08-2015)**
60- L56	Inheritance
61- L57	Inheritance
62- IT-II	**Internal Test-II**
63- L58	Inheritance
64- L59	Lab
65- L60	Extending Classes
66- L61	Extending Classes
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Extending Classes
69- L64	Lab
70- L65	Pointers
71- L66	Pointers
72- L67	Pointers
73- L68	Lab
74- L69	Virtual Functions
75- L70	Virtual Functions
76- L71	Virtual Functions

77- L72	Lab
78- L73	Polymorphisms
79- L74	Polymorphisms
80- L75	Polymorphisms
81- L76	Lab
82- P4	**College level meeting/ function**
83- L77	Lab
84- L78	Unit-V Introduction
85- L79	Managing console I/O operations
86- L80	Managing console I/O operations
87- L81	Managing console I/O operations
88- L82	Lab
89- L83	Working with files
90- L84	Working with files
91- L85	Working with files
92- L86	Lab
93- L87	Lab
94- L88	**Allotting portion for Internal Test-III**
	Internal Test III begins(5-10-2015)
95- L89	Lab
96- IT-III	**Internal Test-III**
97- L90	Lab
98- L91	Lab
99- L92	**Test Paper distribution and result analysis**
100- L93	Revision
	Entering Internal Test-III Marks into University portal
101- MT	**Model Test (16-10-2015)**
102- MT	**Model Test**
103- MT	**Model Test**
104- L94	**Model test paper distribution and previous year university question paper discussion**
105- L-95	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29-10-2015

Course Outcomes

Learning Outcomes	**COs** of the course "Programming with C++"
CO1	Read, understand and trace the execution of programs written in C language.
CO2	Write programs that perform operations using derived data types
CO3	Solve an algebraic or transcendental equation using an appropriate numerical method
CO4	Solve a linear system of equations using an appropriate numerical method.
CO5	Perform an error analysis for a given numerical method

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Algebra-I
Course Code	**HMAM11**
Class	I year (2015-2016)
Semester	Odd
Staff Name	Dr. Mrs. Grace Prema
Credits	5
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Syllabus

1.1 Paper 1-Algebra-I

Text: Topics in Algebra, Second Edition, I.N.Herstein, Willey India Edition.

Unit 1: Homomorphisms - Automorphisms - Cayley's Theorem. (Sections 2.7. 2.8 and 2.9) Problems: Section 2.7(1 to 6 and 8 to 13), Section 2.8(2 to 6) and Section 2.9(all problems)

Unit 2: Permutation groups-Another counting principle-Sylow's Theorems. (Sections 2.10.2.11 and 2.12)

Problems: Section 2.10(1 to 17), Section 2.11(5 to 19) and Section 2.12(1 to 13)

Unit 3: Direct Products-Finite Abelian Groups. (Sections 2.13 and 2.14) Problems: Section 2.13(1 to 10) and Section 2.14(1 to 12)

Unit 4: The Field of Quotients of an Integral Domain-Euclidean Rings-A Particular Euclidean Ring. (Sections 3.6, 3.7 and 3.8) Problems: Section 3.6(1 to 4). Section 3.7(1 to 8) and Section 3.8(1 to 9)

Unit 5: Polynomial Rings-Polynomials over the Rational Field-Polynomials over Commutative Rings (Sections 3.9, 3.10 and 3.11) Problems: Section 3.91 to 7), Section 3.10(1 to 5) and Section 3.11(1 to 15) (Supplementary problems are not included)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2015
1-L1	Unit-I Introduction
2-L2	Homomorphisms
3- L3	Homomorphisms
4-L4	Homomorphisms
5-L5	Automorphisms
6-L6	Automorphisms
7-L7	Automorphisms
8-L8	Cayley's Theorem
9-L9	Problems: Section 2.7(1,2)
10-L10	Problems: Section 2.7(3,4)
11-L11	Problems: Section 2.7(5,6)
12-L12	Problems: Section 2.7(8,9)
13-L13	Problems: Section 2.7(10,11,12,13)
14-L14	Problems: Section 2.8(2,3,4,5)
15-L15	Problems: Section 2.9
16-P1	**Welcoming of First year and Inauguration of Mathematics Association**
17-L16	Problems: Section 2.9
18-L17	Problems: Section 2.9
19-L18	Unit-II Introduction
20-L19	Permutation groups
21-L20	Permutation groups
22-L21	Another counting principle
23-L22	Another counting principle
24-L23	Sylow's Theorems
25-L24	Sylow's Theorems
26-L25	Sylow's Theorems
27-L26	Sylow's Theorems
28-L27	Sylow's Theorems
29-L28	**Allotting portion for Internal Test-I**
	Internal Test I begins(20-07-2015)
30-L29	Problems: Section 2.10(1 to 5)
31- L30	Problems: Section 2.10(6 to 10)
32- IT-1	**Internal Test-I**
33- L31	Problems: Section 2.10(11 to 14)
34- L32	Problems: Section 2.10(15 to 17)
35- L33	Problems: Section 2.11(5 to 10)
36- L34	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
37- L35	Problems: Section 2.11(11 to 15)
38- L36	Problems: Section 2.11(16 to 19)
39- L37	Problems: Section 2.12(1 to 4)
40- P2	**College level meeting/Cell function**
41- L38	Problems: Section 2.12(5 to 8)
42- L39	Problems: Section 2.12(9 to 13)

43- L40	Unit-III Introduction
44- L41	Direct Products
45- L42	Direct Products
46- L43	Direct Products
47- L44	Finite Abelian Groups
48- L45	Finite Abelian Groups
49- L46	Finite Abelian Groups
50- L47	Problems: Section 2.13(1 to 3)
51- L48	Problems: Section 2.13(4 to 6)
52- L49	Problems: Section 2.13(7 to 10)
53- L50	Problems: Section 2.14(1 to 4)
54- L51	Problems: Section 2.14(5 to 8)
55- P3	**Department Seminar**
56-L52	Problems: Section 2.14(9 to 12)
57-L53	Unit-IV Introduction
58-L54	The Field of Quotients of an Integral Domain
59- 55L	The Field of Quotients of an Integral Domain
60- L56	The Field of Quotients of an Integral Domain
61- L57	The Field of Quotients of an Integral Domain
62- L58	**Allotting portion for Internal Test-II**
	Internal Test II begins(31-08-2015)
63- L59	The Field of Quotients of an Integral Domain
64- L60	Euclidean Rings
65- IT-II	**Internal Test-II**
66- L61	Euclidean Rings
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Euclidean Rings
69- L64	Euclidean Rings
70- L65	Euclidean Rings
71- L66	Euclidean Rings
72- L67	A Particular Euclidean Ring
73- L68	A Particular Euclidean Ring
74- L69	A Particular Euclidean Ring
75- L70	A Particular Euclidean Ring
76- L71	A Particular Euclidean Ring
77- L72	A Particular Euclidean Ring
78- L73	Problems: Section 3.6(1 to 4)
79-L74	Problems: Section 3.7(1 to 4)
80-L75	Problems: Section 3.7(5 to 8)
81-L76	Problems: Section 3.8(1 to 3)
82-L77	Problems: Section 3.8(4 to 6)
83-L78	Problems: Section 3.6(7 to 9)
84-L79	Unit-V Introduction
85-L80	Polynomial Rings
86-L81	Polynomial Rings
87-L82	Polynomial Rings
88-L83	Polynomials over the Rational Field

89-L84	Polynomials over the Rational Field
90-P4	**College level meeting/ function**
91-L85	Polynomials over the Rational Field
92-L86	Polynomials over the Rational Field
93-L87	Polynomials over Commutative Rings
94-L88	Polynomials over Commutative Rings
95-L89	Polynomials over Commutative Rings
96-L90	Polynomials over the Rational Field
97-L91	Polynomials over Commutative Rings
98-L92	Problems: Section 3.9(1 to 3)
99-L93	Problems: Section 3.9(4 & 5)
100-L94	Problems: Section 3.9(6 & 7)
101-L95	Problems: Section 3.10(1 to 3)
102-L96	Problems: Section 3.10(4 to 5)
103-L97	Problems: Section 3.11(1 to 3)
104-L98	Problems: Section 3.11(4 to 6)
105-L99	Problems: Section 3.11(7 to 9)
106-L100	Problems: Section 3.11(10 & 11)
107-L101	Problems: Section 3.11(12 & 13)
108-L102	Problems: Section 3.11(14 & 15)
109- L103	**Allotting portion for Internal Test-III**
	Internal Test III begins(5-10-2015)
110- L104	Revision
111- L105	Revision
112-IT-III	**Internal Test-III**
113- L106	Revision
114- L107	**Test Paper distribution and result analysis**
115- L108	Revision
	Entering Internal Test-III Marks into University portal
116-MT	**Model Test (16-10-2015)**
117-MT	**Model Test**
118-MT	**Model Test**
119-L109	**Model test paper distribution and previous year university question paper discussion**
120-L110	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29-10-2015

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra-I"
CO1	Learners will acquire knowledge on Counting Principle and Homomorphisms.
CO2	Knowledge gained about Automorphisms and Cayley's theorem.
CO3	Learners will gain knowledge about Permutation groups, Sylow's theorems and Direct products.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis-I
Course Code	**HMAM12**
Class	I year (2015-2016)
Semester	Odd
Staff Name	Dr. Mrs. J. suresh Suseela
Credits	5
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Syllabus

1.2 Paper 2-Analysis-I

Text: Principles of Mathematical Analysis, Third Edition, Walter Rudin-Mcgraw-Hill International Book Company.

Unit 1: Metric spaces-Compact sets-Perfect sets-Cantor sets-Connected sets. (Sections 2.15 to 2.47) Exercise Problems: Chapter 2(5 to 20)

Unit 2: Convergence sequences-Series-The number e. (Sections 3.1 to 3.32) Exercise Problems: Chapter 3(1 to 8)

Unit 3: The root and ratio tests-Power series-Absolute Convergence-Rearrangements. (Sections 3.33 and 3.55) Exercise Problems: Chapter 39 to 13)

Unit 4: Continuity. (Chapter 4) Exercise Problems: Chapter 4(Ito 5, 14 to 16 and 18 to 20)

Unit 5: Differentiation. (Chapter 5) Exercise Problems: Chapter 5(Ito 12)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2015
1-L1	Unit-I Introduction
2-L2	Metric spaces
3- L3	Metric spaces
4-L4	Metric spaces
5-L5	Metric spaces
6-L6	Metric spaces
7-L7	Compact sets
8-L8	Compact sets
9-L9	Compact sets
10-L10	Compact sets
11-L11	Compact sets
12-L12	Perfect sets
13-L13	Perfect sets
14-L14	Perfect sets
15-L15	Perfect sets
16-P1	**Welcoming of First year and Inauguration of Mathematics Association**
17-L16	Cantor sets
18-L17	Cantor sets
19-L18	Cantor sets
20-L19	Connected sets
21-L20	Connected sets
22-L21	Connected sets
23-L22	Connected sets
24-L23	Exercise Problems: Chapter 2(5 to 7)
25-L24	Exercise Problems: Chapter 2(8 to 10)
26-L25	Exercise Problems: Chapter 2(11 to 13)
27-L26	Exercise Problems: Chapter 2(14 to 17)
28-L27	Exercise Problems: Chapter 2(18 to 20)
29-L28	**Allotting portion for Internal Test-I**
	Internal Test I begins(20-07-2015)
30-L29	Unit-II Introduction
31- L30	Convergence sequences
32- IT-1	**Internal Test-I**
33- L31	Convergence sequences
34- L32	Convergence sequences
35- L33	Convergence sequences
36- L34	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
37- L35	Series
38- L36	Series

39- L37	Series
40- P2	**College level meeting/Cell function**
41- L38	Series
42- L39	Series
43- L40	The number e
44- L41	The number e
45- L42	The number e
46- L43	The number e
47- L44	Exercise Problems: Chapter 3(1,2)
48- L45	Exercise Problems: Chapter 3(3,4)
49- L46	Exercise Problems: Chapter 3(5,6)
50- L47	Exercise Problems: Chapter 3(7,8)
51- L48	Unit-III Introduction
52- L49	The root test
53- L50	The root test
54- L51	The ratio test
55- P3	**Department Seminar**
56-L52	The ratio test
57-L53	Power series
58-L54	Power series
59- 55L	Power series
60- L56	Power series
61- L57	Absolute Convergence
62- L58	**Allotting portion for Internal Test-II**
	Internal Test II begins(31-08-2015)
63- L59	Absolute Convergence
64- L60	Absolute Convergence
65- IT-II	**Internal Test-II**
66- L61	Absolute Convergence
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Rearrangements
69- L64	Rearrangements
70- L65	Rearrangements
71- L66	Rearrangements
72- L67	Exercise Problems: Chapter 3(9 to 11)
73- L68	Exercise Problems: Chapter 3(12,13)
74- L69	Unit-IV Introduction
75- L70	Continuity.
76- L71	Continuity.
77- L72	Continuity.
78- L73	Continuity.
79-L74	Continuity.
80-L75	Continuity.
81-L76	Exercise Problems: Chapter 4(1 to 3)
82-L77	Exercise Problems: Chapter 4(4,5)
83-L78	Exercise Problems: Chapter 4(14,15)
84-L79	Exercise Problems: Chapter 4(16,18)

85-L80	Exercise Problems: Chapter 4(19,20)
86-L81	Unit-V Introduction
87-L82	Differentiation
88-L83	Differentiation
89-L84	Differentiation
90-P4	**College level meeting/ function**
91-L85	Differentiation
92-L86	Differentiation
93-L87	Differentiation
94-L88	Differentiation
95-L89	Differentiation
96-L90	Exercise Problems: Chapter 5(1,2)
97-L91	Exercise Problems: Chapter 5(3,4)
98-L92	Exercise Problems: Chapter 5(5,6)
99-L93	Exercise Problems: Chapter 5(7,8)
100-L94	Exercise Problems: Chapter 5(9,10)
101-L95	Exercise Problems: Chapter 5(10)
102-L96	Exercise Problems: Chapter 5(11)
103-L97	Exercise Problems: Chapter 5(12)
104-L98	Problems
105-L99	Problems
106-L100	Problems
107-L101	Problems
108-L102	Problems
109- L103	**Allotting portion for Internal Test-III**
	Internal Test III begins(5-10-2015)
110- L104	Revision
111- L105	Revision
112-IT-III	**Internal Test-III**
113- L106	Revision
114- L107	**Test Paper distribution and result analysis**
115- L108	Revision
	Entering Internal Test-III Marks into University portal
116-MT	**Model Test (16-10-2015)**
117-MT	**Model Test**
118-MT	**Model Test**
119-L109	**Model test paper distribution and previous year university question paper discussion**
120-L110	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29-10-2015

Course Outcomes

Learning Outcomes	**COs** of the course “Analysis-I”
CO1	Acquisition of knowledge about Metric spaces, Compact sets, Perfect sets, Cantor sets and Connected sets.

CO2	Learners will gain knowledge about Convergence sequences, Sub sequences, Cauchy sequence, Lower and Upper limits, Series and Some special sequences
CO3	Knowledge gained about Root test and Ratio test
CO4	Students will gain knowledge on Continuity, Limit of functions and Discontinuous.
CO5	Students will know about Differentiation, Derivative of a real function, L'Hospital Rule and Taylor's theorem

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Probability & Statistics
Course Code	**HMAM13**
Class	I year (2015-2016)
Semester	Odd
Staff Name	Dr. Mr. Alwyn Asir
Credits	5
L. Hours /P. Hours	7 / WK
Total 105Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 95 Hrs (5 units; 5×19=95; 19Hrs /unit)	

Syllabus

1.3 Paper 3-Probability and Statistics

Text: Introduction to Mathematical Statistics, Fourth Edition-Robert V. Hogg and Allen T.Craig. Pearson Education Asia.

Unit 1: Chebyshev's inequality-Conditional Probability and Stochastic Independence. (Chapter 1-Section 1.11 and Chapter 2) Exercise Problems: Chapter 1(1.104, 1.105. 1.106) and Chapter 2(2.1 to 2.33)

Unit 2: Some special Distributions.(Chapter 3) Exercise Problems: Chapter 3(3.1 to 3.54 and 3.62 to 3.65)

Unit 3: Sampling Theory-Transformation of Variables-t and F distributions. (Chapter 4-Section 4.1 to 4.4) Exercise Problems: Chapter 4(4.1 to 4.41)

Unit 4: Change of variable Technique-The MGF technique-Distributions of X and

- Expectations of functions of random variables.

(Chapter 4-Section 4.5 to 49) Exercise Problems: Chapter 4 (4.42, 4.43, 4.50 to 4.60.4.68 to 4.74 and 4.83 to 4.98)

Unit 5: Limiting Distributions. (Chapter 5)

Exercise Problems: Chapter 5(5.1 to 5.16, 5.20 to 5.27 and 5.30 to 5.35)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2015
1-L1	Unit-I Introduction
2-L2	Chebyshev's inequality
3- L3	Chebyshev's inequality
4-L4	Chebyshev's inequality
5-L5	Chebyshev's inequality
6-L6	Conditional Probability
7-L7	Conditional Probability
8-L8	Conditional Probability
9-L9	Conditional Probability
10-L10	Stochastic Independence
11-L11	Stochastic Independence
12-L12	Stochastic Independence
13-P1	**Welcoming of First year and Inauguration of MathematicsAssociation**
14-L13	Stochastic Independence
15-L14	Exercise Problems: Chapter 1(1.104, 1.105. 1.106)
16-L15	Exercise Problems: Chapter 2(2.1-2.5)
17-L16	Exercise Problems: Chapter 2(2.6-2.9)
18-L17	Exercise Problems: Chapter 2(2.10-2.15)
19-L18	Exercise Problems: Chapter 2(2.16-2.20)
20-L19	Exercise Problems: Chapter 2(2.21-2.24)
21-L20	Exercise Problems: Chapter 2(2.25-2.29)
22-L21	Exercise Problems: Chapter 2(2.30-2.33)
23-L22	Unit-II Introduction
24-L23	Some special Distributions
25-L24	**Allotting portion for Internal Test-I**
	Internal Test I begins(20-07-2015)
26-L25	Some special Distributions
27-L26	Some special Distributions
28-IT-1	**Internal Test-I**
29-L27	Some special Distributions
30-L28	Some special Distributions
31- L29	Some special Distributions
32- L30	Some special Distributions
33- L31	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
34- L32	Exercise Problems: Chapter 3(3.1 to 3.8)
35- L33	Exercise Problems: Chapter 3(3.9 to 3.16)
36- L33	Exercise Problems: Chapter 3(3.17 to 3.24)
37- L35	Exercise Problems: Chapter 3(3.25 to 3.30)
38- L36	Exercise Problems: Chapter 3(3.31 to 3.38)
39- L37	Exercise Problems: Chapter 3(3.39 to 3.48)
40-P2	**College level meeting/Cell function**
41- L38	Exercise Problems: Chapter 3(3.49 to 3.54)

42- L39	Exercise Problems: Chapter 3(3.62 to 3.65)
43- L40	Unit-III Introduction
44- L41	Sampling Theory
45- L42	Sampling Theory
46- L43	Sampling Theory
47- L44	Sampling Theory
48- L45	Transformation of Variables
49- L46	Transformation of Variables
50- L47	Transformation of Variables
51- L48	Transformation of Variables
52- L49	t distributions
53- L50	t distributions
54- P3	**Department Seminar**
55- L51	t distributions
56- L52	t distributions
57- L53	F distributions
58- L54	**Allotting portion for Internal Test-II**
59- L55	**Internal Test II begins(31-08-2015)**
60- L56	F distributions
61- L57	F distributions
62- IT-II	**Internal Test-II**
63- L58	Exercise Problems: Chapter 4(4.1 to 4.10)
64- L59	Exercise Problems: Chapter 4(4.11 to 4.20)
65- L60	Exercise Problems: Chapter 4(4.21 to 4.30)
66- L61	Exercise Problems: Chapter 4(4.31 to 4.41)
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Unit-IV Introduction
69- L64	Change of variable Technique
70- L65	Change of variable Technique
71- L66	The MGF technique
72- L67	The MGF technique
73- L68	Distributions of X
74- L69	Expectations of functions of random variables
75- L70	Exercise Problems: Chapter 4 (4.42, 4.43, 4.50 to 4.60)
76- L71	Exercise Problems: Chapter 4 (4.68 to 4.74)
77- L72	Exercise Problems: Chapter 4 (4.83 to 4.90)
78- L73	Exercise Problems: Chapter 4 (4.91 to 4.98)
79- L74	Unit-V Introduction
80- L75	Limiting Distributions
81- L76	Limiting Distributions
82- P4	**College level meeting/ function**
83- L77	Limiting Distributions
84- L78	Limiting Distributions
85- L79	Limiting Distributions
86- L80	Limiting Distributions
87- L81	Limiting Distributions
88- L82	Exercise Problems: Chapter 5(5.1 to 5.8)

89- L83	Exercise Problems: Chapter 5(5.9 to 5.16)
90- L84	Exercise Problems: Chapter 5(5.20 to 5.23)
91- L85	Exercise Problems: Chapter 5(5.24 and 5.27)
92- L86	Exercise Problems: Chapter 5(5.30 to 5.35)
93- L87	Problems
94- L88	**Allotting portion for Internal Test-III**
	Internal Test III begins(5-10-2015)
95- L89	Revision
96- IT-III	**Internal Test-III**
97- L90	Revision
98- L91	Revision
99- L92	**Test Paper distribution and result analysis**
100- L93	Revision
	Entering Internal Test-III Marks into University portal
101- MT	**Model Test (16-10-2015)**
102- MT	**Model Test**
103- MT	**Model Test**
104- L94	**Model test paper distribution and previous year university question paper discussion**
105- L-95	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29-10-2015

Course Outcomes

Learning Outcomes	**COs** of the course “<Probability & Statistics>”
CO1	Gain the knowledge on probability distributions.
CO2	Gain knowledge on Concepts of Random Variables and Distributions.
CO3	Acquire knowledge on Basic Concepts of Expectation and continuous & discrete distribution.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Complex Analysis
Course Code	**HMAM31**
Class	II year (2015-2016)
Semester	Odd
Staff Name	Dr. Mr. J. Vijaya Xavier Parthban
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To gain advanced knowledge about Complex functions and Analytic functions as mappings.

Syllabus

Text: Complex Analysis-Lars V. Ahlfors-Tata McGraw Hill(Third Edition)

Unit 1: Analytic functions-Polynomials-Power series. (Chapter 2: Section 1.1 to 2.5) Problems: Section 1.2(1 to 7), Section 1.4(1 to 6). Section 2.2(1 to 5) and Section 2.4(1 to 4)

Unit 2: Exponential and Trigonometric functions Arcs and closed curves=-Analytic functions in regions-Conformal mapping-Linear transformations-Symmetry (Chapter 2: Section 3.1 to 3.4 and Chapter 3: Section 2.1 to 3.3) Problems: Chapter 2- Section 3.2(1 to 4) and Chapter 3- Section 3.1(1 to 4). Section 3.2(1 to 3). Section 3.3(1 to 7)

Unit 3. Oriented circles-Families of circles-Line integrals, Rectifiable arcLine integrals as functions of arcs-Cauchy's theorem for a rectangleCauchy's theorem in a disc. (Chapter 3: Section 3.4.3.5 and Chapter 4: Section 1.1 to 1.5) Problems: Chapter 3- Section 3.5(1 to 6) and Chapter 4- Section 1.3(1 to 7)

Unit 4: Cauchy's integral formula: Index of a point-the integral formulaHigher derivatives-Taylor's theorem-Zeroes and Poles-the local mapping (Chapter 4: Section 2.1 to 3.3) Problems: Chapter 4- Section 2.2(1 to3), Section 2.3(1) and Section 3.2(1to 4)

Unit 5: The maximum principle-Calculus of Residues-The argument principle-Evaluation of definite integrals. (Chapter 4: Section 3.4 and 5.1 to 5.3) Problems: Chapter 4. Section 3.4(1 and 2). Section 5.2(1 to 3) and Section 5.3 (1 to 3)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-06-2015
1-L1	Unit-I Introduction
2-L2	Analytic functions
3- L3	Analytic functions
4-L4	Polynomials
5-L5	Polynomials
6-L6	Power series
7-L7	Power series
8-L8	Problems: Section 1.2(1 to 4)
9-L9	Problems: Section 1.2(3 to 7)
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Problems: Section 1.4(1 to 6)
12-L11	Problems: Section 2.2(1 to 5)
13-L12	Problems: Section 2.4(1 to 4)
14-L13	Unit-II Introduction
15-L14	Exponential functions
16-L15	Exponential functions
17-L16	Trigonometric functions
18-L17	Trigonometric functions
19-L18	Arcs and closed curves
20-L19	Arcs and closed curves
21-L20	Analytic functions in regions
22-L21	Analytic functions in regions
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins(20-07-2015)
24-L23	Conformal mapping
25-L24	Conformal mapping
26-IT-1	**Internal Test-I**
27-L25	Linear transformations
28-L26	Linear transformations
29-L27	Symmetry
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Symmetry
32- L30	Problems: Chapter 2- Section 3.2(1 to 4)
33- L31	Problems: Chapter 3- Section 3.1(1 to 4)
34-P2	**College level meeting/Cell function**
35- L32	Problems: Chapter 2- Section 3.2(1 to 3)
36- L33	Problems: Chapter 2- Section 3.3(1 to 7)
37- L34	Unit-III Introduction
38- L35	Oriented circles

39- L36	Families of circles
40- L37	Line integrals
41- L38	Rectifiable arc
42- L39	Line integrals as functions of arcs
43- L40	Cauchy's theorem for a rectangle
44- L41	Cauchy's theorem in a disc
45- L42	Problems: Chapter 3- Section 3.5(1 to 6)
46- L43	Problems: Chapter 4- Section 1.3(1 to 7)
47- L44	Unit-IV Introduction
48- L45	Cauchy's integral formula
49- L46	Index of a point
50- L47	the integral formula-
51- P3	**Department Seminar**
52- L48	Higher derivatives
53- L49	Taylor's theorem
54- L50	Zeroes and Poles
55- L51	the local mapping
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(31-08-2015)
57-L53	Problems: Chapter 4- Section 2.2(1 to3)&Section 2.3(1)
58-L54	Problems: Chapter 4- Section 3.2(1to 4)
59-IT-II	**Internal Test-II**
60- L55	Problems
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Unit-V Introduction
63- L58	The maximum principle
64- L59	Calculus of Residues
65- L60	Calculus of Residues
66- L61	Calculus of Residues
67- L62	The argument principle
68- L63	The argument principle
69- L64	The argument principle
70- L65	The argument principle
71- L66	Evaluation of definite integrals
72- L67	Evaluation of definite integrals
73- L68	Evaluation of definite integrals
74-P4	**College level meeting/ function**
75- L69	Problems: Chapter 4. Section 3.4(1 and 2)
76- L70	Problems: Chapter 4. Section 5.2(1 to 3)
77- L71	Problems: Chapter 4. Section 5.3 (1 to 3)
78- L72	Problems
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins(05-10-2015)
80- L74	Revision
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision

84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (16-10-2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29-10-2015

Course Outcomes

Learning Outcomes	**COs** of the course “<Complex analysis>”
CO1	[illegible]
CO2	[illegible]
CO3	[illegible]

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Topology
Course Code	**HMAM32**
Class	II year (2015-2016)
Semester	Odd
Staff Name	Dr. Mrs. Suresh Suseela
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- [illegible]
- To get the Knowledge about Topological Spaces and the theories based on these Spaces.

Syllabus

Text: Topology (Second Edition) James R. Munkres, Printice-Hall of India Private Limited

Unit 1: Topological spaces-closed sets and limit points. (Chapter 2: Section 12 to 17)

Problems: Section 13(all exercise problems), Section 16(1 to 6) and Section 17

(1 to 15)

Unit 2: Continuous functions-Product topology-Quotient topology. (Chapter 2: Section 18, 19 and 22) Problems: Section 18(1 to 8), Section 19(1 to 9) and Section 22(1 to 5)

Unit 3: Connected spaces-Compact spaces. (Chapter 3: Section 23 and 26) Problems: Section 23(1 to 6) and Section 26(1 to 9)

Unit 4: The Countability Axioms - The separation Axioms-Normal spaces. (Chapter 4: Section 30 to 32) Problems: Section 30(1 to 5), Section 31(1 to 7) and Section 32(1 to 7)

Unit 5: The Urysohn Lemma-The UrysohnMetrization Theorem-The Tietze Extension Theorem (Chapter 4: Section 33 to 35) Problems: Section 331 to 5) and Section 35(1 to 4)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-06-2015
1-L1	Introduction
2-L2	Topological spaces
3- L3	Topological spaces
4-L4	Topological spaces
5-L5	Topological spaces
6-L6	Topological spaces
7-L7	closed sets and limit points
8-L8	closed sets and limit points
9-L9	closed sets and limit points
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Problems: Section 13(all exercise problems)
12-L11	Problems: Section 13(all exercise problems)
13-L12	Continuous functions-Product topology
14-L13	Continuous functions-Product topology
15-L14	Continuous functions-Product topology
16-L15	Quotient topology
17-L16	Quotient topology
18-L17	Quotient topology
19-L18	Quotient topology
20-L19	Problems: Section 18(1 to 4)
21-L20	Problems: Section 18(5 to 8)
22-L21	Problems: Section 19(1 to 4)
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins(20-07-2015)
24-L23	Problems: Section 22(1 to 5)
25-L24	Problems: Section 18(5 to 8)
26-IT-1	**Internal Test-I**
27-L25	Connected spaces
28-L26	Connected spaces
29-L27	Connected spaces
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Compact spaces
32- L30	Compact spaces
33- L31	Compact spaces
34-P2	**College level meeting/Cell function**
35- L32	Compact spaces

36- L33	Compact spaces
37- L34	Problems: Section 23(1 to 3)
38- L35	Problems: Section 23(4 to 6)
39- L36	Problems: Section 26(1 to 4)
40- L37	Problems: Section 26(5 to 9)
41- L38	The Countability Axioms
42- L39	The Countability Axioms
43- L40	The Countability Axioms
44- L41	The Countability Axioms
45- L42	The Countability Axioms
46- L43	The separation Axioms
47- L44	The separation Axioms
48- L45	The separation Axioms
49- L46	The separation Axioms
50- L47	Normal spaces
51- P3	**Department Seminar**
52- L48	Normal spaces
53- L49	Normal spaces
54- L50	Normal spaces
55- L51	Normal spaces
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(31-08-2015)
57-L53	Problems: Section 30(1 to 3)
58-L54	Problems: Section 30(4, 5)
59-IT-II	**Internal Test-II**
60- L55	Problems: Section 31(1 to 4)
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems: Section 31(5 to 7)
63- L58	Problems: Section 32(1 to 4)
64- L59	Problems: Section 32(5 to 7)
65- L60	The Urysohn Lemma
66- L61	The Urysohn Lemma
67- L62	The Urysohn Lemma
68- L63	The Urysohn Lemma
69- L64	The UrysohnMetrization Theorem
70- L65	The UrysohnMetrization Theorem
71- L66	The UrysohnMetrization Theorem
72- L67	The Tietze Extension Theorem
73- L68	The Tietze Extension Theorem
74-P4	**College level meeting/ function**
75- L69	The Tietze Extension Theorem
76- L70	The Tietze Extension Theorem
77- L71	Problems: Section 33(1 to 3)
78- L72	Problems: Section 33(4, 5)
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins(05-10-2015)
80- L74	Problems: Section 35(1 ,2)

81- L75	Problems: Section 35(3, 4)
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (16-10-2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29-10-2015

Course Outcomes

Learning Outcomes	**COs** of the course "Topology"
CO 1	[illegible]
CO 2	[illegible]
CO 3	Knowledge gained about Topological Spaces and the theories based on these Spaces.
CO 4	Basic knowledge in Set Theory and Analysis at undergraduate level.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Differential Geometry
Course Code	**HMAM33**
Class	II year (2015-2016)
Semester	Odd
Staff Name	Mrs. W. Rajammal Ranjitha Mary
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To be able to understand the fundamental theorem for plane curves
- To understand fundamental abstract topological structures
- To improve problem solving skills
- To introduce essential ideas and methods of differential geometry

Syllabus

DIFFERENTIAL GEOMETRY

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 18-06-2015
1-L1	UNIT I - THE THEORY OF SPACE CURVES- Introduction of Space curves
2-L2	Definitions of space curves
3- L3	Arc Length
4-L4	Problems on Arc Length
5-L5	Tangent – unit tangent vector
6-L6	Osculating plane
7-L7	Problems on Osculating plane
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Normal - Unit normal vector –Normal plane
10- L9	Theorems on Osculating plane and Normal plane
11-L10	Curvatures of a curve
12-L11	Behaviour of a curve in the neighbourhood of a point on it.
13-L12	Torsion of a curve
14-L13	Curvature &torsion of a curve given as the intersection of two surfaces.
15-L14	UNITII**:** CONTACT BETWEEN CURVES AND SURFACES - Introduction
16-L15	Osculating Circle and Osculating Sphere
17- L16	Locus of centre of Spherical curvature
18- L17	Tangent surface of a curves
19- L18	Involutes of a curve
20- L19	Evolutes of a curve
21- L20	Helices - **Allotting portion for Internal Test-I**
	Internal Test I begins on 20-07-2015
22- L21	To find the equation of the Involutes
23- IT-1	**Internal Test-I**
24- L22	To find the equation of the Evolutes

25- L23	Definition of circular helices and cylindrical helices
26- L24	Characteristic property of Helices-**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Circular helix and Cylindrical helix
28- L26	Relation between the curvatures of a general helix and its projection on a plane orthogonal to its axis
29- L27	**UNIT III:** DEFINITION OF A SURFACE - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Definition of a curve on a surface
32-L29	Definition Of Parametric Equations – Proper Transformation
33-L30	Equivalent relations of two surfaces
34- L31	Curves on surface
35- L32	Parametric curves and orthogonal to each other
36- L33	Definitions of a Helicoids
37- L34	Right helicoids and General helicoids
38-L35	Definition of Metric
39- L36	Problems on Metric
40- L37	Angle between Parametric curves
41- L38	Elements of area
42-P3	**Department Seminar**
43- L39	Direction coefficients
44- L40	UNIT IV- FAMILIES OF CURVES – Introduction
45- L41	General significance of the sense of the tangent vector
46- L42	Orthogonal trajectories
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins(31-08-2015)
48- L44	Problems on Orthogonal trajectories
49-IT-II	**Internal Test-II**
50-L45	Double family of curves
51- L46	Geodesics - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Derivation of equations to Geodesics
53- L48	Problems on Geodesics
54- L49	Problems on Geodesics
55- L50	Canonical geodesics equations
56- L51	Normal property of Geodesics
57- L52	Equivalent statement of the normal property
58- L53	UNIT V- GEODESIC CURVATURE-Introduction
59-P4	**College level meeting/ function**
60- L54	Examples on Geodesic curvature
61- L55	Problems onGeodesic curvature
62- L56	Second Fundamental form
63- L57	Mensniersthrorem
64- L58	Principal Curvature- **Allotting portion for Internal Test-III**
	Internal Test III begins on 05-10-2015
65- L59	□□□
66- L60	Euler's theorem
67-IT-III	**Internal Test-III**

68- L61	Liouville's formula
69- L62	Geometrical interpretation of the second fundamental form
70- L63	Classification of point on a surface - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (16-10-2015)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29-10-2015

Course Outcomes

Learning Outcomes	**COs** of the course "Differential Geometry"
CO1	Appreciation and understanding of what makes properties and arguments geometric
CO2	Understanding between intrinsic and extrinsic properties
CO3	Define the equivalence of two curves
CO4	Define surfaces and their properties
CO5	Express tangent spaces of surfaces
Integrated Activity	
IA1	Rigorous treatment to the concepts and methods of differential geometry via the classical theory of curves and surfaces in Euclidean space
IA2	Able to understand the classical theory of curves and surfaces

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Operations Research
Course Code	**HMAM34**
Class	II year (2015-2016)
Semester	Odd
Staff Name	Dr. Mrs. J. Suresh Suseela
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To determine real life into Standard Mathematical Models
- To get Basic computing knowledge and techniques at undergraduate level.

Syllabus

Text: Operations Research Principles and Applications-G.Srinivasan-PHI learning private limited-New Delhi-EEE edition.

Unit 1: Integer Programming.(Chapter 7 and all exercise problems)

Unit 2: Network Problems-Minimum spanning tree problem-The shortest path problem-The maximum flow problem-The minimum cost problem.

(Chapter 8: Section 8.5 to 8.9 and all exercise problems)

Unit 3: Travelling salesman and distribution problem. (Chapter 9 and all exercise problems)

Unit 4: Basic Queueing models. (Chapter 11 and all exercise problems)

Unit 5: Deterministic inventory models. (Chapter 13 and all exercise problems) 3.5. Paper-14-Project

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-06-2015
1-L1	Introduction
2-L2	Integer Programming
3- L3	Integer Programming
4-L4	Integer Programming
5-L5	Integer Programming
6-L6	Integer Programming
7-L7	Integer Programming
8-L8	Integer Programming
9-L9	Integer Programming
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Exercise Problems
12-L11	Exercise Problems
13-L12	Network Problems
14-L13	Network Problems
15-L14	Network Problems
16-L15	Minimum spanning tree problem
17-L16	Minimum spanning tree problem
18-L17	Minimum spanning tree problem
19-L18	Minimum spanning tree problem
20-L19	The shortest path problem
21-L20	The shortest path problem
22-L21	The shortest path problem
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins(20-07-2015)
24-L23	The shortest path problem
25-L24	The shortest path problem
26-IT-1	**Internal Test-I**
27-L25	The maximum flow problem
28-L26	The maximum flow problem
29-L27	The maximum flow problem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	The maximum flow problem
32- L30	The maximum flow problem
33- L31	The minimum cost problem
34-P2	**College level meeting/Cell function**
35- L32	The minimum cost problem
36- L33	The minimum cost problem
37- L34	The minimum cost problem
38- L35	Exercise Problems
39- L36	Exercise Problems
40- L37	Travelling salesman and distribution problem

41- L38	Travelling salesman and distribution problem
42- L39	Travelling salesman and distribution problem
43- L40	Travelling salesman and distribution problem
44- L41	Travelling salesman and distribution problem
45- L42	Travelling salesman and distribution problem
46- L43	Travelling salesman and distribution problem
47- L44	Travelling salesman and distribution problem
48- L45	Travelling salesman and distribution problem
49- L46	Travelling salesman and distribution problem
50- L47	Travelling salesman and distribution problem
51- P3	**Department Seminar**
52- L48	Exercise Problems
53- L49	Exercise Problems
54- L50	Exercise Problems
55- L51	Exercise Problems
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(31-08-2015)
57-L53	Basic Queueing models
58-L54	Basic Queueing models
59-IT-II	**Internal Test-II**
60- L55	Basic Queueing models
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Basic Queueing models
63- L58	Basic Queueing models
64- L59	Basic Queueing models
65- L60	Basic Queueing models
66- L61	Basic Queueing models
67- L62	Basic Queueing models
68- L63	Basic Queueing models
69- L64	Basic Queueing models
70- L65	Exercise Problems
71- L66	Exercise Problems
72- L67	Exercise Problems
73- L68	Exercise Problems
74-P4	**College level meeting/ function**
75- L69	Deterministic inventory models
76- L70	Deterministic inventory models
77- L71	Deterministic inventory models
78- L72	Deterministic inventory models
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins(05-10-2015)
80- L74	Deterministic inventory models
81- L75	Exercise Problems
82-IT-III	**Internal Test-III**
83- L76	Exercise Problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Exercise Problems

	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (16-10-2015)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29-10-2015

Course Outcomes

Learning Outcomes	**COs** of the course "Operations Research"
CO1	To modify real life into Standard Mathematical Models.
CO2	To know classification of different structured problems.
CO3	Basic computing knowledge and techniques at undergraduate level.
CO4	Identification of actual problems and its equivalent mathematical models.
CO5	Application to different optimization techniques in real life situations.
CO6	Knowledge gained in utilization of Optimum Resources
CO7	To learn different optimization techniques.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Partial Differential Equation
Course Code	**HMAE41**
Class	II year (2016-2017)
Semester	Even
Staff Name	Mr. J. Vijaya Xavier Parthiban
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Syllabus

Text Book: Elements Of Partial Differential Equations, IAN N. SNEDDON, McGraw Hill, New Delhi,1983.

Unit I: Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$ - 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)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 01.12.2016
1-L1	Introduction
2-L2	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
3- L3	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
4-L4	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
5-L5	Pfaffian Differential Forms and Equations
6-L6	Pfaffian Differential Forms and Equations
7-L7	Pfaffian Differential Forms and Equations
8- P1	**Inauguration of Mathematics Association**
9- L8	Solution of Pfaffian Differential Equations in three variables
10- L9	Solution of Pfaffian Differential Equations in three variables
11-L10	Solution of Pfaffian Differential Equations in three variables
12-L11	Solution of Pfaffian Differential Equations in three variables
13-L12	Partial Differential equations
14-L13	Partial Differential equations
15-L14	Partial Differential equations
16-L15	Origins of first order Partial Differential equations
17- L16	Origins of first order Partial Differential equations
18- L17	Origins of first order Partial Differential equations
19- L18	Linear equations of the first order
20- L19	Linear equations of the first order
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins(24-01-2017)
22- L21	Linear equations of the first order
23- IT-1	**Internal Test-I**
24- L22	Linear equations of the first order
25- L23	Integral surfaces passing through a given curve
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Integral surfaces passing through a given curve
28- L26	Integral surfaces passing through a given curve
29- L27	Integral surfaces passing through a given curve
30- P2	**College level meeting/Cell function**
31-L28	Cauchy’s Method of Characteristics
32-L29	Cauchy’s Method of Characteristics
33-L30	Cauchy’s Method of Characteristics
34- L31	Cauchy’s Method of Characteristics
35- L32	Compatible systems of First order Equations
36- L33	Compatible systems of First order Equations
37- L34	Compatible systems of First order Equations
38-L35	Compatible systems of First order Equations

39- L36	Charpit's Method
40- L37	Charpit's Method
41- L38	Charpit's Method
42-P3	**Department Seminar**
43- L39	Second order equations in Physics
44- L40	Second order equations in Physics
45- L41	Second order equations in Physics
46- L42	Linear Partial Differential equations with Constant Coefficients
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins(24-02-2017)
48- L44	Linear Partial Differential equations with Constant Coefficients
49-IT-II	**Internal Test-II**
50-L45	Characteristics of Equations in three variables
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Characteristics of Equations in three variables
53- L48	Characteristics of Equations in three variables
54- L49	Characteristics of Equations in three variables
55- L50	Problems
56- L51	Problems
57- L52	Problems
58- L53	Separation of variables
59-P4	**College level meeting/ function**
60- L54	Separation of variables
61- L55	Separation of variables
62- L56	Separation of variables
63- L57	Separation of variables
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins(23-03-2017)
65- L59	Problems
66- L60	Problems
67-IT-III	**Internal Test-III**
68- L61	Revision
69- L62	Revision
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (05-04-2017)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Partial Differential Equation"

CO1	Acquisition of knowledge about Pfaffian Differential Forms and Equations and their Solution in three variables.
CO2	Students will know about Origins of first order Partial Differential equations.
CO3	Knowledge gained about Cauchy's Method of Characteristics and Charpit's Method.
CO4	Learners will know about Second order equations in Physics, Linear Partial Differential equations with Constant Coefficients and Characteristics of Equations in three variables.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Functional Analysis
Course Code	**HMAM41**
Class	II year (2016-2017)
Semester	Even
Staff Name	Dr. Mrs. Suresh Suseela
Credits	5
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Course Objectives

- To gain knowledge about Banach Spaces, Hilbert Spaces and Banach Algebra.
- To use algebraic structure in Analysis.

Syllabus

Text Book: Introduction to Topology and Modern Analysis-G.F.SimmonsMcGraw-Hill International Editions.

Unit 1: Banach Spaces-The Definition and some examples-Continuous linear transformations-The Hahn-Banach Theorem-The Natural imbedding of N in N**

(Chapter 9: Section 46 to 49)

Problems: Section 46(1 to 4), Section 47(1 to 7), Section 48(1 to 4) and Section 49(1 to 3)

Unit 2: The open mapping theorem-The conjugate of an operator, Hilbert Spaces-The Definition and some simple properties-Orthogonal Complements

(Chapter 9: Sections 50, 51 and Chapter 10: Sections 52, 53)

Problems: Section 50(1 to 3), Section 51(1 to 3), Section 52(1,3,4 and 6) and Section 53(1 to 4)

Unit 3: Orthonormal Sets-The Conjugate Space H*-The Adjoint of an Operator-SelfAdjoint Opertators.

(Chapter 10: Sections 54 to 57)

Problems: Section 54(1 to 5), Section 55(1 to 3), Section 56(1 to 4) and Section 57(1and 2)

Unit 4: Normal and Unitary Operators Projections, Finite Dimensional Spectral Theory-Determinants and the Spectrum of an Operator The Spectral Theorem

(Chapter 10: Sections 58, 59 and Chapter 11: Sections 61 and 62)

Problems: Section 58(1 to 4). Section 59(1 to 4), Section 611and 2) and Section 62(1 to 5)

Unit 5. General Preliminaries on Banach Algebras- The Definition and Some examples-Regular and singular elements-Topological divisors of zero-The SpectrumThe formula for the Spectral radius-The Radical and Semi-simplicity

(Chapter 12: Sections 64 to 69) (No Problems)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 01.12.2016
1-L1	Introduction
2-L2	Banach Spaces Definition
3- L3	Banach Spaces examples
4-L4	Banach Spaces examples
5-L5	Banach Spaces examples
6-L6	Continuous linear transformations
7-L7	Continuous linear transformations
8-L8	Continuous linear transformations
9-L9	Continuous linear transformations
10-L10	Continuous linear transformations
11-L11	Continuous linear transformations
12-L12	The Hahn-Banach Theorem
13-L13	The Hahn-Banach Theorem
14-L14	The Hahn-Banach Theorem
15-L15	The Hahn-Banach Theorem
16-P1	**Inauguration of Mathematics Association**
17-L16	The Hahn-Banach Theorem
18-L17	The Natural imbedding of N in N**
19-L18	The Natural imbedding of N in N**
20-L19	The Natural imbedding of N in N**
21-L20	The Natural imbedding of N in N**
22-L21	Exercise Problems
23-L22	Exercise Problems
24-L23	Exercise Problems
25-L24	The open mapping theorem

26-L25	The open mapping theorem
27-L26	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(24.01.2017)
28-L27	The open mapping theorem
29-L28	The open mapping theorem
30- IT-1	**Internal Test-I**
31- L29	The conjugate of an operator
32-L30	The conjugate of an operator
33- L31	The conjugate of an operator
34- L32	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
35- L33	Hilbert Spaces-The Definition
36- L34	Hilbert Spaces- simple properties
37- L35	Hilbert Spaces- simple properties
38- P2	**College level meeting/Cell function**
39- L36	Hilbert Spaces- simple properties
40- L37	Hilbert Spaces- simple properties
41- L38	Orthogonal Complements
42- L39	Orthogonal Complements
43- L40	Orthogonal Complements
44- L41	Orthogonal Complements
45- L42	Orthonormal Sets
46- L43	Orthonormal Sets
47- L44	Orthonormal Sets
48- L45	Orthonormal Sets
49- L46	Orthonormal Sets
50- L47	Conjugate Space H*
51- L48	Conjugate Space H*
52- L49	Conjugate Space H*
53- P3	**Department Seminar**
54- L50	Conjugate Space H*
55- L51	The Adjoint of an Operator
56-L52	The Adjoint of an Operator
57-L53	The Adjoint of an Operator
58-L54	The Adjoint of an Operator
59- 55L	SelfAdjoint Opertators
60- L56	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(24.02.2017)
61- L57	SelfAdjoint Opertators
62- L58	SelfAdjoint Opertators
63- IT-II	**Internal Test-II**
64- L59	Exercise Problems
65- L60	**Test Paper distribution and result analysis**
66- L61	**Entering Internal Test-II Marks into University portal**
67- L62	Exercise Problems
68- L63	Exercise Problems
69- L64	Exercise Problems
70- L65	Normal and Unitary Operators Projections

71- L66	Normal and Unitary Operators Projections
72- L67	Normal and Unitary Operators Projections
73- L68	Normal and Unitary Operators Projections
74- L69	Finite Dimensional Spectral Theory
75- L70	Finite Dimensional Spectral Theory
76- L71	Finite Dimensional Spectral Theory
77- L72	Finite Dimensional Spectral Theory
78- L73	Finite Dimensional Spectral Theory
79-L74	Determinants and the Spectrum of an Operator The Spectral Theorem
80-L75	Determinants and the Spectrum of an Operator The Spectral Theorem
81-L76	Determinants and the Spectrum of an Operator The Spectral Theorem
82-L77	Determinants and the Spectrum of an Operator The Spectral Theorem
83-L78	Exercise Problems
84-L79	Exercise Problems
85-L80	Exercise Problems
86-L81	General Preliminaries on Banach Algebras Definition
87-L82	General Preliminaries on Banach AlgebrasDefinition
88- P4	**College level meeting/ function**
89-L83	General Preliminaries on Banach Algebras Examples
90-L84	General Preliminaries on Banach Algebras Examples
91-L85	General Preliminaries on Banach Algebras Examples
92-L86	Regular and singular elements
93-L87	Regular and singular elements
94-L88	Regular and singular elements
95-L89	Regular and singular elements
96-L90	Topological divisors of zero
97-L91	Topological divisors of zero
98-L92	Topological divisors of zero
99-L93	Topological divisors of zero
100-L94	The Spectrum The formula for the Spectral radius
101-L95	The Spectrum The formula for the Spectral radius
102-L96	The Spectrum The formula for the Spectral radius
103-L97	The Spectrum The formula for the Spectral radius
104-L98	The Radical and Semi
105-L99	The Radical and Semi
106-L100	The Radical and Semi
107-L101	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(23.03.2017)
108-L102	The Radical and Semi
109- L103	The Radical and Semi
110-IT-III	**Internal Test-III**
111- L104	Revision
112- L105	**Test Paper distribution and result analysis**
113- L106	Revision
114- L107	**Entering Internal Test-III Marks into University portal**
115- L108	**Model Test (05.04.2017)**
116-MT	**Model Test**
117-MT	**Model Test**

118-MT	**Model test paper distribution and previous year university question paper discussion**
119-L109	**Feedback of the Course, analysis and report preparation**
120-L110	**Last Working day on 21.04.2017**

Course Outcomes

Learning Outcomes	**COs** of the course "Functional Analysis"
CO1	To gain knowledge about Banach Spaces, Hilbert Spaces and Banach Algebra.
CO2	To use algebraic structure in Analysis.
CO3	Graduates will have a strong foundations and in depth understanding of the current topics related with functional Analysis, Spectral Theory, Approximation Theory.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Measure & Integration
Course Code	**HMAM42**
Class	II year (2016-2017)
Semester	Even
Staff Name	Mrs. W. Rajammal Ranjitha Mary
Credits	8
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Course Objectives

- Basic knowledge of differentiation, integration and continuity of real functions.

Syllabus

Text: Real Analysis, Fourth Edition, H.L Royden, P.M.Fitzpatrick, PHI Learning Private Limited

Unit 1. Lebesgue Measure-Lebesgue outer measure-The c-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 (Sections 2.1 to 2.5 and 3.1) (Problems: Chapter 2: 1 to 12, 16 to 18 and Chapter 3: 1 to 6)

Unit 2: Sequential Pointwise Limits and Simple Approximation Littlewood's Three Principles, Egoroff's Theorem and Lusins 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 nonnegative function- the general Lebesgue integral-Countable Additivity and continuity of Integration, (Sections 3.2, 3,3 and 4.1 to 4.5) (Chapter 4: Problems 9 to 12, 16 to 20, 28 and 30)

Unit 3: Differentiation and Integration-Continuity of monotone functions-differentiability of monotone function: Lebesgue Theorem-Functions of pounded variations: Jordan's Theorem-Absolutely continuous functions-Integrating Derivatives: Differentiating Indefinite Integrals-Convex functions (Sections 6.1 to 6.6)(No Problems)

Unit 4: Measure and Integration - Measures and Measurable sets-Signed Measures: The Hahn and Jordan Decompositions-The Carathéodory Measure induced by an outer Measure. The construction of outer MeasureThe Carathéodory-Hahn Theorem: The extension of a Premeasure to a Measure. (Sections 17.1 to 17.5) (Chapter 17: Problems 1, 2, 5, 13, 14, 18 and 19)

Unit 5: Integration over general Measure spaces: Measurable FunctionsIntegration of Nonnegative Measurable Functions Integration of general Measurable functions-The Radon-Nikodym Theorem.19-3 (Sections 18.1 to 18:4) (Chapter 18: Problems 1, 2, 4,5, 6, 18, 19, 21, 28, 29, 31, 32, 33, 49 and17.4 50)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 01-12-2016
1-L1	Unit-I Introduction
2-L2	Lebesgue Measure
3- L3	Lebesgue outer measure
4-L4	The c-Algebra of Lebesgue Measurable sets
5-L5	Outer and Inner Approximation of Lebesgue Measurable sets
6-L6	Outer and Inner Approximation of Lebesgue Measurable sets
7-L7	Countable Additivity
8-L8	Continuity
9-L9	Borel-Cantelli Lemma
10-L10	Lebesgue Measurable functions
11-L11	Sums, Products
12-L12	Compositions
13-L13	Problems: Chapter 2: 1 to 6
14-L14	Problems: Chapter 2: 6 to 12
15-L15	Problems: Chapter 3: 1 to 6
16-P1	**Inauguration of MathematicsAssociation**
17-L16	Unit-II Introduction
18-L17	Sequential Pointwise Limits
19-L18	Simple Approximation
20-L19	Simple Approximation
21-L20	Littlewood's Three Principles
22-L21	Littlewood's Three Principles
23-L22	Littlewood's Three Principles
24-L23	Egoroff's Theorem
25-L24	Lusins Theorem
26-L25	Lebesgue Integration
27-L26	The Riemann Integral
28-L27	The Riemann Integral
29-L28	**Allotting portion for Internal Test-I**
	Internal Test I begins(24-01-2017)
30-L29	The Lebesgue Integral of a bounded measurable function over a set of finite measure

31- L30	The Lebesgue integral of a measurable nonnegative function
32- IT-1	**Internal Test-I**
33- L31	the general Lebesgue integral
34- L32	Countable Additivity
35- L33	continuity of Integration
36- L34	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
37- L35	Problems: Chapter 4(9 to 12)
38- L36	Problems: Chapter 4(16 to 20)
39- L37	Problems: Chapter 4(28 to 30)
40- P2	**College level meeting/Cell function**
41- L38	Unit-III Introduction
42- L39	Differentiation
43- L40	Integration
44- L41	Continuity of monotone functions
45- L42	Continuity of monotone functions
46- L43	differentiability of monotone function
47- L44	Lebesgue Theorem
48- L45	Functions of bounded variations
49- L46	Functions of bounded variations
50- L47	Jordan's Theorem
51- L48	Absolutely continuous functions
52- L49	Absolutely continuous functions
53- L50	Integrating Derivatives
54- L51	Differentiating Indefinite Integrals
55- P3	**Department Seminar**
56-L52	Differentiating Indefinite Integrals
57-L53	Convex functions
58-L54	Convex functions
59- 55L	Unit-IV Introduction
60- L56	Measure and Integration
61- L57	Measure and Integration
62- L58	**Allotting portion for Internal Test-II**
	Internal Test II begins(24-02-2017)
63- L59	Measures and Measurable sets
64- L60	Measures and Measurable sets
65- IT-II	**Internal Test-II**
66- L61	Signed Measures
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Signed Measures
69- L64	The Hahn and Jordan Decompositions
70- L65	The Hahn and Jordan Decompositions
71- L66	The Hahn and Jordan Decompositions
72- L67	The Carathéodory Measure induced by an outer Measure
73- L68	The Carathéodory Measure induced by an outer Measure
74- L69	The Carathéodory Measure induced by an outer Measure
75- L70	The construction of outer Measure

76- L71	The construction of outer Measure
77- L72	The construction of outer Measure
78- L73	The Carathéodory-Hahn Theorem
79-L74	The Carathéodory-Hahn Theorem
80-L75	The extension of a Premeasure to a Measure
81-L76	The extension of a Premeasure to a Measure
82-L77	The extension of a Premeasure to a Measure
83-L78	Problems 1, 2, 5
84-L79	Problems 13, 14
85-L80	Problems 18, 19
86-L81	Unit-V Introduction
87-L82	Integration over general Measure spaces
88-L83	Integration over general Measure spaces
89-L84	Integration over general Measure spaces
90-P4	**College level meeting/ function**
91-L85	Integration over general Measure spaces
92-L86	Measurable Functions
93-L87	Measurable Functions
94-L88	Measurable Functions
95-L89	Measurable Functions
96-L90	Integration of Nonnegative Measurable Functions Integration of general Measurable functions
97-L91	Integration of Nonnegative Measurable Functions Integration of general Measurable functions
98-L92	The Radon-Nikodym Theorem
99-L93	The Radon-Nikodym Theorem
100-L94	Problems 1, 2
101-L95	Problems 4, 5
102-L96	Problems 6, 18
103-L97	Problems 19, 21
104-L98	Problems 28, 29
105-L99	Problems 31, 32
106-L100	Problems 33, 49
107-L101	Problems 50
108-L102	Revision
109- L103	**Allotting portion for Internal Test-III**
	Internal Test III begins(23-03-2017)
110- L104	Revision
111- L105	Revision
112-IT-III	**Internal Test-III**
113- L106	Revision
114- L107	**Test Paper distribution and result analysis**
115- L108	Revision
	Entering Internal Test-III Marks into University portal
116-MT	**Model Test (05-04-2017)**
117-MT	**Model Test**
118-MT	**Model Test**
119-L109	**Model test paper distribution and previous year university question paper**

	discussion
120-L110	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Measure & Integration"
CO1	Understanding the concept of lesbeague measure, lesbeague integration and signed measure.
CO2	To provide the understanding of general measure spaces.
CO3	Basic knowledge of differentiation, integration and continuity of real functions.
CO4	Knowledge gained about lesbeague theory and general measure spaces and their properties and construction
CO5	Gain the knowledge of measure spaces and measure interruption.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analytic Number Theory
Course Code	**HMAM43**
Class	II year (2016-2017)
Semester	Even
Staff Name	Dr. Mr. G. Jeyakumar
Credits	5
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Course Objectives

- Define and interpret the concepts of divisibility, congruence, greatest common divisor, prime, and prime-factorization.
- Apply the Law of Quadratic Reciprocity and other methods to classify numbers as primitive roots, quadratic residues, and quadratic non-residues.

Syllabus

Text: Introduction to Analytic Number Theory-Tom M.Apostol-Springer International Student Edition

Unit 1: The fundamental theorem of Arithmetic (Chapter 1 and Exercise problems 1 to 30)

Unit 2: Arithmetic functions.(Sections 2.1 to 2.9 and Exercise problems: Chapter 2(1 to 20))

216

Unit 3: Multiplicative functions and Dirichlet Multiplication. (Sections 2.10 to 2.15 and Exercise problems : Chapter 2 (21 to 35))

Unit 4: Averages of Arithmetical functions. (Chapter 3 and Exercise problems: Chapter 3 (1 to 12))

Unit 5: Chebyshev's functions-equivalent forms of prime number theorem-Shapiro's theorem and its applications. (Sections 4.1 to 4.7 and Exercise problems: Chapter 41 to 11)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 01-12-2016
1-L1	Introduction
2-L2	The fundamental theorem of Arithmetic
3- L3	The fundamental theorem of Arithmetic
4-L4	The fundamental theorem of Arithmetic
5-L5	Exercise problems 1 to 4
6-L6	Exercise problems 5 to 10
7-L7	Exercise problems 11 to 15
8-L8	Exercise problems 16 to 20
9-L9	Exercise problems 21 to 25
10-L10	Exercise problems 26 to 30
11-L11	Arithmetic functions
12-L12	Arithmetic functions
13-L13	Arithmetic functions
14-L14	Arithmetic functions
15-L15	Arithmetic functions
16-P1	**Inauguration of Mathematics Association**
17-L16	Exercise problems: Chapter 2(1 to 4)
18-L17	Exercise problems: Chapter 2(5 to 9)
19-L18	Exercise problems: Chapter 2(10 to 14)
20-L19	Exercise problems: Chapter 2(15 to 19)
21-L20	Exercise problems: Chapter 2(20)
22-L21	Multiplicative functions
23-L22	Multiplicative functions
24-L23	Multiplicative functions
25-L24	Multiplicative functions
26-L25	Multiplicative functions
27-L26	Multiplicative functions
28-L27	Dirichlet Multiplication
29-L28	**Allotting portion for Internal Test-I**
	Internal Test I begins(24-01-2017)
30-L29	Dirichlet Multiplication
31- L30	Dirichlet Multiplication
32-IT-1	**Internal Test-I**
33- L31	Dirichlet Multiplication
34- L32	Dirichlet Multiplication
35- L33	Dirichlet Multiplication
36- L34	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
37- L35	Exercise problems : Chapter 2 (21 to 23)
38- L36	Exercise problems : Chapter 2 (24 to 26)
39- L37	Exercise problems : Chapter 2 (27 to 29)
40- P2	**College level meeting/Cell function**
41- L38	Exercise problems : Chapter 2 (30 to 32)
42- L39	Exercise problems : Chapter 2 (33 to 35)

43- L40	Averages of Arithmetical functions
44- L41	Averages of Arithmetical functions
45- L42	Averages of Arithmetical functions
46- L43	Averages of Arithmetical functions
47- L44	Averages of Arithmetical functions
48- L45	Averages of Arithmetical functions
49- L46	Averages of Arithmetical functions
50- L47	Averages of Arithmetical functions
51- L48	Averages of Arithmetical functions
52- L49	Averages of Arithmetical functions
53- L50	Averages of Arithmetical functions
54- L51	Averages of Arithmetical functions
55- P3	**Department Seminar**
56-L52	Exercise problems: Chapter 3 (1 to 3)
57-L53	Exercise problems: Chapter 3 (4 to 6)
58-L54	Exercise problems: Chapter 3 (7 to 9)
59- 55L	Exercise problems: Chapter 3 (10 to 12)
60- L56	Chebyshev's functions
61- L57	Chebyshev's functions
62- L58	**Allotting portion for Internal Test-II**
	Internal Test II begins(24-02-2017)
63- L59	Chebyshev's functions
64- L60	Chebyshev's functions
65- IT-II	**Internal Test-II**
66- L61	Chebyshev's functions
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Chebyshev's functions
69- L64	Chebyshev's functions
70- L65	Chebyshev's functions
71- L66	equivalent forms of prime number theorem
72- L67	equivalent forms of prime number theorem
73- L68	equivalent forms of prime number theorem
74- L69	equivalent forms of prime number theorem
75- L70	equivalent forms of prime number theorem
76- L71	equivalent forms of prime number theorem
77- L72	equivalent forms of prime number theorem
78- L73	equivalent forms of prime number theorem
79-L74	Shapiro's theorem and its applications
80-L75	Shapiro's theorem and its applications
81-L76	Shapiro's theorem and its applications
82-L77	Shapiro's theorem and its applications
83-L78	Shapiro's theorem and its applications
84-L79	Shapiro's theorem and its applications
85-L80	Shapiro's theorem and its applications
86-L81	Shapiro's theorem and its applications
87-L82	Shapiro's theorem and its applications
88-L83	Shapiro's theorem and its applications

89-L84	Shapiro's theorem and its applications
90-P4	**College level meeting/ function**
91-L85	Exercise problems: Chapter 4(1)
92-L86	Exercise problems: Chapter 4(2)
93-L87	Exercise problems: Chapter 4(3)
94-L88	Exercise problems: Chapter 4(4)
95-L89	Exercise problems: Chapter 4(5)
96-L90	Exercise problems: Chapter 4(6)
97-L91	Exercise problems: Chapter 4(7)
98-L92	Exercise problems: Chapter 4(8)
99-L93	Exercise problems: Chapter 4(9)
100-L94	Exercise problems: Chapter 4(10)
101-L95	Exercise problems: Chapter 4(11)
102-L96	Problems
103-L97	Problems
104-L98	Problems
105-L99	Problems
106-L100	Problems
107-L101	Problems
108-L102	Problems
109- L103	**Allotting portion for Internal Test-III**
	Internal Test III begins(23-03-2017)
110- L104	Revision
111- L105	Revision
112-IT-III	**Internal Test-III**
113- L106	Revision
114- L107	**Test Paper distribution and result analysis**
115- L108	Revision
	Entering Internal Test-III Marks into University portal
116-MT	**Model Test (05-04-2017)**
117-MT	**Model Test**
118-MT	**Model Test**
119-L109	**Model test paper distribution and previous year university question paper discussion**
120-L110	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course “Analytic Number Theory”
CO1	Knowledge gained about the fundamental Theorem of Arithmetic
CO2	Acquisition of knowledge about Arithmetic functions, Multiplicative functions and Dirichlet Multiplication.

CO3	Students will gain knowledge about Averages of Arithmetical functions, Partial sums of Dirichlet product and Chebyshev'sfunctions .

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Practical-Programming with C++ and M.S-Office
Course Code	**KMAE12**
Class	I year (2016-2017)
Semester	Even
Staff Name	Mr. K. Stalin Alexis
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the exiting world of programming to the students
- To train the students to run simple C programmes

Syllabus

Text: Object Oriented Programming with CH (Fourth Edition), E. Balagurusamy-TMH Publications. Programming Exercises 5.2, 5.5,6.2 and 7.4, 7.3.7.5, 9.1 and 9.2. 10.3 and 11.1, 11.3 and 11.2.
Ms-Office

Features in word:
1. Creating a Document 2. Formatting a Document 3. Adding Headers and Footers 4. Table creation and Manipulation 5. Entering and editing Formulas and Symbols 6. Inserting a Graphics to a document 7. Mail Merge

Features in Excel:
1. Entering and Editing Formulas 2. Graphs and Charts 3. Simple calculations using Mathematical Statistical/ Logical functions 4. Cell formatting 5. Sorting 6. Inserting Images

Features in Power Point: 1. Creating a simple presentation 2. Adding Transition effects to a presentation 3. Adding Animation effects to a presentation 4. Adding sound effect to a presentation 5. Creating Hyperlinks between slides 6. Changing the background 7. Inserting Images

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 01-12-2016
1-L1	MS Office-Introduction
2-L2	**Features in word**
3- L3	Creating a Document
4-L4	Formatting a Document
5-L5	Formatting a Document
6-L6	Lab
7-L7	Adding Headers and Footers
8-L8	Adding Headers and Footers
9-L9	Table creation and Manipulation
10-P1	**Inauguration of Mathematics Association**
11-L10	Table creation and Manipulation
12-L11	Lab
13-L12	Entering and editing Formulas and Symbols
14-L13	Entering and editing Formulas and Symbols
15-L14	Lab
16-L15	Inserting a Graphics to a document
17-L16	Inserting a Graphics to a document
18-L17	Mail Merge
19-L18	Mail Merge
20-L19	Lab
21-L20	**Features in Excel**
22-L21	Entering and Editing Formulas
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins on 24-01-2017
24-L23	Entering and Editing Formulas
25-L24	Graphs and Charts
26-IT-1	**Internal Test-I**
27-L25	Graphs and Charts
28-L26	Lab
29-L27	Simple calculations using Mathematical Statistical/ Logical functions
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Simple calculations using Mathematical Statistical/ Logical functions
32- L30	Simple calculations using Mathematical Statistical/ Logical functions
33- L31	Simple calculations using Mathematical Statistical/ Logical functions
34-P2	**College level meeting/Cell function**
35- L32	Lab
36- L33	Cell formatting
37- L34	Cell formatting
38- L35	Sorting

39- L36	Sorting
40- L37	Inserting Images
41- L38	Inserting Images
42- L39	Lab
43- L40	**Features in Power Point**
44- L41	Creating a simple presentation
45- L42	Creating a simple presentation
46- L43	Lab
47- L44	Adding Transition effects to a presentation
48- L45	Adding Transition effects to a presentation
49- L46	Adding Transition effects to a presentation
50- L47	Lab
51- P3	**Department Seminar**
52- L48	Adding Animation effects to a presentation
53- L49	Adding Animation effects to a presentation
54- L50	Adding Animation effects to a presentation
55- L51	Lab
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins 0n 24-02-2017
57-L53	Adding sound effect to a presentation
58-L54	Adding sound effect to a presentation
59-IT-II	**Internal Test-II**
60- L55	Lab
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Creating Hyperlinks between slides
63- L58	Creating Hyperlinks between slides
64- L59	Creating Hyperlinks between slides
65- L60	Lab
66- L61	Changing the background
67- L62	Changing the background
68- L63	Changing the background
69- L64	Lab
70- L65	Inserting Images
71- L66	Inserting Images
72- L67	Inserting Images
73- L68	Lab
74-P4	**College level meeting/ function**
75- L69	Lab
76- L70	Model Practical
77- L71	Model Practical
78- L72	Model Practical
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins 23-03-2017
80- L74	Lab
81- L75	Lab
82-IT-III	**Internal Test-III**
83- L76	Lab

84- L77	**Test Paper distribution and result analysis**
85- L78	Lab
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test begins on 5-4-2017**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Practical-Programming with C++ and M.S-Office C++"
CO1	Enable the students to develop a C++ program for a given problem.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Ordinary Differential Equation
Course Code	**KMAM14**
Class	I year (2016-2017)
Semester	Even
Staff Name	Mr.V.Selvan
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 01-12-2016
1-L1	Introduction
2-L2	Second Order linear equations
3- L3	General solution of the Homogeneous equations
4-L4	General solution of the Homogeneous equations
5-L5	General solution of the Homogeneous equations
6-L6	The use of a known solution to find another
7-L7	The use of a known solution to find another
8-L8	The use of a known solution to find another
9-L9	The method of variation of parameters
10-P1	**Inauguration of Mathematics Association**
11-L10	The method of variation of parameters
12-L11	The method of variation of parameters
13-L12	The method of variation of parameters
14-L13	Power series solutions
15-L14	Power series solutions
16-L15	A review of power series solutions
17-L16	A review of power series solutions
18-L17	A review of power series solutions
19-L18	Series solution of first order equations
20-L19	Series solution of first order equations
21-L20	Series solution of first order equations
22-L21	Series solution of first order equations
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins on 24-01-2017
24-L23	Second order equations
25-L24	Second order equations
26-IT-1	**Internal Test-I**
27-L25	Second order equations
28-L26	Ordinary points
29-L27	Ordinary points
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Ordinary points
32- L30	Regular singular points
33- L31	Regular singular points
34-P2	**College level meeting/Cell function**

35- L32	Regular singular points
36- L33	Regular singular points
37- L34	Legendre polynomials
38- L35	Legendre polynomials
39- L36	Legendre polynomials
40- L37	Properties of Legendre Polynomials
41- L38	Properties of Legendre Polynomials
42- L39	Properties of Legendre Polynomials
43- L40	Bessel functions
44- L41	Bessel functions
45- L42	Bessel functions
46- L43	Bessel functions
47- L44	The Gamma functions
48- L45	The Gamma functions
49- L46	The Gamma functions
50- L47	The Gamma functions
51- P3	**Department Seminar**
52- L48	Properties of Bessel functions
53- L49	Properties of Bessel functions
54- L50	Properties of Bessel functions
55- L51	Properties of Bessel functions
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins 0n 24-02-2017
57-L53	Linear systems
58-L54	Linear systems
59-IT-II	**Internal Test-II**
60- L55	Linear systems
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Linear systems
63- L58	Linear systems
64- L59	Problems
65- L60	Problems
66- L61	Problems
67- L62	Problems
68- L63	Homogeneous linear systems with constant coefficients
69- L64	Homogeneous linear systems with constant coefficients
70- L65	Homogeneous linear systems with constant coefficients
71- L66	Homogeneous linear systems with constant coefficients
72- L67	Homogeneous linear systems with constant coefficients
73- L68	Homogeneous linear systems with constant coefficients
74-P4	**College level meeting/ function**
75- L69	Homogeneous linear systems with constant coefficients
76- L70	Homogeneous linear systems with constant coefficients
77- L71	Homogeneous linear systems with constant coefficients
78- L72	Problem discussion
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins 23-03-2017

80- L74	Problem discussion
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test begins on 5-4-2017**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Ordinary Differential Equation''
CO1	Knowledge gained about Second Order linear equations and Power series solutions.
CO2	Acquisition of knowledge about Legendre polynomials, Bessel functions, The Gamma functions and Linear systems.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Algebra II
Course Code	**KMAM21**
Class	I year (2016-2017)
Semester	Even
Staff Name	Dr. G. S. Grace Prema
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

Tex Book: Topics in Algebra, Second Edition, I.N.Herstein, Willey India Edition.

Unit 1: Algebra of linear transformations-characteristic roots. (Sections 6.1 and 6.2) Problems: Section 6.1(1 to 7, 10 to 13 and 17 to 21), Section 6.2(1 to 8)

Unit 2: Canonical forms: Triangular Forms-Nilpotent Transformations. (Sections 6.4 and 6.5) Problems: Section 6.4(1 to 6)

Unit 3: Trace and Transpose-Hermitian. Unitary and Normal transformations (Sections 6.8 and 6.10) Problems: Section 6.8(1 to 14). Section 6.10(1 to 12, 19 to 21)

Unit 4: Extension fields-roots of polynomials (Sections 5.1 and 5.3) Problems: Section 5.1(1 to 15) and Section 5.3(1 to 7)

Unit 5: More about roots-Finite fields. (Sections 5.5 and 7.1) Problems: Section 5.5(1 to 3) and Section 7.1(1 to 7)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 01-12-2016
1-L1	Introduction
2-L2	Algebra of linear transformations
3- L3	Algebra of linear transformations
4-L4	Algebra of linear transformations
5-L5	Algebra of linear transformations
6-L6	characteristic roots
7-L7	characteristic roots
8-L8	characteristic roots
9-L9	characteristic roots
10-P1	**Inauguration of Mathematics Association**
11-L10	Problems: Section 6.1(1 to 3)
12-L11	Problems: Section 6.1(4 to 7)
13-L12	Problems: Section 6.1(10 to 13)
14-L13	Problems: Section 6.1(10 to 13)
15-L14	Problems: Section 6.1(17 to 21)
16-L15	Problems: Section 6.1(17to 21)
17-L16	Problems: Section 6.2(1 to 4)
18-L17	Problems: Section 6.2(5 to 8)
19-L18	Canonical forms
20-L19	Canonical forms
21-L20	Canonical forms
22-L21	Triangular Forms
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins24-01-2017
24-L23	Triangular Forms
25-L24	Triangular Forms
26-IT-1	**Internal Test-I**
27-L25	Nilpotent Transformations
28-L26	Nilpotent Transformations
29-L27	Nilpotent Transformations
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Problems: Section 6.4(1 to 3)
32- L30	Problems: Section 6.4(4 to 6)
33- L31	Trace and Transpose
34-P2	**College level meeting/Cell function**
35- L32	Trace and Transpose
36- L33	Trace and Transpose
37- L34	Trace and Transpose
38- L35	Hermitian
39- L36	Hermitian
40- L37	Hermitian
41- L38	Unitary and Normal transformations
42- L39	Unitary and Normal transformations
43- L40	Unitary and Normal transformations

44- L41	Problems: Section 6.8(1 to 4)
45- L42	Problems: Section 6.8(5 to 9)
46- L43	Problems: Section 6.8(10 to 14)
47- L44	Problems: Section 6.10(1 to 4)
48- L45	Problems: Section 6.10(5 to 8)
49- L46	Problems: Section 6.10(9 to 12)
50- L47	Problems: Section 6.10(19 to 21)
51- P3	**Department Seminar**
52- L48	Extension fields
53- L49	Extension fields
54- L50	roots of polynomials
55- L51	roots of polynomials
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins24-02-2017
57-L53	Problems: Section 5.1(1 to 4)
58-L54	Problems: Section 5.1(5 to 9)
59-IT-II	**Internal Test-II**
60- L55	Problems: Section 5.1(10 to 13)
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems: Section 5.1(14 to 15)
63- L58	Problems: Section 5.3(1 to 4)
64- L59	Problems :Section 5.3(5 to 7)
65- L60	More about roots
66- L61	More about roots
67- L62	More about roots
68- L63	More about roots
69- L64	More about roots
70- L65	Finite fields
71- L66	Finite fields
72- L67	Finite fields
73- L68	Finite fields
74-P4	**College level meeting/ function**
75- L69	Finite fields
76- L70	Problems: Section 5.5(1 to 3)
77- L71	Problems: Section 7.1(1 to 4)
78- L72	Problems: Section 7.1(5 to 7)
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins23-03-2017
80- L74	Problems Discussion
81- L75	Problems Discussion
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Testbegins on 5-4-2017**
87-MT	**Model Test**

88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course “<Algebra II>”
CO1	Knowledge gained about Ring Homomorphisms.
CO2	Acquisition of knowledge about Euclidean rings, Polynomial rings, Certain radicals of a ring, Jacobson radical of a ring and Semi simple ring.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis II
Course Code	**KMAM22**
Class	I year (2016-2017)
Semester	Even
Staff Name	Dr. J. Suresh Suseela
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

Text: Principles of Mathematical Analysis, Third Edition, Walter Rudin-Mcgraw-Hill International Book Company.

Unit 1: Definition and Properties of Integral-Integration and Differentiation. (Section 6.1 to 6.22) Exercise Problems: Chapter 6(1 to 6 and 10 to 14)

Unit 2: Integration of vector valued functions - Rectifiable ares, Sequence and series of functions: Discussion of main problem-Uniform ConvergenceUniform convergence and continuity. (Section 6.23 to 6.27 and 7.1 to 7.15) Exercise Problems: Chapter 6(15 to 17) and Chapter 7(1 to 9)

Unit 3: Uniform Convergence and Integration- Uniform Convergence and Differentiation- Equicontinuous families of functions-The Stone Weierstrass theorem. (Section 7.16 to 7.33) Exercise Problems: Chapter 7(20 to 24)

Unit 4: Power series-The exponential, logarithmic and trigonometrical functions (Section 8.1 to 8.7) Exercise Problems: Chapter 8(1 to 8)

Unit 5: The algebraic completeness of the complex field-Fourier series-The Gamma function (Section 8.8 to 8.22) Exercise Problems: Chapter 8(12 to 16)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 01-12-2016
1-L1	Introduction
2-L2	Definition and Properties of Integral
3- L3	Definition and Properties of Integral
4-L4	Definition and Properties of Integral
5-L5	Definition and Properties of Integral
6-L6	Integration and Differentiation
7-L7	Integration and Differentiation
8-L8	Integration and Differentiation
9-L9	Integration and Differentiation
10-P1	**Inauguration of Mathematics Association**
11-L10	Exercise Problems: Chapter 6(1 to 3)
12-L11	Exercise Problems: Chapter 6(4 to6)
13-L12	Exercise Problems: Chapter 6(10 to 14)
14-L13	Integration of vector valued functions
15-L14	Integration of vector valued functions
16-L15	Integration of vector valued functions
17-L16	Rectifiable arcs
18-L17	Rectifiable arcs
19-L18	Sequence and series of functions
20-L19	Sequence and series of functions
21-L20	Discussion of main problem
22-L21	Discussion of main problem
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins 24-01-2017
24-L23	Uniform convergence and continuity
25-L24	Uniform convergence and continuity
26-IT-1	**Internal Test-I**
27-L25	Uniform convergence and continuity
28-L26	Exercise Problems: Chapter 6(15 to 17)
29-L27	Exercise Problems: Chapter 7(1 to 4)
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Exercise Problems: Chapter 7(5 to 9)
32- L30	Uniform Convergence and Integration
33- L31	Uniform Convergence and Integration
34-P2	**College level meeting/Cell function**
35- L32	Uniform Convergence and Differentiation
36- L33	Uniform Convergence and Differentiation
37- L34	Equicontinuous families of functions
38- L35	Equicontinuous families of functions
39- L36	Equicontinuous families of functions
40- L37	The Stone Weierstrass theorem
41- L38	The Stone Weierstrass theorem

42- L39	Exercise Problems: Chapter 7(20 to 24)
43- L40	Power series
44- L41	The exponential
45- L42	The exponential
46- L43	logarithmic and trigonometrical functions
47- L44	logarithmic and trigonometrical functions
48- L45	logarithmic and trigonometrical functions
49- L46	logarithmic and trigonometrical functions
50- L47	logarithmic and trigonometrical functions
51- P3	**Department Seminar**
52- L48	Exercise Problems: Chapter 8(1 to 4)
53- L49	Exercise Problems: Chapter 8(5 to 8)
54- L50	The algebraic completeness of the complex field
55- L51	The algebraic completeness of the complex field
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins 0n 24-02-2017
57-L53	The algebraic completeness of the complex field
58-L54	The algebraic completeness of the complex field
59-IT-II	**Internal Test-II**
60- L55	The algebraic completeness of the complex field
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Fourier series
63- L58	Fourier series
64- L59	Fourier series
65- L60	Fourier series
66- L61	Fourier series
67- L62	The Gamma function
68- L63	The Gamma function
69- L64	The Gamma function
70- L65	The Gamma function
71- L66	The Gamma function
72- L67	Exercise Problems: Chapter 8(12 to 14)
73- L68	Exercise Problems: Chapter 8(15,16)
74-P4	**College level meeting/ function**
75- L69	Problems
76- L70	Problems
77- L71	Problems
78- L72	Problems
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins 23-03-2017
80- L74	Problem Discussion
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal

86- L79	**Model Test begins on 5-4-2017**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21-04-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Analysis II"
CO1	Knowledge gained about Integration of vector valued functions.
CO2	Knowledge gained about The Stone Weierstrass Theorem, Fourier Series and The Gamma function.
CO3	Acquisition of knowledge about Uniform Convergence, Uniform Convergence and Continuity, Uniform Convergence and Integration, Uniform Convergence and Differentiation.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Classical Mechanics
Course Code	**KMAM23**
Class	I year (2016-2017)
Semester	Even
Staff Name	Dr. A. Alwyn Asir
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To study mechanical systems under generalized coordinate systems, virtual work, energy and momentum
- To study mechanics developed by Newton, Langrange, Hamilton and Jacobi

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begins on 01.12.2016
1-L1	Unit I – Introduction: Mechanics of a single particle
2-L2	Conservation theorem for linear momentum of a single particle
3- L3	Conservation theorem for angular momentum of a single particle
4-L4	Some remarks on conservation theorems
5-L5	Energy conservation theorem
6-L6	Problem discussion on mechanics of a single particle
7-L7	Mechanics of a system of particles
8- P1	**Inauguration of Mathematics Association**
9- L8	Conservation theorem for linear momentum of a system of particles
10- L9	Conservation theorem for angular momentum of a system of particles
11-L10	Theorems on Kinetic energy
12-L11	Problem discussion on Kinetic energy
13-L12	Energy conservation theorem
14-L13	Exercise problems using conservation theorem
15-L14	Unit II – Constraints: Different types of constraints
16-L15	Examples for holonomic constraints and non-holonomic constraints
17- L16	Virtual work and D'Alembert's Principle
18- L17	Lagrange's equation from D'Alembert's Principle – Theorem
19- L18	Lagrange's equation for non-holonomic constraints

20- L19	Velocity dependent potentials
21- L20	Rayleigh Dissipation function –**Allotting portion for Internal Test-I**
	Internal Test I begins 24-01-2017
22- L21	Lagrangian for charged particle and some problems
23- IT-1	**Internal Test-I**
24- L22	Applications of the Lagrangian equation
25- L23	Lagrangian for a single particle (i) in cartesian coordinates (ii) in polar coordinates
26- L24	Lagrangian for Atwood machine - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Time dependent potential
28- L26	Problem - bead sliding on rotating wire and some exercise problems
29- L27	Unit III – Variation principles and lagrange’s equation - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Hamilton’s principle
32-L29	Stationary values
33-L30	Path of a system – congugration
34- L31	Path of a system – congugration
35- L32	Techniques of calculus of variation - theorem
36- L33	Lagrange’s equation from Hamilton’s principle
37- L34	Shortest distance between two point in a space
38- L35	Minimum surface of revolution
39- L36	Brachistochrone problem
40- L37	Extension of Hanilton’s Principle
41- L38	Extension of Hanilton’s Principle non-holonomic system
42-P3	**Department Seminar**
43- L39	Unit IV –Two body central force problem
44- L40	Reduction to one body problem
45- L41	The equations of motion and first integral theorem
46- L42	The Kepler’s Second law of planetary motion
47- L43	Derivatives - **Allotting portion for Internal Test-II**
	Internal Test II begins 24-02-2017
48- L44	Illustrations about derivative and motion
49-IT-II	**Internal Test-II**
50-L45	The equivalent one dimensional problems
51- L46	Classification of orbits - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Examples of the method occurs for a linear restoring force
53- L48	Inverse square law for circular orbits
54- L49	The virial theorem.
55- L50	Problem discussion based on the virial’s theorem
56- L51	Unit V – The differential equation for the orbit

57- L52	Problems on differential equation for the orbit
58- L53	Integrable power-law potentials
59-P4	**College level meeting/ function**
60- L54	The Kepler problem
61- L55	Inverse square law of force
62- L56	Nature of the orbit depends on *e* and *E*
63- L57	The motion in time in the Kepler problem
64- L58	Deriving the approximate version of the Kepler's third law – **Allotting portion for Internal Test-III**
	Internal Test III begins 23-03-2017
65- L59	Existence of conserved vector **A** for the Kepler problem
66- L60	The Laplace-Runge-Lenz vector
67-IT-III	**Internal Test-III**
68- L61	Problem discussion
69- L62	Scattering in a central force field
70- L63	Relation of orbit parameters and scattering angle - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins
71-MT	**Model Test 5-4-2017**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21.04.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Classical Mechanics"
CO1	Able to understand D' Alembert's Principle and simple applications of the Lagrangian Formulation.
CO2	Able to analyze the Derivation of Lagrange's Equations from Hamilton's Principle and Extension of Hamilton's Principle to Non-holonomic Systems
CO3	Able to study the concept of the Equations of Motion and the Equivalent One-Dimensional Problems.
CO4	Able to understand the Kepler Problem and Inverse-Square Law of Force.
CO5	Able to distinguish the concept of the Hamilton Equations of Motion and the Principle of Least Action.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

S. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Complex Analysis
Course Code	**HMAM31**
Class	II year (2016-2017)
Semester	Odd
Staff Name	Dr. Mr. J. Vijaya Xavier Parthban
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To gain advanced knowledge about Complex functions and Analytic functions as mappings.

Syllabus

Text: Complex Analysis-Lars V. Ahlfors-Tata McGraw Hill(Third Edition)

Unit 1: Analytic functions-Polynomials-Power series. (Chapter 2: Section 1.1 to 2.5) Problems: Section 1.2(1 to 7), Section 1.4(1 to 6). Section 2.2(1 to 5) and Section 2.4(1 to 4)

Unit 2: Exponential and Trigonometric functions Arcs and closed curves=-Analytic functions in regions-Conformal mapping-Linear transformations-Symmetry (Chapter 2: Section 3.1 to 3.4 and Chapter 3: Section 2.1 to 3.3) Problems: Chapter 2- Section 3.2(1 to 4) and Chapter 3- Section 3.1(1 to 4). Section 3.2(1 to 3). Section 3.3(1 to 7)

Unit 3. Oriented circles-Families of circles-Line integrals, Rectifiable arcLine integrals as functions of arcs-Cauchy's theorem for a rectangleCauchy's theorem in a disc. (Chapter 3: Section 3.4.3.5 and Chapter 4: Section 1.1 to 1.5) Problems: Chapter 3- Section 3.5(1 to 6) and Chapter 4- Section 1.3(1 to 7)

Unit 4: Cauchy's integral formula: Index of a point-the integral formulaHigher derivatives-Taylor's theorem-Zeroes and Poles-the local mapping (Chapter 4: Section 2.1 to 3.3) Problems: Chapter 4- Section 2.2(1 to3), Section 2.3(1) and Section 3.2(1to 4)

Unit 5: The maximum principle-Calculus of Residues-The argument principle-Evaluation of definite integrals. (Chapter 4: Section 3.4 and 5.1 to 5.3) Problems: Chapter 4. Section 3.4(1 and 2). Section 5.2(1 to 3) and Section 5.3 (1 to 3)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-06-2016
1-L1	Unit-I Introduction
2-L2	Analytic functions
3- L3	Analytic functions
4-L4	Polynomials
5-L5	Polynomials
6-L6	Power series
7-L7	Power series
8-L8	Problems: Section 1.2(1 to 4)
9-L9	Problems: Section 1.2(3 to 7)
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Problems: Section 1.4(1 to 6)
12-L11	Problems: Section 2.2(1 to 5)
13-L12	Problems: Section 2.4(1 to 4)
14-L13	Unit-II Introduction
15-L14	Exponential functions
16-L15	Exponential functions
17-L16	Trigonometric functions
18-L17	Trigonometric functions
19-L18	Arcs and closed curves
20-L19	Arcs and closed curves
21-L20	Analytic functions in regions
22-L21	Analytic functions in regions
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins(25-07-2016)
24-L23	Conformal mapping
25-L24	Conformal mapping
26-IT-1	**Internal Test-I**
27-L25	Linear transformations
28-L26	Linear transformations
29-L27	Symmetry
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Symmetry
32- L30	Problems: Chapter 2- Section 3.2(1 to 4)
33- L31	Problems: Chapter 3- Section 3.1(1 to 4)
34-P2	**College level meeting/Cell function**
35- L32	Problems: Chapter 2- Section 3.2(1 to 3)
36- L33	Problems: Chapter 2- Section 3.3(1 to 7)
37- L34	Unit-III Introduction
38- L35	Oriented circles

39- L36	Families of circles
40- L37	Line integrals
41- L38	Rectifiable arc
42- L39	Line integrals as functions of arcs
43- L40	Cauchy's theorem for a rectangle
44- L41	Cauchy's theorem in a disc
45- L42	Problems: Chapter 3- Section 3.5(1 to 6)
46- L43	Problems: Chapter 4- Section 1.3(1 to 7)
47- L44	Unit-IV Introduction
48- L45	Cauchy's integral formula
49- L46	Index of a point
50- L47	the integral formula-
51- P3	**Department Seminar**
52- L48	Higher derivatives
53- L49	Taylor's theorem
54- L50	Zeroes and Poles
55- L51	the local mapping
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(22-08-2016)
57-L53	Problems: Chapter 4- Section 2.2(1 to3)&Section 2.3(1)
58-L54	Problems: Chapter 4- Section 3.2(1to 4)
59-IT-II	**Internal Test-II**
60- L55	Problems
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Unit-V Introduction
63- L58	The maximum principle
64- L59	Calculus of Residues
65- L60	Calculus of Residues
66- L61	Calculus of Residues
67- L62	The argument principle
68- L63	The argument principle
69- L64	The argument principle
70- L65	The argument principle
71- L66	Evaluation of definite integrals
72- L67	Evaluation of definite integrals
73- L68	Evaluation of definite integrals
74-P4	**College level meeting/ function**
75- L69	Problems: Chapter 4. Section 3.4(1 and 2)
76- L70	Problems: Chapter 4. Section 5.2(1 to 3)
77- L71	Problems: Chapter 4. Section 5.3 (1 to 3)
78- L72	Problems
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins(03-10-2016)
80- L74	Revision
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision

84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (17-10-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-11-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Complex analysis"
CO1	To gain advanced knowledge about Complex functions and Analytic functions as mappings
CO2	To understand the concept of Analyticity Conformality, Linear Transformation and Complex Integration.
CO3	Acquisition of solving problems in Complex Integration and boundary value problems.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Topology
Course Code	**HMAM32**
Class	II year (2016-2017)
Semester	Odd
Staff Name	Dr. Mrs. Suresh Suseela
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To distinguish space by means of Simple Topological invariants.
- To get the Knowledge about Topological Spaces and the theories based on these Spaces.

Syllabus

Text: Topology (Second Edition) James R. Munkres, Printice-Hall of India Private Limited

Unit 1: Topological spaces-closed sets and limit points. (Chapter 2: Section 12 to 17)

Problems: Section 13(all exercise problems), Section 16(1 to 6) and Section 17

(1 to 15)

Unit 2: Continuous functions-Product topology-Quotient topology. (Chapter 2: Section 18, 19 and 22) Problems: Section 18(1 to 8), Section 19(1 to 9) and Section 22(1 to 5)

Unit 3: Connected spaces-Compact spaces. (Chapter 3: Section 23 and 26) Problems: Section 23(1 to 6) and Section 26(1 to 9)

Unit 4: The Countability Axioms - The separation Axioms-Normal spaces. (Chapter 4: Section 30 to 32) Problems: Section 30(1 to 5), Section 31(1 to 7) and Section 32(1 to 7)

Unit 5: The Urysohn Lemma-The UrysohnMetrization Theorem-The Tietze Extension Theorem (Chapter 4: Section 33 to 35) Problems: Section 331 to 5) and Section 35(1 to 4)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-06-2016
1-L1	Introduction
2-L2	Topological spaces
3- L3	Topological spaces
4-L4	Topological spaces
5-L5	Topological spaces
6-L6	Topological spaces
7-L7	closed sets and limit points
8-L8	closed sets and limit points
9-L9	closed sets and limit points
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Problems: Section 13(all exercise problems)
12-L11	Problems: Section 13(all exercise problems)
13-L12	Continuous functions-Product topology
14-L13	Continuous functions-Product topology
15-L14	Continuous functions-Product topology
16-L15	Quotient topology
17-L16	Quotient topology
18-L17	Quotient topology
19-L18	Quotient topology
20-L19	Problems: Section 18(1 to 4)
21-L20	Problems: Section 18(5 to 8)
22-L21	Problems: Section 19(1 to 4)
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins(25-07-2016)
24-L23	Problems: Section 22(1 to 5)
25-L24	Problems: Section 18(5 to 8)
26-IT-1	**Internal Test-I**
27-L25	Connected spaces
28-L26	Connected spaces
29-L27	Connected spaces
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Compact spaces
32- L30	Compact spaces
33- L31	Compact spaces
34-P2	**College level meeting/Cell function**
35- L32	Compact spaces
36- L33	Compact spaces
37- L34	Problems: Section 23(1 to 3)
38- L35	Problems: Section 23(4 to 6)
39- L36	Problems: Section 26(1 to 4)

40- L37	Problems: Section 26(5 to 9)
41- L38	The Countability Axioms
42- L39	The Countability Axioms
43- L40	The Countability Axioms
44- L41	The Countability Axioms
45- L42	The Countability Axioms
46- L43	The separation Axioms
47- L44	The separation Axioms
48- L45	The separation Axioms
49- L46	The separation Axioms
50- L47	Normal spaces
51- P3	**Department Seminar**
52- L48	Normal spaces
53- L49	Normal spaces
54- L50	Normal spaces
55- L51	Normal spaces
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(22-08-2016)
57-L53	Problems: Section 30(1 to 3)
58-L54	Problems: Section 30(4, 5)
59-IT-II	**Internal Test-II**
60- L55	Problems: Section 31(1 to 4)
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems: Section 31(5 to 7)
63- L58	Problems: Section 32(1 to 4)
64- L59	Problems: Section 32(5 to 7)
65- L60	The Urysohn Lemma
66- L61	The Urysohn Lemma
67- L62	The Urysohn Lemma
68- L63	The Urysohn Lemma
69- L64	The UrysohnMetrization Theorem
70- L65	The UrysohnMetrization Theorem
71- L66	The UrysohnMetrization Theorem
72- L67	The Tietze Extension Theorem
73- L68	The Tietze Extension Theorem
74-P4	**College level meeting/ function**
75- L69	The Tietze Extension Theorem
76- L70	The Tietze Extension Theorem
77- L71	Problems: Section 33(1 to 3)
78- L72	Problems: Section 33(4, 5)
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins(03-10-2016)
80- L74	Problems: Section 35(1 ,2)
81- L75	Problems: Section 35(3, 4)
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**

85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (17-10-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-10-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Topology"
CO1	To distinguish space by means of Simple Topological invariants.
CO2	Gain the knowledge of constructing spaces by giving and to prove that in certain case, that the result is homeomorphic to standard spaces.
CO3	Knowledge gained about Topological Spaces and the theories based on these Spaces.
CO4	Basic knowledge in Set Theory and Analysis at undergraduate level.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Differential Geometry
Course Code	**HMAM33**
Class	II year (2016-2017)
Semester	Odd
Staff Name	Mrs. W. Rajammal Ranjitha Mary
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To be able to understand the fundamental theorem for plane curves
- To understand fundamental abstract topological structures
- To improve problem solving skills
- To introduce essential ideas and methods of differential geometry

Syllabus

DIFFERENTIAL GEOMETRY

Unit I: The theory of space curves – Definitions , Arc length – Tangent – Normal and Binormal – Curvature and Torsion.

Unit II: Contact between curves and surfaces – Tangent Surface – Involutes and evolutes –

Helices

Unit III: Definition of a surface – Curves on a surface – Helicoids – Metric –

Direction

Coefficients.

Unit IV: Families of curves – Geodesics , Canonical geodesic equation,

Normal Property of

geodesics (Christoffel symbols not included).

Unit V: Geodesic curvature , The Second Fundamental form – Principal

Curvature – Lines of

Curvature (Dupin's indicatrix not included).

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 16-06-2016
1-L1	UNIT I - THE THEORY OF SPACE CURVES- Introduction of Space curves
2-L2	Definitions of space curves
3- L3	Arc Length
4-L4	Problems on Arc Length
5-L5	Tangent – unit tangent vector
6-L6	Osculating plane
7-L7	Problems on Osculating plane
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Normal - Unit normal vector –Normal plane
10- L9	Theorems on Osculating plane and Normal plane
11-L10	Curvatures of a curve
12-L11	Behaviour of a curve in the neighbourhood of a point on it.
13-L12	Torsion of a curve
14-L13	Curvature &torsion of a curve given as the intersection of two surfaces.
15-L14	UNITII: CONTACT BETWEEN CURVES AND SURFACES - Introduction
16-L15	Osculating Circle and Osculating Sphere
17- L16	Locus of centre of Spherical curvature
18- L17	Tangent surface of a curves
19- L18	Involutes of a curve
20- L19	Evolutes of a curve
21- L20	Helices - **Allotting portion for Internal Test-I**
	Internal Test I begins on 25-07-2016
22- L21	To find the equation of the Involutes
23- IT-1	**Internal Test-I**
24- L22	To find the equation of the Evolutes

25- L23	Definition of circular helices and cylindrical helices
26- L24	Characteristic property of Helices-**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Circular helix and Cylindrical helix
28- L26	Relation between the curvatures of a general helix and its projection on a plane orthogonal to its axis
29- L27	**UNIT III:** DEFINITION OF A SURFACE - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Definition of a curve on a surface
32-L29	Definition Of Parametric Equations – Proper Transformation
33-L30	Equivalent relations of two surfaces
34- L31	Curves on surface
35- L32	Parametric curves and orthogonal to each other
36- L33	Definitions of a Helicoids
37- L34	Right helicoids and General helicoids
38-L35	Definition of Metric
39- L36	Problems on Metric
40- L37	Angle between Parametric curves
41- L38	Elements of area
42-P3	**Department Seminar**
43- L39	Direction coefficients
44- L40	UNIT IV- FAMILIES OF CURVES – Introduction
45- L41	General significance of the sense of the tangent vector
46- L42	Orthogonal trajectories
47- L43	Discuss about the Orthogonal trajectories **Allotting portion for Internal Test-II**
	Internal Test II begins on 22-08-2016
48- L44	Problems on Orthogonal trajectories
49-IT-II	**Internal Test-II**
50-L45	Double family of curves
51- L46	Geodesics - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Derivation of equations to Geodesics
53- L48	Problems on Geodesics
54- L49	Problems on Geodesics
55- L50	Canonical geodesics equations
56- L51	Normal property of Geodesics
57- L52	Equivalent statement of the normal property
58- L53	UNIT V- GEODESIC CURVATURE-Introduction
59-P4	**College level meeting/ function**
60- L54	Examples on Geodesic curvature
61- L55	Problems onGeodesic curvature
62- L56	Second Fundamental form
63- L57	Mensniersthrorem
64- L58	Principal Curvature- **Allotting portion for Internal Test-III**
	Internal Test III begins on 03-10-2016
65- L59	Lines of Curvature Rodrigue’s formula
66- L60	Euler’s theorem

67-IT-III	**Internal Test-III**
68- L61	Liouville’s formula
69- L62	Geometrical interpretation of the second fundamental form
70- L63	Classification of point on a surface - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (17-10-2016)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-10-2016

Course Outcomes

Learning Outcomes	**COs** of the course “Differential Geometry”
CO1	Appreciation and understanding of what makes properties and arguments geometric
CO2	Understanding between intrinsic and extrinsic properties
CO3	Define the equivalence of two curves
CO4	Define surfaces and their properties
CO5	Express tangent spaces of surfaces
Integrated Activity	
IA1	Rigorous treatment to the concepts and methods of differential geometry via the classical theory of curves and surfaces in Euclidean space
IA2	Able to understand the classical theory of curves and surfaces

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Operations Research
Course Code	**HMAM34**
Class	II year (2016-2017)
Semester	Odd
Staff Name	Dr. Mrs. J. Suresh Suseela
Credits	5
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To determine real life into Standard Mathematical Models
- To get Basic computing knowledge and techniques at undergraduate level.

Syllabus

Text: Operations Research Principles and Applications-G.Srinivasan-PHI learning private limited-New Delhi-EEE edition.

Unit 1: Integer Programming.(Chapter 7 and all exercise problems)

Unit 2: Network Problems-Minimum spanning tree problem-The shortest path problem-The maximum flow problem-The minimum cost problem.

(Chapter 8: Section 8.5 to 8.9 and all exercise problems)

Unit 3: Travelling salesman and distribution problem. (Chapter 9 and all exercise problems)

Unit 4: Basic Queueing models. (Chapter 11 and all exercise problems)

Unit 5: Deterministic inventory models. (Chapter 13 and all exercise problems) 3.5. Paper-14-Project

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-06-2016
1-L1	Introduction
2-L2	Integer Programming
3- L3	Integer Programming
4-L4	Integer Programming
5-L5	Integer Programming
6-L6	Integer Programming
7-L7	Integer Programming
8-L8	Integer Programming
9-L9	Integer Programming
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Exercise Problems
12-L11	Exercise Problems
13-L12	Network Problems
14-L13	Network Problems
15-L14	Network Problems
16-L15	Minimum spanning tree problem
17-L16	Minimum spanning tree problem
18-L17	Minimum spanning tree problem
19-L18	Minimum spanning tree problem
20-L19	The shortest path problem
21-L20	The shortest path problem
22-L21	The shortest path problem
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins(25-07-2016)
24-L23	The shortest path problem
25-L24	The shortest path problem
26-IT-1	**Internal Test-I**
27-L25	The maximum flow problem
28-L26	The maximum flow problem
29-L27	The maximum flow problem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	The maximum flow problem
32- L30	The maximum flow problem
33- L31	The minimum cost problem
34-P2	**College level meeting/Cell function**
35- L32	The minimum cost problem
36- L33	The minimum cost problem
37- L34	The minimum cost problem
38- L35	Exercise Problems
39- L36	Exercise Problems
40- L37	Travelling salesman and distribution problem

41- L38	Travelling salesman and distribution problem
42- L39	Travelling salesman and distribution problem
43- L40	Travelling salesman and distribution problem
44- L41	Travelling salesman and distribution problem
45- L42	Travelling salesman and distribution problem
46- L43	Travelling salesman and distribution problem
47- L44	Travelling salesman and distribution problem
48- L45	Travelling salesman and distribution problem
49- L46	Travelling salesman and distribution problem
50- L47	Travelling salesman and distribution problem
51- P3	**Department Seminar**
52- L48	Exercise Problems
53- L49	Exercise Problems
54- L50	Exercise Problems
55- L51	Exercise Problems
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(22-08-2016)
57-L53	Basic Queueing models
58-L54	Basic Queueing models
59-IT-II	**Internal Test-II**
60- L55	Basic Queueing models
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Basic Queueing models
63- L58	Basic Queueing models
64- L59	Basic Queueing models
65- L60	Basic Queueing models
66- L61	Basic Queueing models
67- L62	Basic Queueing models
68- L63	Basic Queueing models
69- L64	Basic Queueing models
70- L65	Exercise Problems
71- L66	Exercise Problems
72- L67	Exercise Problems
73- L68	Exercise Problems
74-P4	**College level meeting/ function**
75- L69	Deterministic inventory models
76- L70	Deterministic inventory models
77- L71	Deterministic inventory models
78- L72	Deterministic inventory models
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins(03-10-2016)
80- L74	Deterministic inventory models
81- L75	Exercise Problems
82-IT-III	**Internal Test-III**
83- L76	Exercise Problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Exercise Problems

	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (17-10-2016)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-10-2016

Course Outcomes

Learning Outcomes	**COs** of the course "Operations Research"
CO1	To modify real life into Standard Mathematical Models.
CO2	To know classification of different structured problems.
CO3	Basic computing knowledge and techniques at undergraduate level.
CO4	Identification of actual problems and its equivalent mathematical models.
CO5	Application to different optimization techniques in real life situations.
CO6	Knowledge gained in utilization of Optimum Resources
CO7	To learn different optimization techniques.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Programming with C++
Course Code	**KMAE11**
Class	I year (2016-2017)
Semester	Odd
Staff Name	Mr. K. Stalin Alexis
Credits	7
L. Hours /P. Hours	7 / WK
Total 105Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 95 Hrs (5 units; 5×19=95; 19Hrs /unit)	

Course Objective:

- To introduce the exiting world of programming to the students
- To train the students to run simple C programmes

Syllabus

Elective I-Programming with C++

Text: Object Oriented Programming with C++(Fourth Edition), E.Balagurusamy-TMH Publications.mming with C++

Unit 1: Beginning with CH, Tokens. Expressions and Control structures. (Chapter 2 and 3, including Debugging and Program exercises)

Unit 2: Functions in C++, Classes and objects. (Chapter 4 and 5. including Debugging and Program exercises)

Unit 3: Constructors and Destructors-Operator Over loading-Type Conversions. (Chapter 6 and 7, including Debugging and Program exercises)

Unit 4: Inheritance-Extending Classes-Pointers- Virtual Functions-Polymorphisms, Chapter 8 and 9, including Debugging and Program exercises)

Unit 5: Managing console I/O operations-Working with files. (Chapter 10 and 11, including Debugging and Program exercises)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2016
1-L1	Unit-I Introduction
2-L2	Beginning with C+
3- L3	Beginning with C+
4-L4	Beginning with C+
5-L5	Lab
6-L6	Tokens
7-L7	Tokens
8-L8	Tokens
9-L9	Lab
10-L10	Expressions
11-L11	Expressions
12-L12	Expressions
13-P1	**Welcoming of First year and Inauguration of Mathematics Association**
14-L13	Lab
15-L14	Control structures
16-L15	Control structures
17-L16	Control structures
18-L17	Lab
19-L18	Lab
20-L19	Unit-II Introduction
21-L20	Functions in C++
22-L21	Functions in C++
23-L22	Functions in C++
24-L23	Lab
25-L24	**Allotting portion for Internal Test-I**
	Internal Test I begins 25-07-2016
26-L25	Classes
27-L26	Classes
28-IT-1	**Internal Test-I**
29-L27	Classes
30-L28	Lab
31- L29	objects
32- L30	objects
33- L31	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
34- L32	Objects
35- L33	Lab
36- L33	Lab
37- L35	Unit-III Introduction
38- L36	Constructors
39- L37	Constructors
40-P2	**College level meeting/Cell function**
41- L38	Constructors
42- L39	Lab
43- L40	Destructors

44- L41	Destructors
45- L42	Destructors
46- L43	Lab
47- L44	Operator Over loading
48- L45	Operator Over loading
49- L46	Operator Over loading
50- L47	Lab
51- L48	Type Conversions
52- L49	Type Conversions
53- L50	Type Conversions
54- P3	**Department Seminar**
55- L51	Lab
56- L52	Lab
57- L53	Unit-IV Introduction
58- L54	**Allotting portion for Internal Test-II**
59- L55	**Internal Test II begins 22-08-2016**
60- L56	Inheritance
61- L57	Inheritance
62- IT-II	**Internal Test-II**
63- L58	Inheritance
64- L59	Lab
65- L60	Extending Classes
66- L61	Extending Classes
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Extending Classes
69- L64	Lab
70- L65	Pointers
71- L66	Pointers
72- L67	Pointers
73- L68	Lab
74- L69	Virtual Functions
75- L70	Virtual Functions
76- L71	Virtual Functions
77- L72	Lab
78- L73	Polymorphisms
79- L74	Polymorphisms
80- L75	Polymorphisms
81- L76	Lab
82- P4	**College level meeting/ function**
83- L77	Lab
84- L78	Unit-VIntroduction
85- L79	Managing console I/O operations
86- L80	Managing console I/O operations
87- L81	Managing console I/O operations
88- L82	Lab
89- L83	Working with files
90- L84	Working with files

91- L85	Working with files
92- L86	Lab
93- L87	Lab
94- L88	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2016
95- L89	Revision
96- IT-III	**Internal Test-III**
97- L90	Revision
98- L91	Revision
99- L92	**Test Paper distribution and result analysis**
100- L93	Revision
	Entering Internal Test-III Marks into University portal
101- MT	**Model Test begins on 17-10-2016**
102- MT	**Model Test**
103- MT	**Model Test**
104- L94	**Model test paper distribution and previous year university question paper discussion**
105- L-95	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-10-2016

Course Outcomes

Learning Outcomes	**COs** of the course "<Programming with C++>"
CO1	Students get introduced to the exiting world of programming to the students.
CO2	Train the students to run simple C programs.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Algebra-I
Course Code	**KMAM11**
Class	I year (2016-2017)
Semester	Odd
Staff Name	Dr. G. S. Grace Prema
Credits	8
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Syllabus

1.1 Paper 1-Algebra-I

Text: Topics in Algebra, Second Edition, I.N.Herstein, Willey India Edition.

Unit 1: Homomorphisms - Automorphisms - Cayley's Theorem. (Sections 2.7. 2.8 and 2.9) Problems: Section 2.7(1 to 6 and 8 to 13), Section 2.8(2 to 6) and Section 2.9(all problems)

Unit 2: Permutation groups-Another counting principle-Sylow's Theorems. (Sections 2.10.2.11 and 2.12)

Problems: Section 2.10(1 to 17), Section 2.11(5 to 19) and Section 2.12(1 to 13)

Unit 3: Direct Products-Finite Abelian Groups. (Sections 2.13 and 2.14) Problems: Section 2.13(1 to 10) and Section 2.14(1 to 12)

Unit 4: The Field of Quotients of an Integral Domain-Euclidean Rings-A Particular Euclidean Ring. (Sections 3.6, 3.7 and 3.8) Problems: Section 3.6(1 to 4). Section 3.7(1 to 8) and Section 3.8(1 to 9)

Unit 5: Polynomial Rings-Polynomials over the Rational Field-Polynomials over Commutative Rings (Sections 3.9, 3.10 and 3.11) Problems: Section 3.91 to 7), Section 3.10(1 to 5) and Section 3.11(1 to 15) (Supplementary problems are not included)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2016
1-L1	Unit-I Introduction
2-L2	Homomorphisms
3- L3	Homomorphisms
4-L4	Homomorphisms
5-L5	Automorphisms
6-L6	Automorphisms
7-L7	Automorphisms
8-L8	Cayley's Theorem
9-L9	Problems: Section 2.7(1,2)
10-L10	Problems: Section 2.7(3,4)
11-L11	Problems: Section 2.7(5,6)
12-L12	Problems: Section 2.7(8,9)
13-L13	Problems: Section 2.7(10,11,12,13)
14-L14	Problems: Section 2.8(2,3,4,5)
15-L15	Problems: Section 2.9
16-P1	**Welcoming of First year and Inauguration of Mathematics Association**
17-L16	Problems: Section 2.9
18-L17	Problems: Section 2.9
19-L18	Unit-II Introduction
20-L19	Permutation groups
21-L20	Permutation groups
22-L21	Another counting principle
23-L22	Another counting principle
24-L23	Sylow's Theorems
25-L24	Sylow's Theorems
26-L25	Sylow's Theorems
27-L26	Sylow's Theorems
28-L27	Sylow's Theorems
29-L28	**Allotting portion for Internal Test-I**
	Internal Test I begins25-07-2016
30-L29	Problems: Section 2.10(1 to 5)
31- L30	Problems: Section 2.10(6 to 10)
32- IT-1	**Internal Test-I**
33- L31	Problems: Section 2.10(11 to 14)
34- L32	Problems: Section 2.10(15 to 17)
35- L33	Problems: Section 2.11(5 to 10)
36- L34	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
37- L35	Problems: Section 2.11(11 to 15)

38- L36	Problems: Section 2.11(16 to 19)
39- L37	Problems: Section 2.12(1 to 4)
40- P2	**College level meeting/Cell function**
41- L38	Problems: Section 2.12(5 to 8)
42- L39	Problems: Section 2.12(9 to 13)
43- L40	Unit-III Introduction
44- L41	Direct Products
45- L42	Direct Products
46- L43	Direct Products
47- L44	Finite Abelian Groups
48- L45	Finite Abelian Groups
49- L46	Finite Abelian Groups
50- L47	Problems: Section 2.13(1 to 3)
51- L48	Problems: Section 2.13(4 to 6)
52- L49	Problems: Section 2.13(7 to 10)
53- L50	Problems: Section 2.14(1 to 4)
54- L51	Problems: Section 2.14(5 to 8)
55- P3	**Department Seminar**
56-L52	Problems: Section 2.14(9 to 12)
57-L53	Unit-IVIntroduction
58-L54	The Field of Quotients of an Integral Domain
59- 55L	The Field of Quotients of an Integral Domain
60- L56	The Field of Quotients of an Integral Domain
61- L57	The Field of Quotients of an Integral Domain
62- L58	**Allotting portion for Internal Test-II**
	Internal Test II begins22-08-2016
63- L59	The Field of Quotients of an Integral Domain
64- L60	Euclidean Rings
65- IT-II	**Internal Test-II**
66- L61	Euclidean Rings
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Euclidean Rings
69- L64	Euclidean Rings
70- L65	Euclidean Rings
71- L66	Euclidean Rings
72- L67	A Particular Euclidean Ring
73- L68	A Particular Euclidean Ring
74- L69	A Particular Euclidean Ring
75- L70	A Particular Euclidean Ring
76- L71	A Particular Euclidean Ring
77- L72	A Particular Euclidean Ring
78- L73	Problems: Section 3.6(1 to 4)
79-L74	Problems: Section 3.7(1 to 4)
80-L75	Problems: Section 3.7(5 to 8)

81-L76	Problems: Section 3.8(1 to 3)
82-L77	Problems: Section 3.8(4 to 6)
83-L78	Problems: Section 3.6(7 to 9)
84-L79	Unit-V Introduction
85-L80	Polynomial Rings
86-L81	Polynomial Rings
87-L82	Polynomial Rings
88-L83	Polynomials over the Rational Field
89-L84	Polynomials over the Rational Field
90-P4	**College level meeting/ function**
91-L85	Polynomials over the Rational Field
92-L86	Polynomials over the Rational Field
93-L87	Polynomials over Commutative Rings
94-L88	Polynomials over Commutative Rings
95-L89	Polynomials over Commutative Rings
96-L90	Polynomials over the Rational Field
97-L91	Polynomials over Commutative Rings
98-L92	Problems: Section 3.9(1 to 3)
99-L93	Problems: Section 3.9(4& 5)
100-L94	Problems: Section 3.9(6&7)
101-L95	Problems: Section 3.10(1 to 3)
102-L96	Problems: Section 3.10(4 to 5)
103-L97	Problems: Section 3.11(1 to 3)
104-L98	Problems: Section 3.11(4 to 6)
105-L99	Problems: Section 3.11(7 to 9)
106-L100	Problems: Section 3.11(10& 11)
107-L101	Problems: Section 3.11(12 & 13)
108-L102	Problems: Section 3.11(14 & 15)
109- L103	**Allotting portion for Internal Test-III**
	Internal Test III begins03-10-2016
110- L104	Revision
111- L105	Revision
112-IT-III	**Internal Test-III**
113- L106	Revision
114- L107	**Test Paper distribution and result analysis**
115- L108	Revision
	Entering Internal Test-III Marks into University portal
116-MT	**Model Test begins on 17-10-2016**
117-MT	**Model Test**
118-MT	**Model Test**
119-L109	**Model test paper distribution and previous year university question paper discussion**
120-L110	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-10-2016

Course Outcomes

Learning Outcomes	**COs** of the course “<Algebra-I>”
CO1	Learners will acquire knowledge on Counting Principle and Homomorphisms.
CO2	Knowledge gained about Automorphisms and Cayley’s theorem.
CO3	Learners will gain knowledge about Permutation groups, Sylow’s theorems and Direct products.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis-I
Course Code	**KMAM12**
Class	I year (2016-2017)
Semester	Odd
Staff Name	Dr. J. S. Suresh Suseela
Credits	8
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Syllabus

1.2 Paper 2-Analysis-I

Text: Principles of Mathematical Analysis, Third Edition, Walter Rudin-Mcgraw-Hill International Book Company.

Unit 1: Metric spaces-Compact sets-Perfect sets-Cantor sets-Connected sets. (Sections 2.15 to 2.47) Exercise Problems: Chapter 2(5 to 20)

Unit 2: Convergence sequences-Series-The number e. (Sections 3.1 to 3.32) Exercise Problems: Chapter 3(1 to 8)

Unit 3: The root and ratio tests-Power series-Absolute Convergence-Rearrangements. (Sections 3.33 and 3.55) Exercise Problems: Chapter 39 to 13)

Unit 4: Continuity. (Chapter 4) Exercise Problems: Chapter 4(Ito 5, 14 to 16 and 18 to 20)

Unit 5: Differentiation. (Chapter 5) Exercise Problems: Chapter 5(Ito 12)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2016
1-L1	Unit-I Introduction
2-L2	Metric spaces
3- L3	Metric spaces
4-L4	Metric spaces
5-L5	Metric spaces
6-L6	Metric spaces
7-L7	Compact sets
8-L8	Compact sets
9-L9	Compact sets
10-L10	Compact sets
11-L11	Compact sets
12-L12	Perfect sets
13-L13	Perfect sets
14-L14	Perfect sets
15-L15	Perfect sets
16-P1	**Welcoming of First year and Inauguration of Mathematics Association**
17-L16	Cantor sets
18-L17	Cantor sets
19-L18	Cantor sets
20-L19	Connected sets
21-L20	Connected sets
22-L21	Connected sets
23-L22	Connected sets
24-L23	Exercise Problems: Chapter 2(5 to 7)
25-L24	Exercise Problems: Chapter 2(8 to 10)
26-L25	Exercise Problems: Chapter 2(11 to 13)
27-L26	Exercise Problems: Chapter 2(14 to 17)
28-L27	Exercise Problems: Chapter 2(18 to 20)
29-L28	**Allotting portion for Internal Test-I**
	Internal Test I begins25-07-2016
30-L29	Unit-II Introduction
31- L30	Convergence sequences
32- IT-1	**Internal Test-I**

33- L31	Convergence sequences
34- L32	Convergence sequences
35- L33	Convergence sequences
36- L34	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
37- L35	Convergence sequences
38- L36	Series
39- L37	Series
40- P2	**College level meeting/Cell function**
41- L38	Series
42- L39	Series
43- L40	The number e
44- L41	The number e
45- L42	The number e
46- L43	The number e
47- L44	Exercise Problems: Chapter 3(1,2)
48- L45	Exercise Problems: Chapter 3(3,4)
49- L46	Exercise Problems: Chapter 3(5,6)
50- L47	Exercise Problems: Chapter 3(7,8)
51- L48	Unit-III Introduction
52- L49	The root test
53- L50	The root test
54- L51	The ratio test
55- P3	**Department Seminar**
56-L52	The ratio test
57-L53	Power series
58-L54	Power series
59- 55L	Power series
60- L56	Power series
61- L57	Absolute Convergence
62- L58	**Allotting portion for Internal Test-II**
	Internal Test II begins22-08-2016
63- L59	Absolute Convergence
64- L60	Absolute Convergence
65- IT-II	**Internal Test-II**
66- L61	Absolute Convergence
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Rearrangements
69- L64	Rearrangements
70- L65	Rearrangements
71- L66	Rearrangements
72- L67	Exercise Problems: Chapter 3(9 to 11)

73- L68	Exercise Problems: Chapter 3(12,13)
74- L69	Unit-IV Introduction
75- L70	Continuity.
76- L71	Continuity.
77- L72	Continuity.
78- L73	Continuity.
79-L74	Continuity.
80-L75	Continuity.
81-L76	Exercise Problems: Chapter 4(1 to 3)
82-L77	Exercise Problems: Chapter 4(4,5)
83-L78	Exercise Problems: Chapter 4(14,15)
84-L79	Exercise Problems: Chapter 4(16,18)
85-L80	Exercise Problems: Chapter 4(19,20)
86-L81	Unit-V Introduction
87-L82	Differentiation
88-L83	Differentiation
89-L84	Differentiation
90-P4	**College level meeting/ function**
91-L85	Differentiation
92-L86	Differentiation
93-L87	Differentiation
94-L88	Differentiation
95-L89	Differentiation
96-L90	Exercise Problems: Chapter 5(1,2)
97-L91	Exercise Problems: Chapter 5(3,4)
98-L92	Exercise Problems: Chapter 5(5,6)
99-L93	Exercise Problems: Chapter 5(7,8)
100-L94	Exercise Problems: Chapter 5(9,10)
101-L95	Exercise Problems: Chapter 5(10)
102-L96	Exercise Problems: Chapter 5(11)
103-L97	Exercise Problems: Chapter 5(12)
104-L98	Problems
105-L99	Problems
106-L100	Problems
107-L101	Problems
108-L102	Problems
109- L103	**Allotting portion for Internal Test-III**
	Internal Test III begins03-10-2016
110- L104	Revision
111- L105	Revision
112-IT-III	**Internal Test-III**
113- L106	Revision
114- L107	**Test Paper distribution and result analysis**
115- L108	Revision

	Entering Internal Test-III Marks into University portal
116-MT	**Model Test begins on 17-10-2016**
117-MT	**Model Test**
118-MT	**Model Test**
119-L109	**Model test paper distribution and previous year university question paper discussion**
120-L110	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-10-2016

Course Outcomes

Learning Outcomes	**COs** of the course “<Analysis-I>”
CO1	Acquisition of knowledge about Metric spaces, Compact sets, Perfect sets, Cantor sets and Connected sets.
CO2	Learners will gain knowledge about Convergence sequences, Sub sequences, Cauchy sequence, Lower and Upper limits, Series and Some special sequences
CO3	Knowledge gained about Root test and Ratio test
CO4	Students will gain knowledge on Continuity, Limit of functions and Discontinuous.
CO5	Students will know about Differentiation, Derivative of a real function, L’Hospital Rule and Taylor’s theorem

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Probability & Statistics
Course Code	**KMAM13**
Class	I year (2016-2017)
Semester	Odd
Staff Name	Dr. A. Alwyn Asir
Credits	7
L. Hours /P. Hours	7 / WK
Total 105Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 95 Hrs (5 units; 5×19=95; 19Hrs /unit)	

Course Objectives

- How to calculate and apply measures of location and measures of dispersion – grouped and ungrouped data cases.
- How to calculate correlation and regression in various business problems.
- How to apply attributes to various types of problems.
- How to apply discrete and continuous probability distributions to various business problems.
- Provide a foundation and motivation for exposure to statistical ideas subsequent to the course

Syllabus

1.3 Paper 3-Probability and Statistics

Text: Introduction to Mathematical Statistics, Fourth Edition-Robert V. Hogg and Allen T.Craig. Pearson Education Asia.

Unit 1: Chebyshev's inequality-Conditional Probability and Stochastic Independence. (Chapter 1-Section 1.11 and Chapter 2) Exercise Problems: Chapter 1(1.104, 1.105. 1.106) and Chapter 2(2.1 to 2.33)

Unit 2: Some special Distributions.(Chapter 3) Exercise Problems: Chapter 3(3.1 to 3.54 and 3.62 to 3.65)

Unit 3: Sampling Theory-Transformation of Variables-t and F distributions. (Chapter 4-Section 4.1 to 4.4) Exercise Problems: Chapter 4(4.1 to 4.41)

Unit 4: Change of variable Technique-The MGF technique-Distributions of X and

- Expectations of functions of random variables.

(Chapter 4-Section 4.5 to 49) Exercise Problems: Chapter 4 (4.42, 4.43, 4.50 to 4.60.4.68 to 4.74 and 4.83 to 4.98)

Unit 5: Limiting Distributions. (Chapter 5)

Exercise Problems: Chapter 5(5.1 to 5.16, 5.20 to 5.27 and 5.30 to 5.35)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2016
1-L1	Unit-I Introduction
2-L2	Chebyshev's inequality
3- L3	Chebyshev's inequality
4-L4	Chebyshev's inequality
5-L5	Chebyshev's inequality
6-L6	Conditional Probability
7-L7	Conditional Probability
8-L8	Conditional Probability
9-L9	Conditional Probability
10-L10	Stochastic Independence
11-L11	Stochastic Independence
12-L12	Stochastic Independence
13-P1	**Welcoming of First year and Inauguration of Mathematics Association**
14-L13	Stochastic Independence
15-L14	Exercise Problems: Chapter 1(1.104, 1.105. 1.106)
16-L15	Exercise Problems: Chapter 2(2.1-2.5)
17-L16	Exercise Problems: Chapter 2(2.6-2.9)
18-L17	Exercise Problems: Chapter 2(2.10-2.15)
19-L18	Exercise Problems: Chapter 2(2.16-2.20)
20-L19	Exercise Problems: Chapter 2(2.21-2.24)
21-L20	Exercise Problems: Chapter 2(2.25-2.29)
22-L21	Exercise Problems: Chapter 2(2.30-2.33)
23-L22	Unit-II Introduction
24-L23	Some special Distributions
25-L24	**Allotting portion for Internal Test-I**

	Internal Test I begins25-07-2016
26-L25	Some special Distributions
27-L26	Some special Distributions
28-IT-1	**Internal Test-I**
29-L27	Some special Distributions
30-L28	Some special Distributions
31- L29	Some special Distributions
32- L30	Some special Distributions
33- L31	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
34- L32	Exercise Problems: Chapter 3(3.1 to 3.8)
35- L33	Exercise Problems: Chapter 3(3.9 to 3.16)
36- L33	Exercise Problems: Chapter 3(3.17 to 3.24)
37- L35	Exercise Problems: Chapter 3(3.25 to 3.30)
38- L36	Exercise Problems: Chapter 3(3.31 to 3.38)
39- L37	Exercise Problems: Chapter 3(3.39 to 3.48)
40-P2	**College level meeting/Cell function**
41- L38	Exercise Problems: Chapter 3(3.49 to 3.54)
42- L39	Exercise Problems: Chapter 3(3.62 to 3.65)
43- L40	Unit-III Introduction
44- L41	Sampling Theory
45- L42	Sampling Theory
46- L43	Sampling Theory
47- L44	Sampling Theory
48- L45	Transformation of Variables
49- L46	Transformation of Variables
50- L47	Transformation of Variables
51- L48	Transformation of Variables
52- L49	t distributions
53- L50	t distributions
54- P3	**Department Seminar**
55- L51	t distributions
56- L52	t distributions
57- L53	F distributions
58- L54	**Allotting portion for Internal Test-II**
59- L55	**Internal Test II begins22-08-2016**
60- L56	F distributions
61- L57	F distributions
62- IT-II	**Internal Test-II**
63- L58	Exercise Problems: Chapter 4(4.1 to 4.10)
64- L59	Exercise Problems: Chapter 4(4.11 to 4.20)
65- L60	Exercise Problems: Chapter 4(4.21 to 4.30)
66- L61	Exercise Problems: Chapter 4(4.31 to 4.41)

67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Unit-IV Introduction
69- L64	Change of variable Technique
70- L65	Change of variable Technique
71- L66	The MGF technique
72- L67	The MGF technique
73- L68	Distributions of X
74- L69	Expectations of functions of random variables
75- L70	Exercise Problems: Chapter 4 (4.42, 4.43, 4.50 to 4.60)
76- L71	Exercise Problems: Chapter 4 (4.68 to 4.74)
77- L72	Exercise Problems: Chapter 4 (4.83 to 4.90)
78- L73	Exercise Problems: Chapter 4 (4.91 to 4.98)
79- L74	Unit-V Introduction
80- L75	Limiting Distributions
81- L76	Limiting Distributions
82- P4	**College level meeting/ function**
83- L77	Limiting Distributions
84- L78	Limiting Distributions
85- L79	Limiting Distributions
86- L80	Limiting Distributions
87- L81	Limiting Distributions
88- L82	Exercise Problems: Chapter 5(5.1 to 5.8)
89- L83	Exercise Problems: Chapter 5(5.9 to 5.16)
90- L84	Exercise Problems: Chapter 5(5.20 to 5.23)
91- L85	Exercise Problems: Chapter 5(5.24 and 5.27)
92- L86	Exercise Problems: Chapter 5(5.30 to 5.35)
93- L87	Revision
94- L88	**Allotting portion for Internal Test-III**
	Internal Test III begins03-10-2016
95- L89	Revision
96- IT-III	**Internal Test-III**
97- L90	Revision
98- L91	Revision
99- L92	**Test Paper distribution and result analysis**
100- L93	Revision
	Entering Internal Test-III Marks into University portal
101- MT	**Model Test begins on 17-10-2016**
102- MT	**Model Test**
103- MT	**Model Test**
104- L94	**Model test paper distribution and previous year university question paper discussion**
105- L-95	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-10-2016

Course Outcomes

Learning Outcomes	**COs** of the course “<Statistics-I>”
CO1	Students learn the concept of measures of dispersion.
CO2	Students learn the concept of measures of central tendencies.
CO3	Gain the knowledge on probability distributions.
CO4	Gain knowledge on Concepts of Random Variables and Distributions
CO5	Acquire knowledge on Basic Concepts of Expectation and continuous & discrete distribution

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Partial Differential Equation
Course Code	**PMAE23**
Class	I year (2017-2018)
Semester	Even
Staff Name	V.Selvan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Partial Differential Equations in one of the important branches of Mathematics which provides techniques to solve operator equations in Fluid Mechanics. Partial Differential Equations arise when the dependent variable depends on more than one independent variables. The purpose of this course is to find the relation between the variables from the relation between the variables and its partial derivatives. Students are expected to have good knowledge of basic Calculus and the Theory of Ordinary Differential Equations.

Syllabus

Text Book: Elements Of Partial Differential Equations, IAN N. SNEDDON, McGraw Hill, New Delhi,1983.

Unit I: Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$ - 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)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Introduction
2-L2	Methods of Solution of $\frac{dx}{p} + \frac{dy}{Q} + \frac{dx}{R}$
3- L3	Methods of Solution of $\frac{dx}{p} + \frac{dy}{Q} + \frac{dx}{R}$
4-L4	Methods of Solution of $\frac{dx}{p} + \frac{dy}{Q} + \frac{dx}{R}$
5-L5	Pfaffian Differential Forms and Equations
6-L6	Pfaffian Differential Forms and Equations
7-L7	Pfaffian Differential Forms and Equations
8- P1	**Inauguration of Mathematics Association**
9- L8	Solution of Pfaffian Differential Equations in three variables
10- L9	Solution of Pfaffian Differential Equations in three variables
11-L10	Solution of Pfaffian Differential Equations in three variables
12-L11	Solution of Pfaffian Differential Equations in three variables
13-L12	Partial Differential equations
14-L13	Partial Differential equations
15-L14	Partial Differential equations
16-L15	Origins of first order Partial Differential equations
17- L16	Origins of first order Partial Differential equations
18- L17	Origins of first order Partial Differential equations
19- L18	Linear equations of the first order
20- L19	Linear equations of the first order
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins(22-01-2018)
22- L21	Linear equations of the first order
23- IT-1	**Internal Test-I**

24- L22	Linear equations of the first order
25- L23	Integral surfaces passing through a given curve
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Integral surfaces passing through a given curve
28- L26	Integral surfaces passing through a given curve
29- L27	Integral surfaces passing through a given curve
30- P2	**College level meeting/Cell function**
31-L28	Cauchy's Method of Characteristics
32-L29	Cauchy's Method of Characteristics
33-L30	Cauchy's Method of Characteristics
34- L31	Cauchy's Method of Characteristics
35- L32	Compatible systems of First order Equations
36- L33	Compatible systems of First order Equations
37- L34	Compatible systems of First order Equations
38-L35	Compatible systems of First order Equations
39- L36	Charpit's Method
40- L37	Charpit's Method
41- L38	Charpit's Method
42-P3	**Department Seminar**
43- L39	Second order equations in Physics
44- L40	Second order equations in Physics
45- L41	Second order equations in Physics
46- L42	Linear Partial Differential equations with Constant Coefficients
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins(26-02-2018)
48- L44	Linear Partial Differential equations with Constant Coefficients
49-IT-II	**Internal Test-II**
50-L45	Characteristics of Equations in three variables
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Characteristics of Equations in three variables
53- L48	Characteristics of Equations in three variables
54- L49	Characteristics of Equations in three variables
55- L50	Problems
56- L51	Problems
57- L52	Problems
58- L53	Separation of variables
59-P4	**College level meeting/ function**
60- L54	Separation of variables
61- L55	Separation of variables
62- L56	Separation of variables
63- L57	Separation of variables
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins(01-04-2018)
65- L59	Problems
66- L60	Problems
67-IT-III	**Internal Test-III**

68- L61	Revision
69- L62	Revision
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test (12-04-2018)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course "Partial Differential Equation"
CO1	Acquisition of knowledge about Pfaffian Differential Forms and Equations and their Solution in three variables.
CO2	Students will know about Origins of first order Partial Differential equations.
CO3	Knowledge gained about Cauchy's Method of Characteristics and Charpit's Method.
CO4	Learners will know about Second order equations in Physics, Linear Partial Differential equations with Constant Coefficients and Characteristics of Equations in three variables.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Algebra – II
Course Code	**PMAM21**
Class	I year (2017-2018)
Semester	Even
Staff Name	C. Henrietta Johnsy
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To understand the concepts on ring theory
- To classify the properties in Euclidean rings and Principal ideal rings
- To explain about the polynomial rings over some specific spaces
- To study the various types of radicals and direct sum of rings

Syllabus

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**

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07.12.2017
1-L1	Unit I – Introduction to ring and ring homomorphism
2-L2	Kernel of a ring homomorphism and results on it.
3- L3	Examples to explain ring homomorphism and its kernel; definition of Isomorphism
4-L4	Ideal of a ring and examples
5-L5	Illustration of Quotient ring and its homomorphic image
6-L6	Necessary condition for a commutative ring to become a field
7-L7	Maximal ideals; the structure of maximal ideals of the ring of integers
8- P1	**Inauguration of Mathematics Association**
9- L8	Necessary and sufficient condition for an ideal of a commutative ring to be a maximal ideal
10- L9	Imbedding a ring into another ring
11-L10	Every integral domain can be imbedded in a field – Proof discussion
12-L11	Every integral domain can be imbedded in a field – Proof discussion (contd.)
13-L12	The field of Quotients of an integral domain
14-L13	Unit II – Integral domain, zero divisors, and Euclidean ring
15-L14	Characterization of ideals in a Euclidean ring
16-L15	Definition of Principal ideal ring and implications between Euclidean ring and Principal ideal ring
17- L16	Definition of 'divide' and some results on it
18- L17	greatest common divisor of two elements and its general form in a Euclidean ring
19- L18	'Units' in a commutative ring and some properties
20- L19	Associate elements in a commutative ring and d-value of non-unit elements
21- L20	Prime element in a Euclidean ring and expression of every elements in prime factors - **Allotting portion for Internal Test-I**
	Internal Test I begins(22.01.2018)
22- L21	Relatively prime and its property in a Euclidean ring
23- IT-1	**Internal Test-I**

24- L22	Unique Factorization theorem
25- L23	Necessary and sufficient condition for the generating element of an ideal in a Euclidean ring R to be a prime element of R
26- L24	The particular Euclidean ring J[i] - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Basic lemmas to prove Fermat theorem
28- L26	Proof of Fermat theorem
29- L27	Unit III – The Polynomial ring F[x] over a field. Defining the equality, sum, product of polynomials
30- P2	**College level meeting/Cell function**
31-L28	Degree of a polynomial and finding the degree of the product of two or more polynomials
32-L29	The Division Algorithm in a polynomial ring
33-L30	Irreducible polynomials over the field and the structure of maximal ideals in polynomial ring
34- L31	Primitive polynomials and its property
35- L32	Content of a polynomial and Gauss' Lemma
36- L33	Integer monic polynomials and The Eisenstein Criterion
37- L34	The polynomial rings over a commutative ring
38- L35	Definition of Unique factorization domain (UFD)
39- L36	The existence of greatest common divisor of any two elements in a UFD
40- L37	Content, primitive concepts in the polynomial rings over a commutative ring
41- L38	Unique factorization of primitive polynomial in R[x] if R is UFD
42-P3	**Department Seminar**
43- L39	The implication of unique factorization domain between R and R[x]
44- L40	Unit IV – Jacobson radical of a ring (rad R); semi-simple ring
45- L41	Finding rad R for some rings, namely ring of integers, C[0,1] and ring of formal power series
46- L42	Structure of an ideal that is subset of the Jacobson radical
47- L43	Corollaries to discuss about idempotent element, nil ideal, invertible elements using 'rad R'. - **Allotting portion for Internal Test-II**
	Internal Test II begins(26.02.2018)
48- L44	Proving that the quotient ring R/rad R is semi-simple.
49-IT-II	**Internal Test-II**
50-L45	Expressing the Jacobson radical of a quotient ring R/I as a function of the radical of R.
51- L46	Necessary and sufficient condition for that a principal ideal domain to be semi-simple; and its consequences. - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Prime radical of a ring 'Rad R' and its results
53- L48	Nil radical of an ideal in a ring
54- L49	Relation between the Jacobson and nil radical in the ring of polynomials R[x]
55- L50	Idempotent of a quotient ring can be raised or lifted into the ring – Definition and its results
56- L51	Unit V – Quasi-regular elements in a ring; existence of quasi-regular elements and quasi-inverse
57- L52	The 'circle operation' of Perlis; and some results under circle operation
58- L53	*J*-radical J(R) of a ring and *J*-semisimple ring – Definitions, examples

59-P4	**College level meeting/ function**
60- L54	Claiming that the *J*-radical is an ideal of the ring
61- L55	Proving that the quotient ring R/J(R) is *J*-semisimple.
62- L56	Complete direct sum of the collection of rings
63- L57	Discrete direct sum of the collection of rings and i^{th} component projections
64- L58	Subdirect sum. Structure of a ring that is isomorphic to a subdirect sum of a collection of rings –**Allotting portion for Internal Test-III**
	Internal Test III begins (01.04.2018)
65- L59	Some examples and theorems under subdirect sum
66- L60	A necessary condition of a ring which is prerequisite to study Artinian rings
67-IT-III	**Internal Test-III**
68- L61	Chinese Remainder Theorem and definition of ‘sub-directly irreducible’
69- L62	Birkhoff theorem – Proof discussion
70- L63	Heart of a ring and McCoy theorem - **Test Paper distribution and result analysis**
	Model Test begins
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test(12.04.2018)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course “Algebra II”
CO1	After studying this course, Students can have a better ability to explain about ring and ring homomorphism.
CO2	Illustrate about ideals and some special kind of ideals
CO3	Classify the properties in Euclidean rings and Principal ideal rings
CO4	Ability to solve problems in Euclidean rings and its particular rings
CO5	Can explain about certain radicals of a ring, such as, Jacobson radical, nil radical, prime radical and *J*-radical.
CO6	Classify the difference between complete direct sums, discrete direct sums, subdirect sums
Experimental Learning	
EL1	Differentiate the types of rings graphically
EL2	Classifications on certain radicals of a ring
EL3	The defining manner of Euclidean ring is demonstrating as an generalization of ring of integers
EL4	Motivated to solve CSIR-NET questions based on ring theory

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis II
Course Code	**PMAM22**
Class	I year (2017-2018)
Semester	Even
Staff Name	S ShymlalaMalini
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Understanding the concept of Riemann Integral .
- Gain Knowledge about Uniform convergence
- Understanding the concept of Power series, Fourier series
- Gain Knowledge of Gamma functions

Syllabus

2.1 Paper 7: ANALYSISII

Text Book: Principles of Mathematical Analysis, Third Edition, Walter Rudin – McGraw Hill International BookCompany.

UnitI: Definition and Properties of Integral – Integration andDifferentiation.
Chapter 6: Section: 6.1 – 6.22.

Exercise Problems: Chapter 6: 1, 2, 4, 5, 10, 11.

UnitII: Integration of vector valued functions – Rectifiable arcs, Sequence and Series of functions: Discussion of main problem – Uniform Convergence – Uniform Convergence andContinuity.
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.

UnitIV: The Stone Weierstrass Theorem - PowerSeries.
Chapter 7: Section: 7.26– 7.33 and **Chapter 8:** Section: 8.1 – 8.5.

Exercise Problems: Chapter 8: 1 – 5.

UnitV: 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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Unit I Definition of Riemann Integral and examples
2-L2	Theorems in Riemann Integral
3- L3	Theorems in Riemann Integral
4-L4	Properties of the Integral
5-L5	The fundamental theorem of calculas
6-L6	Theorem of Integration by parts
7-L7	Theorems in Riemann Integral
8- P1	**Inauguration of Mathematics Association**
9- L8	Theorems in Riemann Integral
10- L9	Introduction of vector valued functions
11-L10	Theorems in vector valued functions
12-L11	Theorems in vector valued functions
13-L12	Definition of rectifiable curve and theorems
14-L13	Theorems in rectifiable curve
15-L14	Unit II Definition of convergent sequence and convergent series with examples
16-L15	Theorems in convergent sequence and convergent series
17- L16	Theorems in convergent sequence and convergent series
18- L17	Problems in convergent sequence and convergent series
19- L18	Problems in convergent sequence and convergent series
20- L19	Definition of Uniform convergence and examples
21- L20	Riemann Integral to convergent sequenc - **Allotting portion for Internal Test-I**
	Internal Test I begins22.01.2018
22- L21	Cauchy criterion theorem
23- IT-1	**Internal Test-I**

24- L22	Wierestrass theorem
25- L23	Theorems in Uniform convergent sequence
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Theorems in Uniform convergent sequence
28- L26	Problems in Uniform convergent sequence
29- L27	Unit III Definition of Integrations and examples
30- P2	**College level meeting/Cell function**
31-L28	Theorems in Integrations
32-L29	Theorems in Integrations
33-L30	Theorems in Integrations
34- L31	Theorems in Integrations
35- L32	Problems in Integrations
36- L33	Problems in Integrations
37- L34	Theorems in Equicontinuous
38- L35	Theorems in Equicontinuous
39- L36	Theorems in Equicontinuous
40- L37	Theorems in Equicontinuous
41- L38	Problems in Equicontinuous
42-P3	**Department Seminar**
43- L39	Equicontinuous
44- L40	Unit IV The stone wierestrass theorem
45- L41	The stone wierestrass theorem
46- L42	Definition of algebra, Uniform closure and examples
47- L43	Cauchy criterian theorem toEquicontinous - **Allotting portion for Internal Test-II**
	Internal Test II begins 26.02.2018
48- L44	Theorems in algebra and Uniform closure
49-IT-II	**Internal Test-II**
50-L45	Theorems in algebra and Uniform closure
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Theorems in algebra and Uniform closure
53- L48	Theorems in algebra and Uniform closure
54- L49	Stone generalisation theorem
55- L50	Introduction in Power series and theorems
56- L51	Theorems in Power series
57- L52	Taylors theorem
58- L53	Unit V Introduction to The algebraic completeness of the complex field
59-P4	**College level meeting/ function**
60- L54	Theorems in the algebraic completeness of the complex field
61- L55	Definition of Fourier series and theorems
62- L56	Definition of orthonormal and orthogonal and theorems
63- L57	Parsevels Theorem
64- L58	Stone wierestrass theorem to Parsevels theorem- **Allotting portion for Internal Test-III**
	Internal Test III begins 01.04.2018
65- L59	Introduction to gamma function and theorem

66- L60	Some results in gamma functions
67-IT-III	**Internal Test-III**
68- L61	Some results in gamma functions
69- L62	Stirling formula
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test 12.04.2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Analysis II>”
CO1	Describes fundamental properties of Riemann Integral
CO2	Solved Problems in Riemann Integral
CO3	Describes the Properties in Power series
CO4	Solving the problems using Power series

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Classical Mechanics
Course Code	**PMAM23**
Class	I year (2017-2018)
Semester	Even
Staff Name	AlwinAsir
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To study mechanical systems under generalized coordinate systems, virtual work, energy and momentum
- To study mechanics developed by Newton, Langrange, Hamilton and Jacobi

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begins on 07.12.2017
1-L1	Unit I – Introduction: Mechanics of a single particle
2-L2	Conservation theorem for linear momentum of a single particle
3- L3	Conservation theorem for angular momentum of a single particle
4-L4	Some remarks on conservation theorems
5-L5	Energy conservation theorem
6-L6	Problem discussion on mechanics of a single particle
7-L7	Mechanics of a system of particles
8- P1	**Inauguration of Mathematics Association**
9- L8	Conservation theorem for linear momentum of a system of particles
10- L9	Conservation theorem for angular momentum of a system of particles
11-L10	Theorems on Kinetic energy
12-L11	Problem discussion on Kinetic energy
13-L12	Energy conservation theorem
14-L13	Exercise problems using conservation theorem
15-L14	Unit II – Constraints: Different types of constraints
16-L15	Examples for holonomic constraints and non-holonomic constraints
17- L16	Virtual work and D'Alembert's Principle
18- L17	Lagrange's equation from D'Alembert's Principle – Theorem
19- L18	Lagrange's equation for non-holonomic constraints

20- L19	Velocity dependent potentials
21- L20	Rayleigh Dissipation function –**Allotting portion for Internal Test-I**
	Internal Test I begins07.12.2017
22- L21	Lagrangian for charged particle and some problems
23- IT-1	**Internal Test-I**
24- L22	Applications of the Lagrangian equation
25- L23	Lagrangian for a single particle (i) in cartesian coordinates (ii) in polar coordinates
26- L24	Lagrangian for Atwood machine - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Time dependent potential
28- L26	Problem - bead sliding on rotating wire and some exercise problems
29- L27	Unit III – Variation principles and lagrange’s equation - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Hamilton’s principle
32-L29	Stationary values
33-L30	Path of a system – congugration
34- L31	Path of a system – congugration
35- L32	Techniques of calculus of variation - theorem
36- L33	Lagrange’s equation from Hamilton’s principle
37- L34	Shortest distance between two point in a space
38- L35	Minimum surface of revolution
39- L36	Brachistochrone problem
40- L37	Extension of Hanilton’s Principle
41- L38	Extension of Hanilton’s Principle non-holonomic system
42-P3	**Department Seminar**
43- L39	Unit IV –Two body central force problem
44- L40	Reduction to one body problem
45- L41	The equations of motion and first integral theorem
46- L42	The Kepler’s Second law of planetary motion
47- L43	Derivatives - **Allotting portion for Internal Test-II**
	Internal Test II begins24.02.2017
48- L44	Illustrations about derivative and motion
49-IT-II	**Internal Test-II**
50-L45	The equivalent one dimensional problems
51- L46	Classification of orbits - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Examples of the method occurs for a linear restoring force
53- L48	Inverse square law for circular orbits
54- L49	The virial theorem.
55- L50	Problem discussion based on the virial’s theorem
56- L51	Unit V – The differential equation for the orbit

57- L52	Problems on differential equation for the orbit
58- L53	Integrable power-law potentials
59-P4	**College level meeting/ function**
60- L54	The Kepler problem
61- L55	Inverse square law of force
62- L56	Nature of the orbit depends on *e* and *E*
63- L57	The motion in time in the Kepler problem
64- L58	Deriving the approximate version of the Kepler's third law – **Allotting portion for Internal Test-III**
	Internal Test III begins23.03.2017
65- L59	Existence of conserved vector **A** for the Kepler problem
66- L60	The Laplace-Runge-Lenz vector
67-IT-III	**Internal Test-III**
68- L61	Problem discussion
69- L62	Scattering in a central force field
70- L63	Relation of orbit parameters and scattering angle - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins
71-MT	**Model Test 05.04.2017**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 21.04.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Classical Mechanics"
CO1	Able to understand D' Alembert's Principle and simple applications of the LagrangianFormulation.
CO2	Able to analyze the Derivation of Lagrange's Equations from Hamilton's Principle and Extension of Hamilton's Principle to Non-holonomic Systems
CO3	Able to study the concept of the Equations of Motion and the Equivalent One-Dimensional Problems.
CO4	Able to understand the Kepler Problem and Inverse-Square Law of Force.
CO5	Able to distinguish the concept of the Hamilton Equations of Motion and the Principle of Least Action.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Differential Geometry
Course Code	**PMAM24**
Class	I year (2017-2018)
Semester	Even
Staff Name	W. RajammalRanjitha Mary
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To be able to understand the fundamental theorem for plane curves
- To understand fundamental abstract topological structures
- To improve problem solving skills
- To introduce essential ideas and methods of differential geometry

Syllabus

DIFFERENTIAL GEOMETRY

Unit I: The theory of space curves – Definitions , Arc length – Tangent – Normal and Binormal – Curvature and Torsion.

Unit II: Contact between curves and surfaces – Tangent Surface – Involutes and evolutes – Helices

Unit III: Definition of a surface – Curves on a surface – Helicoids – Metric – Direction

Coefficients.

Unit IV: Families of curves – Geodesics , Canonical geodesic equation, Normal Property of

geodesics (Christoffel symbols not included).

Unit V: Geodesic curvature , The Second Fundamental form – Principal Curvature – Lines of

Curvature (Dupin'sindicatrix not included).

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 7-12-2017
1-L1	UNIT I - THE THEORY OF SPACE CURVES- Introduction of Space curves
2-L2	Definitions of space curves
3- L3	Arc Length
4-L4	Problems on Arc Length
5-L5	Tangent – unit tangent vector
6-L6	Osculating plane
7-L7	Problems on Osculating plane
8- P1	**Inauguration of Mathematics Association**
9- L8	Normal - Unit normal vector –Normal plane
10- L9	Theorems on Osculating plane and Normal plane
11-L10	Curvatures of a curve
12-L11	Behaviour of a curve in the neighbourhood of a point on it.
13-L12	Torsion of a curve
14-L13	Curvature &torsion of a curve given as the intersection of two surfaces.
15-L14	UNITII: CONTACT BETWEEN CURVES AND SURFACES - Introduction
16-L15	Osculating Circle and Osculating Sphere
17- L16	Locus of centre of Spherical curvature
18- L17	Tangent surface of a curves
19- L18	Involutes of a curve
20- L19	Evolutes of a curve
21- L20	Helices - **Allotting portion for Internal Test-I**
	Internal Test I begins on 22.01.2018
22- L21	To find the equation of the Involutes
23- IT-1	**Internal Test-I**
24- L22	To find the equation of the Evolutes

25- L23	Definition of circular helices and cylindrical helices
26- L24	Characteristic property of Helices-**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Circular helix and Cylindrical helix
28- L26	Relation between the curvatures of a general helix and its projection on a plane orthogonal to its axis
29- L27	**UNIT III:** DEFINITION OF A SURFACE - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Definition of a curve on a surface
32-L29	Definition Of Parametric Equations – Proper Transformation
33-L30	Equivalent relations of two surfaces
34- L31	Curves on surface
35- L32	Parametric curves and orthogonal to each other
36- L33	Definitions of a Helicoids
37- L34	Right helicoids and General helicoids
38-L35	Definition of Metric
39- L36	Problems on Metric
40- L37	Angle between Parametric curves
41- L38	Elements of area
42-P3	**Department Seminar**
43- L39	Direction coefficients
44- L40	UNIT IV- FAMILIES OF CURVES – Introduction
45- L41	General significance of the sense of the tangent vector
46- L42	Orthogonal trajectories
47- L43	Discuss about the Orthogonal trajectories **Allotting portion for Internal Test-II**
	Internal Test II begins on 26.02.2018
48- L44	Problems on Orthogonal trajectories
49-IT-II	**Internal Test-II**
50-L45	Double family of curves
51- L46	Geodesics - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Derivation of equations to Geodesics
53- L48	Problems on Geodesics
54- L49	Problems on Geodesics
55- L50	Canonical geodesics equations
56- L51	Normal property of Geodesics
57- L52	Equivalent statement of the normal property
58- L53	UNIT V- GEODESIC CURVATURE-Introduction
59-P4	**College level meeting/ function**
60- L54	Examples on Geodesic curvature
61- L55	Problems onGeodesic curvature
62- L56	Second Fundamental form
63- L57	Mensniersthrorem
64- L58	Principal Curvature- **Allotting portion for Internal Test-III**
	Internal Test III begins on 01.04.2018
65- L59	Lines of Curvature Rodrigue's formula
66- L60	Euler's theorem

67-IT-III	**Internal Test-III**
68- L61	Liouville's formula
69- L62	Geometrical interpretation of the second fundamental form
70- L63	Classification of point on a surface - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test 12.04.2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Differential Geometry"
CO1	Appreciation and understanding of what makes properties and arguments geometric
CO2	Understanding between intrinsic and extrinsic properties
CO3	Define the equivalence of two curves
CO4	Define surfaces and their properties
CO5	Express tangent spaces of surfaces
Integrated Activity	
IA1	Rigorous treatment to the concepts and methods of differential geometry via the classical theory of curves and surfaces in Euclidean space
IA2	Able to understand the classical theory of curves and surfaces

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Graph Theory
Course Code	**PMAM25**
Class	I year (2017-2018)
Semester	Even
Staff Name	G.Jeya Kumar
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Graph Theory is an integral part of Discrete Mathematics and has applications indiversified areas such as Electrical Engineering, Computer science, Linguistics
- Study the basic concepts of Graph theory such as Trees, connectivity, tour, trail, cycles, etc.
- To understand the ideas of matchings and colourings in graphs and some of its applications
- Illustration on ramsey number of a graph and ramsey's graph with recursion formula to calculate ramsey number
- To explain the concepts of independent number and cliques of a graph and its results

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07.12.2017
1-L1	Unit I – Acyclic graphs, Tree and edges of tree in terms of vertices
2-L2	Cut edges; Equivalent condition for cut edges
3- L3	Spanning tree and some results on spanning tree
4-L4	Edge cut, bond and cotree
5-L5	Cut vertices; Necessary and sufficient condition for a vertex of a tree to be a cut vertex
6-L6	Edge contraction and recursion formula to find the number of spanning trees
7-L7	Cayley's formula and its proof that is given by Prufer
8- P1	**Inauguration of Mathematics Association**
9- L8	Connectivity – its basic definitions and examples
10- L9	Theorem giving relation between edge and vertex connectivities
11-L10	Block of a connected graph
12-L11	Menger's theorem
13-L12	Application on construction of reliable communication networks
14-L13	Harary's theorem on *m*-connected graph
15-L14	Unit II – Tour, trail, walk path and cycle definitions with examples
16-L15	Necessary and sufficient condition for a graph to be an eulerian
17- L16	Necessary and sufficient condition for a connected graph to have an Euler trail
18- L17	Hamilton path and cylces of a graph and examples
19- L18	Necessary condition for a graph to be hamiltonian
20- L19	Dirac's theorem

21- L20	Closure of a graph and some basic result - **Allotting portion for Internal Test-I**
	Internal Test I beginson22.01.2018
22- L21	Closure property on Hamiltonian graph
23- IT-1	**Internal Test-I**
24- L22	Chvatal's theorem on degree sequences
25- L23	Chvatal's theorem on degree majorized graphs
26- L24	Condition for a simple graph to be a Hamiltonian graph - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Application: The Chinese postman problem
28- L26	Fleury's Algorithm
29- L27	Unit III –Matchings and Berge theorem
30- P2	**College level meeting/Cell function**
31-L28	Matchings and coverings in bipartite graphs
32-L29	Hall's theorem on bipartite graph
33-L30	Perfect matching and some results
34- L31	Marriage theorem
35- L32	Theorem on maximum matching and minimum covering
36- L33	Tutte's theorem – necessary and sufficient condition for a graph to have a perfect matching
37- L34	Peterson theorem on 3-regular graph
38- L35	Edge chromatic number: basic definitions and examples
39- L36	Results on edge colouring and chromatic number for bipartite graph
40- L37	Vizing's theorem
41- L38	Vizing's theorem (continuation)
42-P3	**Department Seminar**
43- L39	Unit IV –Independent sets of a graph
44- L40	Necessary and sufficient condition for a subset of the vertex set to be an independent set of the graph
45- L41	Edge independence number and Gallai's theorem
46- L42	Koning's theorem on bipartite graph
47- L43	Clique of a graph and some basic results - **Allotting portion for Internal Test-II**
	Internal Test II beginson26.02.2018
48- L44	Ramsey numbers and recursion formula on ramsey number
49-IT-II	**Internal Test-II**
50-L45	Illustration of ramsey number using graphs
51- L46	(k, l)-Ramsey graph and results- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Erdos theorem on r(k, k)
53- L48	Complete *m*-partite graph on *n*-vertices
54- L49	Turan's theorem
55- L50	Turan's theorem (continuation)

56- L51	Unit V – Vertex colouring: k-vertex colouring of a graph, chromatic number of a graph, illustration
57- L52	Theorem on k-critical graphs
58- L53	Results on critical graphs
59-P4	**College level meeting/ function**
60- L54	Driac's theorem on k-critical graph
61- L55	Brook's theorem
62- L56	Subvision of a graph
63- L57	Remarks on Hajos' conjecture
64- L58	Chromatic polynomials of a graph - **Allotting portion for Internal Test-III**
	Internal Test III begins01.04.2018
65- L59	Algorithm to find the chromatic polynomial of a graph
66- L60	Chromatic polynomial of any graph as a linear combination of chromatic polynomials of complete graphs
67-IT-III	**Internal Test-III**
68- L61	Girth and chromatic number
69- L62	Mycielski's theorem
70- L63	Problem discussion on chromatic number and polynomials - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 12.04.2018
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Graph Theory"
CO1	Able to understand the definitions namely, cut vertex, bridge and blocks on a graph
CO2	Study the properties of trees and connectivity
CO3	Identify Eulerian graphs and apply results to identify Hamiltonian graphs
CO4	Understand the concepts Planarity including Euler identity
CO5	Discuss and understand the importance of the concepts Matchings and Colourings
CO6	Able to illustrate the ramsey number of a graph and ramsey's graph with recursion formula which is to calculate ramsey number

CO7	Explain the concepts of independent number and cliques of a graph and its results

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Partial Differential Equation
Course Code	**KMAE23**
Class	II year (2017-2018)
Semester	Even
Staff Name	Mr.V.Selvan
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Syllabus

Text Book: Elements Of Partial Differential Equations, IAN N. SNEDDON, McGraw Hill, New Delhi,1983.

Unit I: Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$ - 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)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Introduction
2-L2	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
3- L3	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
4-L4	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
5-L5	Pfaffian Differential Forms and Equations
6-L6	Pfaffian Differential Forms and Equations
7-L7	Pfaffian Differential Forms and Equations
8- P1	**Inauguration of Mathematics Association**
9- L8	Solution of Pfaffian Differential Equations in three variables
10- L9	Solution of Pfaffian Differential Equations in three variables
11-L10	Solution of Pfaffian Differential Equations in three variables
12-L11	Solution of Pfaffian Differential Equations in three variables
13-L12	Partial Differential equations
14-L13	Partial Differential equations
15-L14	Partial Differential equations
16-L15	Origins of first order Partial Differential equations
17- L16	Origins of first order Partial Differential equations
18- L17	Origins of first order Partial Differential equations
19- L18	Linear equations of the first order
20- L19	Linear equations of the first order
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins on 22-01-2018
22- L21	Linear equations of the first order
23- IT-1	**Internal Test-I**
24- L22	Linear equations of the first order
25- L23	Integral surfaces passing through a given curve
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Integral surfaces passing through a given curve
28- L26	Integral surfaces passing through a given curve
29- L27	Integral surfaces passing through a given curve
30- P2	**College level meeting/Cell function**
31-L28	Cauchy’s Method of Characteristics
32-L29	Cauchy’s Method of Characteristics
33-L30	Cauchy’s Method of Characteristics
34- L31	Cauchy’s Method of Characteristics

35- L32	Compatible systems of First order Equations
36- L33	Compatible systems of First order Equations
37- L34	Compatible systems of First order Equations
38-L35	Compatible systems of First order Equations
39- L36	Charpit’s Method
40- L37	Charpit’s Method
41- L38	Charpit’s Method
42-P3	**Department Seminar**
43- L39	Second order equations in Physics
44- L40	Second order equations in Physics
45- L41	Second order equations in Physics
46- L42	Linear Partial Differential equations with Constant Coefficients
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins on 26-02-2018
48- L44	Linear Partial Differential equations with Constant Coefficients
49-IT-II	**Internal Test-II**
50-L45	Characteristics of Equations in three variables
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Characteristics of Equations in three variables
53- L48	Characteristics of Equations in three variables
54- L49	Characteristics of Equations in three variables
55- L50	Problems
56- L51	Problems
57- L52	Problems
58- L53	Separation of variables
59-P4	**College level meeting/ function**
60- L54	Separation of variables
61- L55	Separation of variables
62- L56	Separation of variables
63- L57	Separation of variables
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins on 1-4-2018
65- L59	Problems
66- L60	Problems
67-IT-III	**Internal Test-III**
68- L61	Revision
69- L62	Revision
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test begins on 12-4-2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Partial Differential Equation”
CO1	Acquisition of knowledge about Pfaffian Differential Forms and Equations and their Solution in three variables.
CO2	Students will know about Origins of first order Partial Differential equations.
CO3	Knowledge gained about Cauchy’s Method of Characteristics and Charpit’s Method.
CO4	Learners will know about Second order equations in Physics, Linear Partial Differential equations with Constant Coefficients and Characteristics of Equations in three variables.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Functional Analysis
Course Code	**KMAM41**
Class	II year (2017-2018)
Semester	Even
Staff Name	Mrs.S.Vijila Velvet Daisy
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objective

- To gain knowledge about Banach Spaces, Hilbert Spaces and Banach Algebra.
- To use algebraic structure in Analysis.

Syllabus

**MSU / 2017-18 / PG –Colleges / M.Sc.(Mathematics) / Semester -IV / Ppr.no.18 /
Core - 16**

Functional Analysis

UNIT 1: BanachSpaces: Banach Spaces- The definition and some examples- Continuous linear transformations- The Hahn Banach Theorem
Chapter 9 Sections 46, 47, 48 .
Problems: Section 46 (1-4), 47 (1-3) 48 (1).

UNIT 2: Imbedding : The Natural Imbedding of N in N**- The open mapping theorem
Chapter 9 Sections 49, 50
Problems: Section 49 (1-3), 50 (2,3)

UNIT 3: Hilbert Spaces: Conjugate of an operator -Hilbert Spaces-The Definition and some simple properties- Orthogonal compliments

Chapter 9 Section 51, Chapter 10 Sections 52, 53
Problems: Section 51 (1-3) 52 (4,6), 53 (1-4).

UNIT 4: The Conjugate space and adjoint: Orthonormal sets-The conjugate space H*- The Adjoint of an operator- Self adjoint operators
Chapter 10 Sections 54, 55, 56, 57
Problems: Section 54 (1,5) 55 (1-3), 56 (1-4), 57 (1,2)

UNIT 5: Spectral Theory: Normal and Unitary operators- projections, Finite dimensional spectral theory- Determinants and the spectrum of an operator- The spectral theorem
Chapter 10 Sections 58, 59, Chapter 11 Sections 61, 62
Problems: Section 58, 59, 61, 62 (1-5) .

Text Book: Introduction to Topology and Modern Analysis- G.F. SIMMONS-McGraw- Hill International Editions

Books for Reference:
1. Functional Analysis - Second edition (2011), Tata MC Graw Hill Education Private Ltd. (New Delhi) – Walter Rudin.
2. Functional Analysis – K.ChandrasekaraRao, Narosa Publishing House (2009) New Delhi.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07-12-2017
1-L1	Introduction
2-L2	Banach Spaces
3- L3	Banach Spaces
4-L4	Banach Spaces
5-L5	The definition and some examples
6-L6	The definition and some examples
7-L7	Continuous linear transformations
8-L8	Continuous linear transformations
9-L9	Continuous linear transformations
10-P1	**Inauguration of Mathematics Association**
11-L10	The Hahn Banach Theorem
12-L11	The Hahn Banach Theorem
13-L12	The Hahn Banach Theorem
14-L13	**Imbedding**
15-L14	The Natural Imbedding of N in N**
16-L15	The Natural Imbedding of N in N**
17-L16	The Natural Imbedding of N in N**
18-L17	The Natural Imbedding of N in N**
19-L18	The open mapping theorem

20-L19	The open mapping theorem
21-L20	The open mapping theorem
22-L21	The open mapping theorem
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins on 22-01-2018
24-L23	Hilbert Spaces
25-L24	Hilbert Spaces
26-IT-1	**Internal Test-I**
27-L25	Conjugate of an operator
28-L26	Conjugate of an operator
29-L27	Conjugate of an operator
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Hilbert Spaces
32- L30	Hilbert Spaces
33- L31	Hilbert Spaces
34-P2	**College level meeting/Cell function**
35- L32	The Definition and some simple properties
36- L33	The Definition and some simple properties
37- L34	The Definition and some simple properties
38- L35	Orthogonal compliments
39- L36	Orthogonal compliments
40- L37	Orthogonal compliments
41- L38	The Conjugate space and adjoint
42- L39	Orthonormal sets
43- L40	Orthonormal sets
44- L41	Orthonormal sets
45- L42	The conjugate space H*
46- L43	The conjugate space H*
47- L44	The conjugate space H*
48- L45	The Adjoint of an operator
49- L46	The Adjoint of an operator
50- L47	The Adjoint of an operator
51- P3	**Department Seminar**
52- L48	Self adjoint operators
53- L49	Self adjoint operators
54- L50	Self adjoint operators
55- L51	Self adjoint operators
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins on 26-02-2018
57-L53	Spectral Theory
58-L54	Spectral Theory
59-IT-II	**Internal Test-II**
60- L55	Spectral Theory
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Normal and Unitary operators
63- L58	Normal and Unitary operators

64- L59	Normal and Unitary operators
65- L60	Normal and Unitary operators
66- L61	projections
67- L62	projections
68- L63	Finite dimensional spectral theory
69- L64	Finite dimensional spectral theory
70- L65	Finite dimensional spectral theory
71- L66	Determinants and the spectrum of an operator
72- L67	Determinants and the spectrum of an operator
73- L68	Determinants and the spectrum of an operator
74-P4	**College level meeting/ function**
75- L69	Determinants and the spectrum of an operator-
76- L70	The spectral theorem
77- L71	The spectral theorem
78- L72	The spectral theorem
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins on 1-4-2018
80- L74	Problems
81- L75	Problems
82-IT-III	**Internal Test-III**
83- L76	Problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test begins on 12-4-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Functional Analysis”
CO1	To gain knowledge about Banach Spaces, Hilbert Spaces and Banach Algebra.
CO2	To use algebraic structure in Analysis.
CO3	Graduates will have a strong foundations and in depth understanding of the current topics related with functional Analysis, Spectral Theory, Approximation Theory.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analytic Number Theory
Course Code	**KMAM42**
Class	II year (2017-2018)
Semester	Even
Staff Name	Dr. G. Jeyakumar
Credits	8
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Course Objectives

- To introduce the fundamental theorem of arithmetic and the Euclidean algorithm
- To explain about various kinds of arithmetical functions and its relations
- To find the averages of arithmetical functions
- To understand the prime number theorem and its equivalent forms as well as to derive some of the asymptotic formulas for certain sums

Syllabus

Text: Introduction to Analytic Number Theory-Tom M.Apostol-Springer International Student Edition

Unit 1: The fundamental theorem of Arithmetic (Chapter 1 and Exercise problems 1 to 30)

Unit 2: Arithmetic functions.(Sections 2.1 to 2.9 and Exercise problems: Chapter 2(1 to 20))

216

Unit 3: Multiplicative functions and Dirichlet Multiplication. (Sections 2.10 to 2.15 and Exercise problems : Chapter 2 (21 to 35))

Unit 4: Averages of Arithmetical functions. (Chapter 3 and Exercise problems: Chapter 3 (1 to 12))

Unit 5: Chebyshev's functions-equivalent forms of prime number theorem-Shapiro's theorem and its applications. (Sections 4.1 to 4.7 and Exercise problems: Chapter 41 to 11)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 7-12-2017
1-L1	Introduction
2-L2	The fundamental theorem of Arithmetic
3- L3	The fundamental theorem of Arithmetic
4-L4	The fundamental theorem of Arithmetic
5-L5	Exercise problems 1 to 4
6-L6	Exercise problems 5 to 10
7-L7	Exercise problems 11 to 15
8-L8	Exercise problems 16 to 20
9-L9	Exercise problems 21 to 25
10-L10	Exercise problems 26 to 30
11-L11	Arithmetic functions
12-L12	Arithmetic functions
13-L13	Arithmetic functions
14-L14	Arithmetic functions
15-L15	Arithmetic functions
16-P1	**Inauguration of Mathematics Association**
17-L16	Exercise problems: Chapter 2(1 to 4)
18-L17	Exercise problems: Chapter 2(5 to 9)
19-L18	Exercise problems: Chapter 2(10 to 14)
20-L19	Exercise problems: Chapter 2(15 to 19)
21-L20	Exercise problems: Chapter 2(20)
22-L21	Multiplicative functions
23-L22	Multiplicative functions
24-L23	Multiplicative functions
25-L24	Multiplicative functions
26-L25	Multiplicative functions
27-L26	Multiplicative functions
28-L27	Dirichlet Multiplication
29-L28	**Allotting portion for Internal Test-I**
	Internal Test I begins22-01-2018
30-L29	Dirichlet Multiplication
31- L30	Dirichlet Multiplication
32-IT-1	**Internal Test-I**
33- L31	Dirichlet Multiplication
34- L32	Dirichlet Multiplication
35- L33	Dirichlet Multiplication
36- L34	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
37- L35	Exercise problems : Chapter 2 (21 to 23)
38- L36	Exercise problems : Chapter 2 (24 to 26)
39- L37	Exercise problems : Chapter 2 (27 to 29)
40- P2	**College level meeting/Cell function**
41- L38	Exercise problems : Chapter 2 (30 to 32)
42- L39	Exercise problems : Chapter 2 (33 to 35)

43- L40	Averages of Arithmetical functions
44- L41	Averages of Arithmetical functions
45- L42	Averages of Arithmetical functions
46- L43	Averages of Arithmetical functions
47- L44	Averages of Arithmetical functions
48- L45	Averages of Arithmetical functions
49- L46	Averages of Arithmetical functions
50- L47	Averages of Arithmetical functions
51- L48	Averages of Arithmetical functions
52- L49	Averages of Arithmetical functions
53- L50	Averages of Arithmetical functions
54- L51	Averages of Arithmetical functions
55- P3	**Department Seminar**
56-L52	Exercise problems: Chapter 3 (1 to 3)
57-L53	Exercise problems: Chapter 3 (4 to 6)
58-L54	Exercise problems: Chapter 3 (7 to 9)
59- 55L	Exercise problems: Chapter 3 (10 to 12)
60- L56	Chebyshev's functions
61- L57	Chebyshev's functions
62- L58	**Allotting portion for Internal Test-II**
	Internal Test II begins26-02-2018
63- L59	Chebyshev's functions
64- L60	Chebyshev's functions
65- IT-II	**Internal Test-II**
66- L61	Chebyshev's functions
67- L62	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Chebyshev's functions
69- L64	Chebyshev's functions
70- L65	Chebyshev's functions
71- L66	equivalent forms of prime number theorem
72- L67	equivalent forms of prime number theorem
73- L68	equivalent forms of prime number theorem
74- L69	equivalent forms of prime number theorem
75- L70	equivalent forms of prime number theorem
76- L71	equivalent forms of prime number theorem
77- L72	equivalent forms of prime number theorem
78- L73	equivalent forms of prime number theorem
79-L74	Shapiro's theorem and its applications
80-L75	Shapiro's theorem and its applications
81-L76	Shapiro's theorem and its applications
82-L77	Shapiro's theorem and its applications
83-L78	Shapiro's theorem and its applications
84-L79	Shapiro's theorem and its applications
85-L80	Shapiro's theorem and its applications
86-L81	Shapiro's theorem and its applications
87-L82	Shapiro's theorem and its applications
88-L83	Shapiro's theorem and its applications

89-L84	Shapiro's theorem and its applications
90-P4	**College level meeting/ function**
91-L85	Exercise problems: Chapter 4(1)
92-L86	Exercise problems: Chapter 4(2)
93-L87	Exercise problems: Chapter 4(3)
94-L88	Exercise problems: Chapter 4(4)
95-L89	Exercise problems: Chapter 4(5)
96-L90	Exercise problems: Chapter 4(6)
97-L91	Exercise problems: Chapter 4(7)
98-L92	Exercise problems: Chapter 4(8)
99-L93	Exercise problems: Chapter 4(9)
100-L94	Exercise problems: Chapter 4(10)
101-L95	Exercise problems: Chapter 4(11)
102-L96	Problems
103-L97	Problems
104-L98	Problems
105-L99	Problems
106-L100	Problems
107-L101	Problems
108-L102	Problems
109- L103	**_Allotting portion for Internal Test-III**
	Internal Test III begins1-4-2018
110- L104	Revision
111- L105	Revisio
112-IT-III	**Internal Test-III**
113- L106	Revision
114- L107	**Test Paper distribution and result analysis**
115- L108	Revision
	Entering Internal Test-III Marks into University portal
116-MT	**Model Testbegins on 12-4-2018**
117-MT	**Model Test**
118-MT	**Model Test**
119-L109	**Model test paper distribution and previous year university question paper discussion**
120-L110	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Analytic Number Theory”
CO1	Knowledge gained about the fundamental Theorem of Arithmetic
CO2	Acquisition of knowledge about Arithmetic functions, Multiplicative functions and Dirichlet Multiplication.

CO3	Students will gain knowledge about Averages of Arithmetical functions, Partial sums of Dirichlet product and Chebyshev's functions .

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Measure & Integration
Course Code	**KMAM43**
Class	II year (2017-2018)
Semester	Even
Staff Name	Mrs. W. Rajammal Ranjitha Mary
Credits	8
L. Hours /P. Hours	8 / WK
Total 120 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 110 Hrs (5 units; 5×22=110; 22Hrs /unit)	

Course Objectives

- Gain the knowledge of measure spaces and measure interruption
- Understanding the concept of lebesgue measure, lebesgue integration and signed measure
- To provide the understanding of general measure spaces

Syllabus

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 7-12-2017
1-L1	Unit-I Introduction
2-L2	Lebesgue Measure
3- L3	Lebesgue outer measure
4-L4	The c-Algebra of Lebesgue Measurable sets
5-L5	Outer and Inner Approximation of Lebesgue Measurable sets
6-L6	Outer and Inner Approximation of Lebesgue Measurable sets
7-L7	Countable Additivity
8-L8	Continuity

9-L9	Borel-Cantelli Lemma
10-L10	Lebesgue Measurable functions
11-L11	Sums, Products
12-L12	Compositions
13-L13	Problems: Chapter 2: 1 to 6
14-L14	Problems: Chapter 2: 6 to 12
15-L15	Problems: Chapter 3: 1 to 6
16-P1	**Inauguration of Mathematics Association**
17-L16	Unit-II Introduction
18-L17	Sequential Pointwise Limits
19-L18	Simple Approximation
20-L19	Simple Approximation
21-L20	Littlewood's Three Principles
22-L21	Littlewood's Three Principles
23-L22	Littlewood's Three Principles
24-L23	Egoroff's Theorem
25-L24	Lusins Theorem
26-L25	Lebesgue Integration
27-L26	The Riemann Integral
28-L27	The Riemann Integral
29-L28	**Allotting portion for Internal Test-I**
	Internal Test I begins 22-01-2018
30-L29	The Lebesgue Integral of a bounded measurable function over a set of finite measure
31- L30	The Lebesgue integral of a measurable nonnegative function
32- IT-1	**Internal Test-I**
33- L31	the general Lebesgue integral
34- L32	Countable Additivity
35- L33	continuity of Integration
36- L34	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
37- L35	Problems: Chapter 4(9 to 12)
38- L36	Problems: Chapter 4(16 to 20)
39- L37	Problems: Chapter 4(28 to 30)
40- P2	**College level meeting/Cell function**
41- L38	Unit-III Introduction
42- L39	Differentiation
43- L40	Integration
44- L41	Continuity of monotone functions
45- L42	Continuity of monotone functions
46- L43	differentiability of monotone function
47- L44	Lebesgue Theorem
48- L45	Functions of bounded variations
49- L46	Functions of bounded variations
50- L47	Jordan's Theorem
51- L48	Absolutely continuous functions
52- L49	Absolutely continuous functions
53- L50	Integrating Derivatives

54- L51	Differentiating Indefinite Integrals
55- P3	**Department Seminar**
56-L52	Differentiating Indefinite Integrals
57-L53	Convex functions
58-L54	Convex functions
59- 55L	Unit-IV Introduction
60- L56	Measure and Integration
61- L57	Measure and Integration
62- L58	**Allotting portion for Internal Test-II**
	Internal Test II begins 26-02-2018
63- L59	Measures and Measurable sets
64- L60	Measures and Measurable sets
65- IT-II	**Internal Test-II**
66- L61	Signed Measures
67- L62	**_Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
68- L63	Signed Measures
69- L64	The Hahn and Jordan Decompositions
70- L65	The Hahn and Jordan Decompositions
71- L66	The Hahn and Jordan Decompositions
72- L67	The Carathéodory Measure induced by an outer Measure
73- L68	The Carathéodory Measure induced by an outer Measure
74- L69	The Carathéodory Measure induced by an outer Measure
75- L70	The construction of outer Measure
76- L71	The construction of outer Measure
77- L72	The construction of outer Measure
78- L73	The Carathéodory-Hahn Theorem
79-L74	The Carathéodory-Hahn Theorem
80-L75	The extension of a Premeasure to a Measure
81-L76	The extension of a Premeasure to a Measure
82-L77	The extension of a Premeasure to a Measure
83-L78	Problems 1, 2, 5
84-L79	Problems 13, 14
85-L80	Problems 18, 19
86-L81	Unit-V Introduction
87-L82	Integration over general Measure spaces
88-L83	Integration over general Measure spaces
89-L84	Integration over general Measure spaces
90-P4	**College level meeting/ function**
91-L85	Integration over general Measure spaces
92-L86	Measurable Functions
93-L87	Measurable Functions
94-L88	Measurable Functions
95-L89	Measurable Functions
96-L90	Integration of Nonnegative Measurable Functions Integration of general Measurable functions
97-L91	Integration of Nonnegative Measurable Functions Integration of general Measurable functions

98-L92	The Radon-Nikodym Theorem
99-L93	The Radon-Nikodym Theorem
100-L94	Problems 1, 2
101-L95	Problems 4, 5
102-L96	Problems 6, 18
103-L97	Problems 19, 21
104-L98	Problems 28, 29
105-L99	Problems 31, 32
106-L100	Problems 33, 49
107-L101	Problems 50
108-L102	Revision
109- L103	**Allotting portion for Internal Test-III**
	Internal Test III begins 1-4-2018
110- L104	Revision
111- L105	Revision
112-IT-III	**Internal Test-III**
113- L106	Revision
114- L107	**Test Paper distribution and result analysis**
115- L108	Revision
	Entering Internal Test-III Marks into University portal
116-MT	**Model Test begins on 12-4-2018**
117-MT	**Model Test**
118-MT	**Model Test**
119-L109	**Model test paper distribution and previous year university question paper discussion**
120-L110	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “<Measure & Integration>”
CO1	Understanding the concept of lesbeague measure, lesbeague integration and signed measure.
CO2	To provide the understanding of general measure spaces.
CO3	Basic knowledge of differentiation, integration and continuity of real functions.
CO4	Knowledge gained about lesbeague theory and general measure spaces and their properties and construction
CO5	Gain the knowledge of measure spaces and measure interruption.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc (Mathematics)
Course Name	Algebra - I
Course Code	**PMAM11**
Class	I year (2017-2018)
Semester	Odd
Staff Name	G.S.GracePrema
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To understand the concepts on group theory
- To classify the properties in Automorphism and Homomorphism
- To study the various proofs of Sylow’s theorems
- To study the properties of finite abelian groups.

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begins on 16.06.2017
1-L1	Unit I – Introduction to group theory: A counting principle
2-L2	Product of two subgroups of a group and its characterisation
3- L3	Finding the order of product of subgroups
4-L4	Finding the order of product of subgroups (Continuation)
5-L5	Cosets, Normal subgroup and basic results
6-L6	Necessary and sufficient condition for a subgroup to be a normal subgroup of the given group
7-L7	Quotient group of a given group by its normal subgroup
8-L8	Order of a quotient group
9-L9	Group homomorphism and examples
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Lemma to define natural homomorphism
12-L11	Kernel of a homomorphism and some results on homomorphisms
13-L12	Proving that the kernel of a homomorphism is a normal subgroup
14-L13	Isomorphism, isomorphic and proving that isomorphic is an equivalence relation
15-L14	First isomorphism theorem on groups
16-L15	simple groups - Cauchy's theorem for Abelian groups
17-L16	Sylow's theorem for Abelian groups
18-L17	Sylow's theorem for Abelian groups continuation
19-L18	Unit II – Automorphism of a group and proving that the set of automorphism is a group
20-L19	The group of inner automorphisms
21-L20	The quotient form of inner automorphims using first isomorphism theorem
22-L21	Relation between order of an element and its image under automorphism
23-L22	Problems on inner automorphism - **Allotting portion for Internal Test-I**
	Internal Test I begins on 31.07.2017
24-L23	Structure of an automorphism of a finite cyclic group

25-L24	Cayley's theorem
26-IT-1	**Internal Test-I**
27-L25	Cayley's theorem continuation
28-L26	Generalization of Cayley's theorem
29-L27	Proof arguments on the generalization of Cayley's theorem
30-L28	Necessary condition for a group cannot be simple - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Applications of Cayley's theorem
32- L30	Solvable groups: Solvability of its subgroups and homomorphic images.
33- L31	Product of solvable groups
34-P2	**College level meeting/Cell function**
35- L32	Sequence of subgroups using commutator subgroup of the given group and its solvability
36- L33	Unit III – Permutation Groups : Construction of permutation group on four symbols
37- L34	Equivalence relation on permutation group
38- L35	orbit of an elements under a map and a cycle of a map
39- L36	Proving that every permutation is the product of its cycles
40- L37	Transposition , even / odd permutation and some results
41- L38	Alternating subgroup of a permutation with index two
42- L39	Conjugacy relation and proving that this is an equivalence relation
43- L40	Normalizer of an element in a group and its property
44- L41	Another counting principle using the order of normalizer – Class equation
45- L42	Application of the class equation
46- L43	Necessary condition for the center of a group to be non-trivial
47- L44	Cauchy's theorem
48- L45	Partition of an integer and examples
49- L46	Finding the number of conjugate classes in a permutation groups
50- L47	Illustration of conjugate classes in a permutation groups using a very special and simple case
51- P3	**Department Seminar**
52- L48	Unit IV – Sylow's theorem with Wielandt's proof
53- L49	First proof of Sylow's theorem
54- L50	*p*-Sylowsubgroub of a group and Second proof of Sylow's theorem
55- L51	Second proof of Sylow's theorem (Continuation)
56-L52	Third proof of Sylow's theorem - **Allotting portion for Internal Test-II**
	Internal Test II begins on 30.08.2017
57-L53	The number $n(k)$ and its formula
58-L54	An existence of *p*-Sylow subgroup of a symmetric groups
59-IT-II	**Internal Test-II**
60- L55	An equivalence relation between two subgroups in a group
61- L56	Double cosets and order of a double coset- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	A gut step in the third proof of Sylow's theorem

63- L58	Second part of Sylow's theorem
64- L59	Lemma to prove the third part of Sylow's theorem
65- L60	Third part of Sylow's theorem
66- L61	Application of second and third part of Sylow's theorem
67- L62	Examples on finding (prime)-Sylow subgroups in finite groups
68- L63	Examples on finding (prime)-Sylow subgroups in finite groups
69- L64	Unit V – Cartesian product of two groups and operations upon it
70- L65	External direct product of two groups and a particular normal subgroup.
71- L66	External direct product of any *n* groups
72- L67	Internal direct product of normal subgroups in a group
73- L68	Relation between normal subgroups that are in internal direct product
74-P4	**College level meeting/ function**
75- L69	An isomorphism between the external and internal direct products
76- L70	Fundamental result on finite abelian group as a direct product of cyclic groups
77- L71	Proof arguments on finite abelian group as a direct product of cyclic groups
78- L72	Invariants of an abelian group
79- L73	Definition of $G(s)$ and its property - **Allotting portion for Internal Test-III**
	Internal Test III begins on 03.10.2017
80- L74	Finding the order of $G(p^m)$
81- L75	Invariants and isomorphisms
82-IT-III	**Internal Test-III**
83- L76	Proving the uniqueness of invariants on isomorphic groups
84- L77	Finding the number of abelian groups of prime power order - **Test Paper distribution and result analysis**
85- L78	Problem discussion on finite abelian groups
	Entering Internal Test-III Marks into University portal
	Model Test begins on 19.10.2017
86- MT	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89- L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra - I"
CO1	Student will be able to identify the concept of Normal groups and Quotients groups
CO2	To explain the concepts of solvable groups and its properties
CO3	Student will be able to analyze Permutation groups and Counting principle

CO4	Student will be able to explain Sylow's theorem and its applications
CO5	To discuss about both internal and external products and study various results on finite abelian groups
Experimental Learning	
EL1	Motivated to solve CSIR-NET questions based on group theory

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis I
Course Code	**PMAM12**
Class	I year (2017-2018)
Semester	Odd
Staff Name	S ShymlalaMalini
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To define a metric space and analyse certain properties on it, such as, closedness, boundedness, perfect sets, open sets, connected sets etc.
- Describe the compact sets and its characterization

Syllabus

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

– Thenumber 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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16.06.2017
1-L1	Unit – I Metric space, distance functions, its examples
2-L2	Types of intervals, convex. Definitions of neighbourhood, limit point and

	isolated point
3- L3	Definitions of interior point, open sets, closed sets and perfect sets.
4-L4	Definitions of bounded and unbounded sets, dense subsets in a metric spaces
5-L5	Characterization of the neighbourhood of a limit points; Theorems to describe neighbourhood as open set
6-L6	Complement of a set; Relation between open and closed sets using complement
7-L7	Union and intersection of collection of open or closed sets.
8-L8	Closure of a set; properties of closure of a set in a metric space; and open relative to subspaces
9-L9	Compact sets and compact relative to subspace and whole space
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Characterization of compact sets
12-L11	Definition of k-cell and proving that every k-cell is compact.
13-L12	Heine-Borel theorem, Weierstrass theorem
14-L13	Uncountability property of Perfect sets in R^k
15-L14	The Cantor set – construction of a cantor set and some results on it
16-L15	Defining connected set using separated sets
17-L16	Whole structure of a connected subset of the real line R^1
18-L17	Unit – IISequences, limit point of a sequence, convergent sequence. Range of a sequence and boundedness; some examples
19-L18	Necessary and sufficient condition of a sequence in a metric space to be convergent;
20-L19	Uniqueness of limit; relation between convergent and boundedness; existence of a convergence sequence to a limit point of a set
21-L20	Algebraic operations on convergent sequences
22-L21	Particular sequence in R^k and its convergency and algebraic operations
23-L22	Subsequences; Existence of a convergent subsequence of a sequence in compact space - **Allotting portion for Internal Test-I**
	Internal Test I begins (31.07.2017)
24-L23	Sub-sequential limits of a sequence and its closed property
25-L24	Cauchy sequence, diameter of a sequence; diameter of a closure of a set.
26-IT-1	**Internal Test-I**
27-L25	Relation between convergent and Cauchy sequence; Cauchy criterion for convergence of a sequence
28-L26	Monotonic sequence: monotonic increasing and decreasing; Problems.
29-L27	Convergence of monotonic sequence in terms of boundedness property
30-L28	Upper limit and lower limit of a sequence; Characterization of upper (and lower) limit and some properties - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Some special sequence (proof using Squeeze lemma)
32- L30	Series and its sum in terms of sequence of partial sums;
33- L31	Cauchy criterion of a series
34-P2	**College level meeting/Cell function**
35- L32	Comparison test; proof argument and testing convergency of series using comparison test
36- L33	Series of non negative terms; Geometric series, Cauchy's condensation test
37- L34	The number *e* and its properties.
38- L35	Unit – III Root test for series
39- L36	Ratio test for series; examples to check the convergence of a series using root

	and ratio tests
40- L37	Criticism about the root and ratio test.
41- L38	Power series, coefficients of the power series. Radius of convergence of a power series
42- L39	Examples to find the radius of convergence for given series
43- L40	Summation of parts and convergence of a series that is a product of bounded and decreasing sequence
44- L41	Alternating series; Leibnitz test for convergence for alternating series
45- L42	Absolute convergent and conditionally convergent of a series and relation between them
46- L43	Problems on absolute convergent series and alternating series
47- L44	Addition and multiplication of series; the Cauchy product of two given series
48- L45	Mertens theorem to check the convergence of Cauchy product of series
49- L46	Abel's theorem.
50- L47	Examples on Cauchy product of series
51- P3	**Department Seminar**
52- L48	Unit – IV Limits of functions; and uniqueness
53- L49	Algebraic properties on limits of functions
54- L50	Continuous function at a point and continuous on a space
55- L51	Continuous function and its limits; Continuity of a composition of functions
56-L52	Proving that the inverse image of an open(a closed) set is open(closed)– **Allotting portion for Internal Test-II**
	Internal Test II begins (30.08.2017)
57-L53	Continuous property on functions from any metric space into Euclidean space R^k
58-L54	Continuity and compactness
59-IT-II	**Internal Test-II**
60- L55	Continuous image of a compact set is compact
61- L56	Boundedness of a function, Continuous mapping of a compact space is bounded –**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Uniformly continuous; Relation between continuity and uniformly continuity
63- L58	Discussion using examples to know the essential of compactness of the domain of a continuous function to become a uniformly continuous
64- L59	Continuity and connectedness; Intermediate value theorem
65- L60	Discontinuities – Left and right limit of a function at a point; Discontinuities of first kind and second kind
66- L61	Problems to check the discontinuities of a function
67- L62	Monotonic functions – monotonically increasing and decreasing;
68- L63	Existence of left and right limits of a monotonic function at every point on intervals
69- L64	Countability of discontinuous point of a monotonic function
70- L65	Unit – V The derivative of a real function
71- L66	Implication between continuity and differentiability of a function
72- L67	Differentiability on algebra of differentiable functions
73- L68	Differentiability of composition of differentiable functions
74-P4	**College level meeting/ function**
75- L69	Examples to know the continuity of first and second derivative of functions
76- L70	Local maximum and local minimum; and its differentiable value
77- L71	Generalized mean value theorem and Mean value theorem

78- L72	Differentiability and monotonicity;
79- L73	Intermediate value theorem - **Allotting portion for Internal Test-III**
	Internal Test III begins (3.10.2017)
80- L74	L'Hospital's rule
81- L75	Problems to test differentiability using L'Hospital's rule
82-IT-III	**Internal Test-III**
83- L76	Derivatives of higher order
84- L77	Taylor's theorem - **Test Paper distribution and result analysis**
85- L78	Problems on Taylor's theorem
	Entering Internal Test-III Marks into University portal
	Model test begins (19.10.2017)
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Analysis I"
CO1	After completing this course, the student will be able to: Attain mastery in metric spaces, Perfect sets and Connected sets.
CO2	Locate Sequence and Series comprising convergence sequences, upper and lower limits
CO3	Demonstrate the various tests for convergence in series
CO4	Enumerate the limits of functions, infinite limits and limit at infinity
CO5	Understand, in details, about continuity and uniform continuity of functions
CO6	Define properties of Differentiation
CO7	Study in detail the Mean value theorem and Taylor's theorem

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analytic Number Theory
Course Code	**PMAM13**
Class	I year (2017-2018)
Semester	Odd
Staff Name	S Vijila Velvet Daisy
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the fundamental theorem of arithmetic and the Euclidean algorithm
- To explain about various kinds of arithmetical functions and its relations
- To find the averages of arithmetical functions
- To understand the prime number theorem and its equivalent forms as well as to derive some of the asymptotic formulas for certain sums

Syllabus

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).

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2017
1-L1	Unit I – Divisibility and properties of divisibility
2-L2	Greatest common divisor of two integers and a theorem representing the structure of g.c.d.
3- L3	Algebraic properties of greatest common divisor and Euclid's lemma
4-L4	Problem discussion
5-L5	Prime numbers and composite numbers; Euclid's theorem
6-L6	Problems on prime and composite numbers
7-L7	The fundamental theorem of arithmetic
8-L8	Some theorems using factorization
9-L9	The series of reciprocals of the primes
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Exercise problem discussion
12-L11	The division algorithm
13-L12	The Euclidean algorithm
14-L13	Problems to finding the g.c.d. using the Euclidean algorithm
15-L14	The greatest common divisor of more than two numbers
16-L15	Exercise problem discussion
17-L16	Exercise problem discussion
18-L17	Unit II – Introduction to arithmetical functions
19-L18	The mobius function and its result
20-L19	More examples and results in arithmetical functions and mobius function
21-L20	The Euler totient function

22-L21	A relation between mobius and Euler totient function
23-L22	Product formula for Euler totient function - **Allotting portion for Internal Test-I**
	Internal Test I begins on 31.07.2017
24-L23	Further properties of Euler totient function
25-L24	The Dirichlet product of arithmetical functions
26-IT-1	**Internal Test-I**
27-L25	Commuativity and associativity of Dirichlet convolution
28-L26	The identity function
29-L27	Dirichlet inverses and its properties
30-L28	The Mobius inversion formula - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	The Mangoldt's function and examples
32- L30	Theorem on Mangoldt's function
33- L31	Exercise problems discussion
34-P2	**College level meeting/Cell function**
35- L32	Exercise problems discussion
36- L33	Unit III – Multiplicative functions and complete multiplicative functions
37- L34	Theorems on Multiplicative functions
38- L35	Multiplicative functions and Dirichlet multiplication
39- L36	Theorems on Dirichlet product of multiplicative functions
40- L37	Exercise problem discussion
41- L38	The inverse of a completely multiplicative function
42- L39	Liouville's function and its sum
43- L40	The divisor functions
44- L41	The inverse of the divisor functions
45- L42	Generalized convolutions and its associative property
46- L43	The Generalized inversion formula
47- L44	Problems on Generalized inversion formula
48- L45	Unit IV – An introduction to averages of arithmetical functions
49- L46	The big oh notation and Asymptotic equality of functions
50- L47	The Euler's summation formula
51- P3	**Department Seminar**
52- L48	Some elementary asymptotic formulas
53- L49	Some elementary asymptotic formulas (continuation)
54- L50	The average order of $d(n)$
55- L51	Dirichlet's asymptotic formula
56-L52	Deriving the Dirichlet's asymptotic formula - **Allotting portion for Internal Test-II**
	Internal Test II begins on 30.08.2017
57-L53	The average order of the divisor functions
58-L54	The average order of the Euler totient functions
59-IT-II	**Internal Test-II**
60- L55	An application to the distribution of lattice points visible from the origin
61- L56	Definitions: Mutually visible points - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Lattice points - theorem

63- L58	Necessary and sufficient condition for two lattice points to be mutually visible
64- L59	Examples on Lattice points
65- L60	Density of the set of lattice points visible form the origin
66- L61	Average order of mobius and Mangoldt's function
67- L62	Exercise problem discussion
68- L63	Exercise problem discussion
69- L64	Unit V – The partial sums of a Dirichlet product
70- L65	Application to mobius and Mangoldt's function
71- L66	The Legendre's identity
72- L67	Theorem to determine an asymptotic formula for $log[x]!$
73- L68	Elementary theorems on the distribution of Prime numbers
74-P4	**College level meeting/ function**
75- L69	Chebyshev's psi-function
76- L70	Chebyshev'stheta-function
77- L71	Inequality on difference of Chebyshev's functions
78- L72	Relations connecting Chebyshev's functions
79- L73	Abel's identity - **Allotting portion for Internal Test-III**
	Internal Test III begins on 03.10.2017
80- L74	Expression of Chebyshev's functions in terms of integrals
81- L75	Equivalent forms of the prime number theorem
82-IT-III	**Internal Test-III**
83- L76	Equivalent forms of the prime number theorem (continuation)
84- L77	Inequalities for $\pi(n)$- **Test Paper distribution and result analysis**
85- L78	Inequalities for p_n
	Entering Internal Test-III Marks into University portal
	Model Test begins on 19.10.2017
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Analytic Number Theory"
CO1	After completing this course, the student will be able to Understand the concepts of divisibility and Primes.
CO2	To explain about various kinds of arithmetical functions and the relation among them
CO3	Able to calculate the averages of several arithmetical functions
CO4	To understand the prime number theorem and its equivalent forms
CO5	To derive some of the asymptotic formulas for certain sums

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Ordinry Differential Equation
Course Code	**PMAM14**
Class	I year (2017-2018)
Semester	Odd
Staff Name	Mr.V.Selvan
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Code

- This course deals with the basic concepts of Ordinary Differential Equations and applies them to various physical problems.
- This course will motivate the students in higher studies and research in applications of ordinary differential equations.

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2017
1-L1	Introduction
2-L2	Second Order linear equations
3- L3	General solution of the Homogeneous equations
4-L4	General solution of the Homogeneous equations
5-L5	General solution of the Homogeneous equations
6-L6	The use of a known solution to find another
7-L7	The use of a known solution to find another
8-L8	The use of a known solution to find another
9-L9	The method of variation of parameters
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	The method of variation of parameters
12-L11	The method of variation of parameters
13-L12	The method of variation of parameters
14-L13	Power series solutions
15-L14	Power series solutions
16-L15	A review of power series solutions
17-L16	A review of power series solutions
18-L17	A review of power series solutions
19-L18	Series solution of first order equations
20-L19	Series solution of first order equations
21-L20	Series solution of first order equations
22-L21	Series solution of first order equations
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins(31-07-2017)
24-L23	Second order equations
25-L24	Second order equations
26-IT-1	**Internal Test-I**
27-L25	Second order equations
28-L26	Ordinary points
29-L27	Ordinary points
30-L28	**- Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Ordinary points
32- L30	Regular singular points
33- L31	Regular singular points
34-P2	**College level meeting/Cell function**

35- L32	Regular singular points
36- L33	Regular singular points
37- L34	Legendre polynomials
38- L35	Legendre polynomials
39- L36	Legendre polynomials
40- L37	Properties of Legendre Polynomials
41- L38	Properties of Legendre Polynomials
42- L39	Properties of Legendre Polynomials
43- L40	Bessel functions
44- L41	Bessel functions
45- L42	Bessel functions
46- L43	Bessel functions
47- L44	The Gamma functions
48- L45	The Gamma functions
49- L46	The Gamma functions
50- L47	The Gamma functions
51- P3	**Department Seminar**
52- L48	Properties of Bessel functions
53- L49	Properties of Bessel functions
54- L50	Properties of Bessel functions
55- L51	Properties of Bessel functions
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(30-08-2017)
57-L53	Linear systems
58-L54	Linear systems
59-IT-II	**Internal Test-II**
60- L55	Linear systems
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Linear systems
63- L58	Linear systems
64- L59	Problems
65- L60	Problems
66- L61	Problems
67- L62	Problems
68- L63	Homogeneous linear systems with constant coefficients
69- L64	Homogeneous linear systems with constant coefficients
70- L65	Homogeneous linear systems with constant coefficients
71- L66	Homogeneous linear systems with constant coefficients
72- L67	Homogeneous linear systems with constant coefficients
73- L68	Homogeneous linear systems with constant coefficients
74-P4	**College level meeting/ function**
75- L69	Homogeneous linear systems with constant coefficients
76- L70	Homogeneous linear systems with constant coefficients
77- L71	Homogeneous linear systems with constant coefficients
78- L72	Problem discussion
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins 03-10-2017

80- L74	Problem discussion
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test (19-10-2017)**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 19-10-2017

Course Outcomes

Learning Outcomes	**COs** of the course "<Course Name>"
CO1	Recall the basic concepts of ordinary differential equations, Solve the initial value problems for the homogeneous equations and hence evaluate its independency using wronskian.
CO2	Differentiate homogeneous, non-homogeneous and homogeneous with analytic coefficients equations. Solve homogeneous equations with analytic coefficients.
CO3	Identify the regular singular points for both linear and second order ordinary differential equations and hence solve them.
CO4	compute the Bessel's function of zero order and order α.
CO5	Illustrate the concept of variable separation, exact equation and successive approximation and derive the Lipchitz condition.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Numerical Analysis
Course Code	**PMAM15**
Class	I year(2017-2018)
Semester	Odd
Staff Name	G Jeya Kumar J Vijaya Xavier Parithipan
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

Numerical Analysis deals with numerical solutions of certain problems of Mathematics. In this course we study iterative methods to solve nonlinear equations in one variable, methods to solve system of equations, interpolation problems and Numerical solutions of differential equations.

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16.06.2017
1-L1	Unit I – Introduction to interpolation
2-L2	Newton's forward interpolation formula – Algorithm
3- L3	Problem discussion on Newton's forward interpolation formula
4-L4	Newton's backward interpolation formula
5-L5	Problem discussion on Newton's backward interpolation formula
6-L6	Central Difference Interpolation Formula
7-L7	Gauss forward interpolation formula
8-L8	Gauss backward interpolation formula
9-L9	Stirling's formula
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Bessel's Formula
12-L11	Laplace-Everett's formula
13-L12	Lagrange's interpolation formula
14-L13	Problems on Lagrange's interpolation formula
15-L14	Divided differences formulae; relation between divided differences and forward differences
16-L15	Newton's Divided differences formula
17-L16	Inverse interpolations: Lagrange's method, iterative method
18-L17	Hermite's Interpolating polynomial
19-L18	Unit II – Numerical differentiation: an introduction
20-L19	Derivatives using Newton's forward difference formula
21-L20	Derivatives using Newton's forward difference formula
22-L21	Problems to find derivatives using Newton's forward difference formula
23-L22	Problem discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins31.07.2017
24-L23	Problems to find derivatives using Newton's forward difference formula
25-L24	Problems to find derivatives using Newton's forward difference formula

26-IT-1	**Internal Test-I**
27-L25	Derivatives using Newton's backward difference formula
28-L26	Derivatives using Newton's backward difference formula
29-L27	Problems to find derivatives using Newton's backward difference formula
30-L28	Derivatives using central difference formulae (Stirling's formula) - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Algorithm on derivatives using Stirling's formula
32- L30	Problems to find derivatives using Stirling's formula
33- L31	Maxima and minima of the interpolating polynomial
34-P2	**College level meeting/Cell function**
35- L32	Problems in maxima and minima of the interpolating polynomial
36- L33	Unit III – Introduction to Numerical integration
37- L34	Newton-Cote's quadrature formula
38- L35	Trapezoidal Rule
39- L36	Geometrical interpretation of Trapezoidal rule and Error in Trapezoidal rule
40- L37	Simpson's one third rule: Algorithm
41- L38	Finding truncation error in Simpson's formula
42- L39	Simpson's three eight rule: Algorithm
43- L40	Weddle's rule
44- L41	Romberg's method
45- L42	Problems on numerical integration
46- L43	Two-point Gaussian Quadrature formulae
47- L44	Gaussian three-point quadrature formula
48- L45	Trapezoidal rule for double integrals
49- L46	Simpson's one-third rule for double integrals
50- L47	Problems solving for double integrals
51- P3	**Department Seminar**
52- L48	Unit IV – Introduction to numerical solutions of ordinary differential equations
53- L49	Taylor's series method: Algorithm
54- L50	Problems on Taylors's series method
55- L51	Picard's iteration method
56-L52	Picard's iteration method–**Allotting portion for Internal Test-II**
	Internal Test II begins30.08.2017
57-L53	Euler's algorithm
58-L54	Problems using Euler's method
59-IT-II	**Internal Test-II**
60- L55	Modified Euler's method
61- L56	Solving problems and comparing the difference in Euler's and Modified Euler's method - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Runge-Kutta method
63- L58	First order and second order Runge-Kutta method
64- L59	Problem discussion
65- L60	Third order and fourth order Runge-Kutta method
66- L61	Problems on Third order Runge-Kutta method
67- L62	Fourth order Runge-Kutta method
68- L63	Problems on fourth order Runge-Kutta method

69- L64	Unit V – Predictor corrector methods: introduction
70- L65	Milne's predictor method
71- L66	Problems using Milne's predictor method
72- L67	Milne's Corrector method
73- L68	Problems using Milne's corrector method
74-P4	**College level meeting/ function**
75- L69	Problem discussion on Milne's method
76- L70	Problem discussion on Milne's method
77- L71	Adams-Bashforth method: an introduction
78- L72	Adams-Bashforth predictor formula
79- L73	Problems using Adams-Bashforth predictor formula - **Allotting portion for Internal Test-III**
	Internal Test III begins03.10.2017
80- L74	Adams-Bashforth corrector formula
81- L75	Problems using Adams-Bashforth predictor formula
82-IT-III	**Internal Test-III**
83- L76	Problems using Adams-Bashforth method
84- L77	Problems discussion - **Test Paper distribution and result analysis**
85- L78	Problems using Adams-Bashforth method
	Entering Internal Test-III Marks into University portal
	Model Test begins on 19.10.2017
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Numerical Analysis"
CO1	Demonstrate understanding of common numerical methods and used to obtain approximate solutions to otherwise intractable mathematical problems
CO2	Analyse and evaluate the accuracy of common numerical methods
CO3	Compare different algorithms with respect to accuracy and efficiency solution
CO4	Analyse the errors obtained in the numerical solution of problems
CO5	Using appropriate numerical methods , determine the solutions to given non-linear equations
CO6	Using appropriate numerical methods , determine approximate solutions to ordinary differential solutions
Integrated Activity	
IA1	Determine approximate numerical solutions to mathematical problems which cannot always be solved by conventional analytical techniques

IA2	Demonstrate the important of selecting the right numerical technique for a particular application.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Operations Research
Course Code	**KMAE31**
Class	II year (2017-2018)
Semester	Odd
Staff Name	Mrs. S. Vijila Velvet Daisy
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

Text: Operations Research Principles and Applications-G.Srinivasan-PHI learning private limited-New Delhi-EEE edition.

Unit 1: Integer Programming.(Chapter 7 and all exercise problems)

Unit 2: Network Problems-Minimum spanning tree problem-The shortest path problem-The maximum flow problem-The minimum cost problem.(Chapter 8: Section 8.5 to 8.9 and all exercise problems)

Unit 3: Travelling salesman and distribution problem. (Chapter 9 and all exercise problems)

Unit 4: Basic Queueing models. (Chapter 11 and all exercise problems)

Unit 5: Deterministic inventory models. (Chapter 13 and all exercise problems) 3.5. Paper-14-Project

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2017
1-L1	Introduction

2-L2	Integer Programming
3- L3	Integer Programming
4-L4	Integer Programming
5-L5	Integer Programming
6-L6	Integer Programming
7-L7	Integer Programming
8-L8	Integer Programming
9-L9	Integer Programming
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Exercise Problems
12-L11	Exercise Problems
13-L12	Network Problems
14-L13	Network Problems
15-L14	Network Problems
16-L15	Minimum spanning tree problem
17-L16	Minimum spanning tree problem
18-L17	Minimum spanning tree problem
19-L18	Minimum spanning tree problem
20-L19	The shortest path problem
21-L20	The shortest path problem
22-L21	The shortest path problem
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins on (31-07-2017)
24-L23	The shortest path problem
25-L24	The shortest path problem
26-IT-1	**Internal Test-I**
27-L25	The maximum flow problem
28-L26	The maximum flow problem
29-L27	The maximum flow problem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	The maximum flow problem
32- L30	The maximum flow problem
33- L31	The minimum cost problem
34-P2	**College level meeting/Cell function**
35- L32	The minimum cost problem
36- L33	The minimum cost problem
37- L34	The minimum cost problem
38- L35	Exercise Problems
39- L36	Exercise Problems
40- L37	Travelling salesman and distribution problem
41- L38	Travelling salesman and distribution problem
42- L39	Travelling salesman and distribution problem
43- L40	Travelling salesman and distribution problem
44- L41	Travelling salesman and distribution problem
45- L42	Travelling salesman and distribution problem
46- L43	Travelling salesman and distribution problem
47- L44	Travelling salesman and distribution problem

48- L45	Travelling salesman and distribution problem
49- L46	Travelling salesman and distribution problem
50- L47	Travelling salesman and distribution problem
51- P3	**Department Seminar**
52- L48	Exercise Problems
53- L49	Exercise Problems
54- L50	Exercise Problems
55- L51	Exercise Problems
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins(30-08-2017)
57-L53	Basic Queueing models
58-L54	Basic Queueing models
59-IT-II	**Internal Test-II**
60- L55	Basic Queueing models
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Basic Queueing models
63- L58	Basic Queueing models
64- L59	Basic Queueing models
65- L60	Basic Queueing models
66- L61	Basic Queueing models
67- L62	Basic Queueing models
68- L63	Basic Queueing models
69- L64	Basic Queueing models
70- L65	Exercise Problems
71- L66	Exercise Problems
72- L67	Exercise Problems
73- L68	Exercise Problems
74-P4	**College level meeting/ function**
75- L69	Deterministic inventory models
76- L70	Deterministic inventory models
77- L71	Deterministic inventory models
78- L72	Deterministic inventory models
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins (03-10-2017)
80- L74	Deterministic inventory models
81- L75	Exercise Problems
82-IT-III	**Internal Test-III**
83- L76	Exercise Problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Exercise Problems
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test begins on 19-10-2017**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**

	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Operations Research"
CO1	To modify real life into Standard Mathematical Models.
CO2	To know classification of different structured problems.
CO3	Basic computing knowledge and techniques at undergraduate level.
CO4	Identification of actual problems and its equivalent mathematical models.
CO5	Application to different optimization techniques in real life situations.
CO6	Knowledge gained in utilization of Optimum Resources
CO7	To learn different optimization techniques.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Complex Analysis
Course Code	KMAM31
Class	II year (2017-2018)
Semester	Odd
Staff Name	Dr. J. Vijaya Xavier Parthipan
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

Paper-10-Complex Analysis

Text: Complex Analysis-Lars V. Ahlfors-Tata McGraw Hill(Third Edition)

Unit 1: Analytic functions-Polynomials-Power series. (Chapter 2: Section 1.1 to 2.5) Problems: Section 1.2(1 to 7), Section 1.4(1 to 6). Section 2.2(1 to 5) and Section 2.4(1 to 4)

Unit 2: Exponential and Trigonometric functions Arcs and closed curves=-Analytic functions in regions-Conformal mapping-Linear transformations-Symmetry (Chapter 2: Section 3.1 to 3.4 and Chapter 3: Section 2.1 to 3.3) Problems: Chapter 2- Section 3.2(1 to 4) and Chapter 3- Section 3.1(1 to 4). Section 3.2(1 to 3). Section 3.3(1 to 7)

Unit 3: Oriented circles-Families of circles-Line integrals, Rectifiable arcLine integrals as functions of arcs-Cauchy's theorem for a rectangleCauchy's theorem in a disc. (Chapter 3: Section 3.4.3.5 and Chapter 4: Section 1.1 to 1.5) Problems: Chapter 3- Section 3.5(1 to 6) and Chapter 4- Section 1.3(1 to 7)

Unit 4: Cauchy's integral formula: Index of a point-the integral formulaHigher derivatives-Taylor's theorem-Zeroes and Poles-the local mapping (Chapter 4: Section 2.1 to 3.3) Problems: Chapter 4- Section 2.2(1 to3), Section 2.3(1) and Section 3.2(1to 4)

Unit 5: The maximum principle-Calculus of Residues-The argument principle-Evaluation of definite integrals. (Chapter 4: Section 3.4 and 5.1 to 5.3) Problems: Chapter 4. Section 3.4(1 and 2). Section 5.2(1 to 3) and Section 5.3 (1 to 3)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-06-2017
1-L1	Unit-I Introduction
2-L2	Analytic functions
3- L3	Analytic functions
4-L4	Polynomials
5-L5	Polynomials
6-L6	Power series
7-L7	Power series
8-L8	Problems: Section 1.2(1 to 4)
9-L9	Problems: Section 1.2(3 to 7)
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Problems: Section 1.4(1 to 6)
12-L11	Problems: Section 2.2(1 to 5)
13-L12	Problems: Section 2.4(1 to 4)
14-L13	Unit-II Introduction
15-L14	Exponential functions
16-L15	Exponential functions
17-L16	Trigonometric functions
18-L17	Trigonometric functions
19-L18	Arcs and closed curves
20-L19	Arcs and closed curves
21-L20	Analytic functions in regions
22-L21	Analytic functions in regions
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins on 31-07-2017
24-L23	Conformal mapping
25-L24	Conformal mapping
26-IT-1	**Internal Test-I**
27-L25	Linear transformations
28-L26	Linear transformations
29-L27	Symmetry
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Symmetry
32- L30	Problems: Chapter 2- Section 3.2(1 to 4)

33- L31	Problems: Chapter 3- Section 3.1(1 to 4)
34-P2	**College level meeting/Cell function**
35- L32	Problems: Chapter 2- Section 3.2(1 to 3)
36- L33	Problems: Chapter 2- Section 3.3(1 to 7)
37- L34	Unit-III Introduction
38- L35	Oriented circles
39- L36	Families of circles
40- L37	Line integrals
41- L38	Rectifiable arc
42- L39	Line integrals as functions of arcs
43- L40	Cauchy's theorem for a rectangle
44- L41	Cauchy's theorem in a disc
45- L42	Problems: Chapter 3- Section 3.5(1 to 6)
46- L43	Problems: Chapter 4- Section 1.3(1 to 7)
47- L44	Unit-IV Introduction
48- L45	Cauchy's integral formula
49- L46	Index of a point
50- L47	the integral formula-
51- P3	**Department Seminar**
52- L48	Higher derivatives
53- L49	Taylor's theorem
54- L50	Zeroes and Poles
55- L51	the local mapping
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins on 30-08-2017
57-L53	Problems: Chapter 4- Section 2.2(1 to3) & Section 2.3(1)
58-L54	Problems: Chapter 4- Section 3.2(1to 4)
59-IT-II	**Internal Test-II**
60- L55	Problems
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Unit-V Introduction
63- L58	The maximum principle
64- L59	Calculus of Residues
65- L60	Calculus of Residues
66- L61	Calculus of Residues
67- L62	The argument principle
68- L63	The argument principle
69- L64	The argument principle
70- L65	The argument principle
71- L66	Evaluation of definite integrals
72- L67	Evaluation of definite integrals
73- L68	Evaluation of definite integrals
74-P4	**College level meeting/ function**
75- L69	Problems: Chapter 4. Section 3.4(1 and 2)
76- L70	Problems: Chapter 4. Section 5.2(1 to 3)
77- L71	Problems: Chapter 4. Section 5.3 (1 to 3)
78- L72	Problems

79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins on 3-10-2017
80- L74	Revision
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test begins on 19-10-2017**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course "<Complex analysis>"
CO1	To gain advanced knowledge about Complex functions and Analytic functions as mappings
CO2	To understand the concept of Analyticity Conformality, Linear Transformation and Complex Integration.
CO3	Acquisition of solving problems in Complex Integration and boundary value problems.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Differential Geometry
Course Code	**KMAM32**
Class	II year (2017-2018)
Semester	Odd
Staff Name	Mrs. W. Rajammal Ranjitha Mary
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To be able to understand the fundamental theorem for plane curves
- To understand fundamental abstract topological structures
- To improve problem solving skills
- To introduce essential ideas and methods of differential geometry

Syllabus

DIFFERENTIAL GEOMETRY

Unit I: The theory of space curves – Definitions , Arc length – Tangent – Normal and Binormal – Curvature and Torsion.

Unit II: Contact between curves and surfaces – Tangent Surface – Involutes and evolutes –

Helices

Unit III: Definition of a surface – Curves on a surface – Helicoids – Metric – Direction

Coefficients.

Unit IV: Families of curves – Geodesics , Canonical geodesic equation, Normal Property of

geodesics (Christoffel symbols not included).

Unit V: Geodesic curvature , The Second Fundamental form – Principal Curvature – Lines of

Curvature (Dupin's indicatrix not included).

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester begins on 16-06-2017
1-L1	UNIT I - THE THEORY OF SPACE CURVES- Introduction of Space curves
2-L2	Definitions of space curves
3- L3	Arc Length
4-L4	Problems on Arc Length
5-L5	Tangent – unit tangent vector
6-L6	Osculating plane
7-L7	Problems on Osculating plane
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Normal - Unit normal vector –Normal plane
10- L9	Theorems on Osculating plane and Normal plane
11-L10	Curvatures of a curve
12-L11	Behaviour of a curve in the neighbourhood of a point on it.
13-L12	Torsion of a curve
14-L13	Curvature &torsion of a curve given as the intersection of two surfaces.
15-L14	UNITII: CONTACT BETWEEN CURVES AND SURFACES - Introduction
16-L15	Osculating Circle and Osculating Sphere
17- L16	Locus of centre of Spherical curvature
18- L17	Tangent surface of a curves
19- L18	Involutes of a curve
20- L19	Evolutes of a curve
21- L20	Helices - **Allotting portion for Internal Test-I**
	Internal Test I begins on 31-07-2017
22- L21	To find the equation of the Involutes
23- IT-1	**Internal Test-I**
24- L22	To find the equation of the Evolutes

25- L23	Definition of circular helices and cylindrical helices
26- L24	Characteristic property of Helices- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Circular helix and Cylindrical helix
28- L26	Relation between the curvatures of a general helix and its projection on a plane orthogonal to its axis
29- L27	**UNIT III:** DEFINITION OF A SURFACE - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Definition of a curve on a surface
32-L29	Definition Of Parametric Equations – Proper Transformation
33-L30	Equivalent relations of two surfaces
34- L31	Curves on surface
35- L32	Parametric curves and orthogonal to each other
36- L33	Definitions of a Helicoids
37- L34	Right helicoids and General helicoids
38-L35	Definition of Metric
39- L36	Problems on Metric
40- L37	Angle between Parametric curves
41- L38	Elements of area
42-P3	**Department Seminar**
43- L39	Direction coefficients
44- L40	UNIT IV- FAMILIES OF CURVES – Introduction
45- L41	General significance of the sense of the tangent vector
46- L42	Orthogonal trajectories
47- L43	Discuss about the Orthogonal trajectories **Allotting portion for Internal Test-II**
	Internal Test II begins on 30-08-2017
48- L44	Problems on Orthogonal trajectories
49-IT-II	**Internal Test-II**
50-L45	Double family of curves
51- L46	Geodesics - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Derivation of equations to Geodesics
53- L48	Problems on Geodesics
54- L49	Problems on Geodesics
55- L50	Canonical geodesics equations
56- L51	Normal property of Geodesics
57- L52	Equivalent statement of the normal property
58- L53	UNIT V- GEODESIC CURVATURE-Introduction
59-P4	**College level meeting/ function**
60- L54	Examples on Geodesic curvature
61- L55	Problems onGeodesic curvature
62- L56	Second Fundamental form
63- L57	Mensniersthrorem
64- L58	Principal Curvature - **Allotting portion for Internal Test-III**
	Internal Test III begins on 3-10-2017
65- L59	Lines of Curvature Rodrigue's formula
66- L60	Euler's theorem

67-IT-III	**Internal Test-III**
68- L61	Liouville’s formula
69- L62	Geometrical interpretation of the second fundamental form
70- L63	Classification of point on a surface - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test begins on 19-10-2017**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course “Differential Geometry”
CO1	Appreciation and understanding of what makes properties and arguments geometric
CO2	Understanding between intrinsic and extrinsic properties
CO3	Define the equivalence of two curves
CO4	Define surfaces and their properties
CO5	Express tangent spaces of surfaces

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Topology
Course Code	**KMAM33**
Class	II year (2017-2018)
Semester	Odd
Staff Name	Dr. J. Suresh Suseela
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

Text: Topology (Second Edition) James R. Munkres, Printice-Hall of India Private Limited

Unit 1: Topological spaces-closed sets and limit points. (Chapter 2: Section 12 to 17)

Problems: Section 13(all exercise problems), Section 16(1 to 6) and Section 17

(1 to 15)

Unit 2: Continuous functions-Product topology-Quotient topology. (Chapter 2: Section 18, 19 and 22) Problems: Section 18(1 to 8), Section 19(1 to 9) and Section 22(1 to 5)

Unit 3: Connected spaces-Compact spaces. (Chapter 3: Section 23 and 26) Problems: Section 23(1 to 6) and Section 26(1 to 9)

Unit 4: The Countability Axioms - The separation Axioms-Normal spaces. (Chapter 4: Section 30 to 32) Problems: Section 30(1 to 5), Section 31(1 to 7) and Section 32(1 to 7)

Unit 5: The Urysohn Lemma-The UrysohnMetrization Theorem-The Tietze Extension Theorem (Chapter 4: Section 33 to 35) Problems: Section 331 to 5) and Section 35(1 to 4)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-06-2017
1-L1	Introduction
2-L2	Topological spaces

3- L3	Topological spaces
4-L4	Topological spaces
5-L5	Topological spaces
6-L6	Topological spaces
7-L7	closed sets and limit points
8-L8	closed sets and limit points
9-L9	closed sets and limit points
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Problems: Section 13(all exercise problems)
12-L11	Problems: Section 13(all exercise problems)
13-L12	Continuous functions-Product topology
14-L13	Continuous functions-Product topology
15-L14	Continuous functions-Product topology
16-L15	Quotient topology
17-L16	Quotient topology
18-L17	Quotient topology
19-L18	Quotient topology
20-L19	Problems: Section 18(1 to 4)
21-L20	Problems: Section 18(5 to 8)
22-L21	Problems: Section 19(1 to 4)
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins on 31-07-2017
24-L23	Problems: Section 22(1 to 5)
25-L24	Problems: Section 18(5 to 8)
26-IT-1	**Internal Test-I**
27-L25	Connected spaces
28-L26	Connected spaces
29-L27	Connected spaces
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Compact spaces
32- L30	Compact spaces
33- L31	Compact spaces
34-P2	**College level meeting/Cell function**
35- L32	Compact spaces
36- L33	Compact spaces
37- L34	Problems: Section 23(1 to 3)
38- L35	Problems: Section 23(4 to 6)
39- L36	Problems: Section 26(1 to 4)
40- L37	Problems: Section 26(5 to 9)
41- L38	The Countability Axioms
42- L39	The Countability Axioms
43- L40	The Countability Axioms
44- L41	The Countability Axioms
45- L42	The Countability Axioms
46- L43	The separation Axioms
47- L44	The separation Axioms
48- L45	The separation Axioms

49- L46	The separation Axioms
50- L47	Normal spaces
51- P3	**Department Seminar**
52- L48	Normal spaces
53- L49	Normal spaces
54- L50	Normal spaces
55- L51	Normal spaces
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins on 30-08-2017
57-L53	Problems: Section 30(1 to 3)
58-L54	Problems: Section 30(4, 5)
59-IT-II	**Internal Test-II**
60- L55	Problems: Section 31(1 to 4)
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems: Section 31(5 to 7)
63- L58	Problems: Section 32(1 to 4)
64- L59	Problems: Section 32(5 to 7)
65- L60	The Urysohn Lemma
66- L61	The Urysohn Lemma
67- L62	The Urysohn Lemma
68- L63	The Urysohn Lemma
69- L64	The UrysohnMetrization Theorem
70- L65	The UrysohnMetrization Theorem
71- L66	The UrysohnMetrization Theorem
72- L67	The Tietze Extension Theorem
73- L68	The Tietze Extension Theorem
74-P4	**College level meeting/ function**
75- L69	The Tietze Extension Theorem
76- L70	The Tietze Extension Theorem
77- L71	Problems: Section 33(1 to 3)
78- L72	Problems: Section 33(4, 5)
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins (03-10-2017)
80- L74	Problems: Section 35(1 ,2)
81- L75	Problems: Section 35(3, 4)
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test begins on 19-10-2017**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06-11-2017

Course Outcomes

Learning Outcomes	**COs** of the course "Topology"
CO1	To distinguish space by means of Simple Topological invariants.
CO2	Gain the knowledge of constructing spaces by giving and to prove that in certain case, that the result is homeomorphic to standard spaces.
CO3	Knowledge gained about Topological Spaces and the theories based on these Spaces.
CO4	Basic knowledge in Set Theory and Analysis at undergraduate level.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Topology II
Course Code	**PMAM 44**
Class	II year (2018-2019)
Semester	Even
Staff Name	J. Subhashini
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- The course will enable the students to master the basic concepts of topology. The course deals with various topics in topological spaces like compactness, connectedness, separation axioms, countability axioms and metrizability of topological spaces. The learner will be able to understand and appreciate that the Topological spaces are the generalization of the concept of metric spaces. The inherent complexity of topological spaces as the most abstract human imagination can be appreciated by the learner. The intrinsic and novel methods of proof adopted can be a source of inspiration for solving problems in every walk of life.

Syllabus

UnitI: **Separation axioms.:** The countability axioms – Separationaxioms.

Chapter 4: Sections 30, 31.

Problems: Section 30: 2,3 and Section 31: 1-3.

UnitII: **The Urysohn lemma :**Normal spaces – The Urysohnlemma.

Chapter 4: Sections 32, 33.

Problems: Section 32: 1, 3, 4 and Section 33: 1-2.

UnitIII: **Urysohn and Tietz extension theorem :**The Urysohn metrization theorem – The Tietz extensiontheorem.

Chapter 4: Sections 34, 35.

Problems: Section 34: 1, 3 and Section 35: 1, 3.

UnitIV: **The Tychonofftheorem :**TheTychonoff theorem – Local finiteness.

Chapter 5: Sections 37 and Chapter 6: Section 39

Problems: Section 37: 1,2 and Section 39: 3,5.

UnitV: **Baire Spaces.:**BaireSpaces.

Chapter 8: Sections 48.

Problems: Section 48: 1, 3, 4, 6.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03.12.2018
1-L1	Unit I Definition in countable axioms and examples
2-L2	Theorem in countable axioms
3- L3	Theorem in countable axioms
4-L4	Theorem in countable axioms
5-L5	Definition in separation axioms
6-L6	Theorems in separation axioms
7-L7	Theorems in separation axioms
8- P1	**Inauguration of Mathematics Association**
9- L8	Theorems in separation axioms
10- L9	Theorems in separation axioms
11-L10	Problems in countable axioms
12-L11	Problems in countable axioms
13-L12	Problems in separation axioms
14-L13	Problems in separation axioms
15-L14	Unit II Theorems in normal spaces
16-L15	Theorems in normal spaces
17- L16	Theorems in normal spaces
18- L17	Theorems in normal spaces
19- L18	Problems in normal spaces
20- L19	Problems in normal spaces
21- L20	Countable axioms to normal spaces- **Allotting portion for Internal Test-I**
	Internal Test I begins on (18.01.2019)
22- L21	Urysohn lemma-Theorem
23- IT-1	**Internal Test-I**

24- L22	Urysohn lemma-Theorem
25- L23	Theorems using Urysohn lemma
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Theorems using Urysohn lemma
28- L26	Problems using Urysohn lemma
29- L27	Unit III Introduction to Urysohn metrization theorem
30- P2	**College level meeting/Cell function**
31-L28	Proof of Urysohn metrization theorem
32-L29	Proof of Urysohn metrization theorem
33-L30	Proof of Urysohn metrization theorem
34- L31	Imbedding theorem
35- L32	Tietz extension theorem
36- L33	Tietz extension theorem
37- L34	Tietz extension theorem
38- L35	Problems using Urysohn metrization theorem
39- L36	Problems using Urysohn metrization theorem
40- L37	Problems using Tietz extension theorem
41- L38	Problems using Tietz extension theorem
42-P3	**Department Seminar**
43- L39	Problems using Tietz extension theorem
44- L40	Unit IV Preliminaries in Tychnoff theorem
45- L41	Lemma1 for Tychnoff theorem
46- L42	Lemma2 for Tychnoff theorem
47- L43	Urysohn lemma to Tietz extension theorem - **Allotting portion for Internal Test-II**
	Internal Test II begins (25.02.2019)
48- L44	Proof of Tychnoff theorem
49-IT-II	**Internal Test-II**
50-L45	Proof of Tychnoff theorem
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Definition of Locally finite and theorems
53- L48	Theorems in Locally finite
54- L49	Theorems in Locally finite
55- L50	Introduction of Baire spaces and examples
56- L51	Lemma in Baire spaces
57- L52	Baire category theorem
58- L53	Unit V Theorem in Baire spaces
59-P4	**College level meeting/ function**
60- L54	Theorem in Baire spaces
61- L55	Theorem in Baire spaces
62- L56	Problems in Baire spaces
63- L57	Problems in Baire spaces
64- L58	Tychnoff theorem to Baire spaces- **Allotting portion for Internal Test-III**
	Internal Test III begins (22.03.2019)
65- L59	Exercise problems for revision
66- L60	Exercise problems for revision

67-IT-III	**Internal Test-III**
68- L61	Exercise problems for revision
69- L62	Exercise problems for revision
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test(08.04.2019)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course “<Topology II>”
CO1	Improves the understanding of Seperation axioms
CO2	Solved problems in Sepeeration axioms
CO3	Get knowledge to do research in these areas
CO4	Gain knowledge on metrization of topological spaces and compactness of product spaces.
CO5	Conceptualize more intrinsic and inherent properties like countability axioms, separation axioms and separability.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc (Mathematics)
Course Name	Calculus of Variations and Integral Equations.
Course Code	**PMAE32**
Class	II year (2018-2019)
Semester	Odd
Staff Name	
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3Hrs Dept. Meetings-0Hrs College Meetings-0Hrs Remaining 54Hrs (5 units; 5×10.8=54; 10.8Hrs /unit)	

Course Objectives

- The objective of this paper is to place at the disposal of the student, the basis of an intelligent working knowledge of a number of facts and techniques which are useful in varied fields of application.
- To impart analytical ability in solving variational problems and Integral equation.
- To acquire the knowledge of solving problems in the fields of mechanics and mathematical physics.

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – III / Elective-2(b)

CALCULUS OF VARIATIONS AND INTEGRAL EQUATIONS

UNIT I -Maxima and Minima

Calculus of Variations and Applications– Maxima and Minima– The simplest case– Illustrative examples.

Exercises problems: Chapter 2(2, 6, 8 and 18)
Sections: 2.1-2.4
UNIT II-Lagrange's Multipliers
Thevariational notations– The more general case – Constraints and Lagrange'sMultipliers – Variable end points.
Exercises problems: Chapter 2(19, 20 and 21)

UNIT III - Integral Equations
Integral Equations – Introduction –Relation between differential and integral equations – The Green's function.
Exercises problems: Chapter 3(1,9, 11)
UNIT IV - Fredholm equations
Linear Equations in cause and effect- The influence function -Fredholm equations with separable kernels – Illustrative Examples.
Exercises problems: Chapter 3(40 and 43)
Unit V - Hilbert Schmidt theory
Hilbert Schmidt theory – Iterative methods for solving equations of second kind.
Exercises problems: Chapter 3(52 and 53)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2018
1-L1	Unit –I -Introduction of calculus of variation. And explain the concept of maxima and minima.
2-L2	Definition of maxima and minima and some examples.
3- L3	Derivation of maxima and minima for several variabels.
4-L4	Explain the simplest case- Euler equation.
5-L5	Derivation of various forms of euler equation.
6-L6	Solutions of euler equation and problems.
7-L7	Examples and some problems related to euler equation.
8-L8	Problems of an euler equation.
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9-L9	Explain natural boundary conditions.
10-L10	Natural boundary conditions derivations.
11-L11	Transition problems derivations. And excersise problems **Seminar by student.**
12-L12	Unit- II- Introduction to variational notation
13-L13	Variational notations derivations.
14-L14	Continuation of Variational notations derivations.
15-L15	Problems related to Variational notations.-**Allotting portion for Internal Test I.**
16-L16	Variational notations problems continued.
17-IT-1	**Internal Test-I 30-07-2018**
17-L17	Introduction to more general case.
18-L18	Derivation of ostrogradsky equation. - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
19-L19	Derivation of ostrogradsky equation continued.
20-L20	Problems related to the more general case.
21-L21	Introduce the concept of Constraints and Lagrange multipliers.
22- P2	**College level meeting/Cell function**
22-L22	Derivations of Lagrange multipliers.
23-L23	Problems of Lagrange multipliers.
24-L24	Problems of Lagrange multipliers. And Unit Test

25-L25	Derivation and problems of variable end points
26-L26	Exercise problems.
27-L27	Variable end points continuation.
29-L28	Variable end points continuation.
30-L29	Unit-III – Introduction to Integral equation
31-L30	Explain the types of integral equations**.**
32-L31	Explain the fredholm integral equations.
33-L32	Explain the volterra integral equations.
34- P3	**Department Seminar**
35-L34	Volterra integral equations continued.
36-L35	Introduction to Green's function. - **Allotting portion for Internal Test-II**
	Internal Test II begins on 03-09-2018
37-L36	Properties of Green's function.
38- IT-II	**Internal Test-II**
38-L37	Green's function derivation.
39-L38	Problems on Green's function.
40-L39	Problems on Green's function continued. - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L40	Introduction to Bessel equation.
42-L41	Problems on Bessel equation.
43-L42	UNIT –IV- Introduction to Influence function.
44- P4	**College level meeting/ function**
45-L43	Problems on Influence function.
46-L44	Explain about separable kernel and examples, and theorems related to separable kernels.
47-L45	Illustrative examples related to separable kernel. - **Test Paper distribution and result analysis**
48-L46	Illustrative examples related to separable kernel.
49-L47	UNIT - V – Introduction to Hilbert – Schmidt theory
50-L48	Some theorems related to Hilbert – Schmidt theory **Allotting portion for Internal Test-III**
	Internal Test III begins on 08-10-2018
51-L49	Derivation related to Hilbert Schmidt theory.
52-L50	Derivation of nonhomogeneousFredholm equation of the second kind.
53-L51	Continuation of derivation of nonhomogeneousFredholm equation of the second kind. **Model Test Announcement.**
53-IT-III	**Internal Test-III**
54-L52	Problems related to Hilbert Schmidt theory. Over all view of the course by PPT
55-L53	Problems related to Hilbert Schmidt theory. - **Test Paper distribution and result analysis**
56- MT	**Model Test 22-10-2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**

	Last Working day on 31-10-2018

Course Outcomes

Learning Outcomes	**COs** of the course “CALCULUS OF VARIATIONS AND INTEGRAL EQUATIONS”
CO1	Fully understand the properties of geometrical problems.
CO2	Be familiar with variation problems.
CO3	Be familiar isoperimetric problems.
CO4	Be through with different types of integral equations.
CO5	Students will be able to recognize difference between Volterra and Freedom integral equation, First kind, Second kind, Homogenous and etc.
CO5	Be exposed to the successive approximation method.
Experimental Learning	
EL1	To do working models to explain functional.
EL2	To collect, categoriesproblems using large multipliers and constraints.
Integrated Activity	
IA1	Prepare chart forEuler equations.
IA3	Prepare chart for integral equations.
IA2	How calculus of variation used in day-today life.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

Forslow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Advanced Algebra II
Course Code	**PMAM43**
Class	II year (2018-2019)
Semester	Even
Staff Name	Dr. Mrs. Grace Prema
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- This paper aims to an in depth knowledge about the algebraic structure of fields, which is vital in providing algebraic tools to find roots of equations.This course starts with basic concepts of fields, existence and properties of extension fields of polynomials. Also it aims to provide the use of Gaolis theory in discussing the existence of roots of polynomials

Syllabus

Advanced Algebra II

Unit I: Extension fields.:Extension fields.

Sections: 5.1 Problems: 5.1(1-5, 8)

Unit II: Roots of Polynomials: Roots of polynomials – More about roots.

Sections: 5.3, 5.5 Problems: 5.5(1-3)

Unit III: Elements of Galois Theory: Elements of Galois theory.

Sections: 5.6

Unit IV: Finite fields :Finite fields – Wedderburn's theorem(First proof only)

Sections: 7.1, 7.2(Theorem 7.2.1-First proof only)

Unit V: Some special theorems:A theorem of Frobenius – Integral quaternions and the four square theorem.

Sections: 7.3, 7.4.

Text Book:

Topics in Algebra(Second edition) Wiley Eastern Limited – I.N. Herstein

Book for Reference:

1) A course in Abstract algebra (3rd edition)-Vijay.K.Khanna,S.K.Bhambri – Vikas Publishing House –Newdelhi.
2) Modern Algebra –Surjeetsingha and Qazizameerudin- Vikas Publishing House –Newdelhi.
3) Fields and Rings –Kaplemsky ,Irving (Second edition)-University of Chicago-Chicago -(1972).

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 02.12.2019
1-L1	Introduction
2-L2	Extension fields
3- L3	Extension fields
4-L4	Extension fields
5-L5	Extension fields
6-L6	Extension fields
7-L7	Extension fields
8- P1	**Inauguration of Mathematics Association**
9- L8	Exercise Problems
10- L9	Exercise Problems
11-L10	Roots of polynomials
12-L11	Roots of polynomials
13-L12	Roots of polynomials
14-L13	Roots of polynomials
15-L14	Roots of polynomials
16-L15	Roots of polynomials
17- L16	More about roots
18- L17	More about roots
19- L18	More about roots

20- L19	More about roots
21- L20	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins 23.01.2020
22- L21	Elements of Galois theory
23- IT-1	**Internal Test-I**
24- L22	Elements of Galois theory
25- L23	Elements of Galois theory
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Elements of Galois theory
28- L26	Elements of Galois theory
29- L27	Elements of Galois theory
30- P2	**College level meeting/Cell function**
31-L28	Elements of Galois theory
32-L29	Elements of Galois theory
33-L30	Elements of Galois theory
34- L31	Elements of Galois theory
35- L32	Elements of Galois theory
36- L33	Elements of Galois theory
37- L34	Finite fields
38-L35	Finite fields
39- L36	Finite fields
40- L37	Finite fields
41- L38	Finite fields
42-P3	**Department Seminar**
43- L39	Finite fields
44- L40	Finite fields
45- L41	Finite fields
46- L42	Finite fields
47- L43	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins 25-02-2019
48- L44	Wedderburn's theorem
49-IT-II	**Internal Test-II**
50-L45	Wedderburn's theorem
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	A theorem of Frobenius
53- L48	A theorem of Frobenius
54- L49	A theorem of Frobenius
55- L50	A theorem of Frobenius
56- L51	A theorem of Frobenius
57- L52	A theorem of Frobenius
58- L53	A theorem of Frobenius
59-P4	**College level meeting/ function**
60- L54	Integral quaternions and the four square theorem.
61- L55	Integral quaternions and the four square theorem.
62- L56	Integral quaternions and the four square theorem.
63- L57	Integral quaternions and the four square theorem.

64- L58	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins 22-03-2019
65- L59	Revision
66- L60	Revision
67-IT-III	**Internal Test-III**
68- L61	Class Test
69- L62	Class Test
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test 08-04-2019**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 27.04.2020

Course Outcomes

Learning Outcomes	**COs** of the course "Advanced Algebra II"
CO1	Gain knowledge in fields in the theory of numbers, the theory of equations and Galois Theory.
CO2	Understand the application of Galois Theory in theory of equations and Geometry.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Partial Differential Equation
Course Code	**PMAE23**
Class	I year (2018-2019)
Semester	Even
Staff Name	V.Selvan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Partial Differential Equations in one of the important branches of Mathematics which provides techniques to solve operator equations in Fluid Mechanics. Partial Differential Equations arise when the dependent variable depends on more than one independent variables. The purpose of this course is to find the relation between the variables from the relation between the variables and its partial derivatives. Students are expected to have good knowledge of basic Calculus and the Theory of Ordinary Differential Equations.

Syllabus

Text Book: Elements Of Partial Differential Equations, IAN N. SNEDDON, McGraw Hill, New Delhi,1983.

Unit I: Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$ - 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)

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03.12.2018
1-L1	Introduction
2-L2	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
3- L3	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
4-L4	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
5-L5	Pfaffian Differential Forms and Equations
6-L6	Pfaffian Differential Forms and Equations
7-L7	Pfaffian Differential Forms and Equations
8- P1	**Inauguration of Mathematics Association**
9- L8	Solution of Pfaffian Differential Equations in three variables
10- L9	Solution of Pfaffian Differential Equations in three variables
11-L10	Solution of Pfaffian Differential Equations in three variables
12-L11	Solution of Pfaffian Differential Equations in three variables
13-L12	Partial Differential equations
14-L13	Partial Differential equations
15-L14	Partial Differential equations
16-L15	Origins of first order Partial Differential equations
17- L16	Origins of first order Partial Differential equations
18- L17	Origins of first order Partial Differential equations
19- L18	Linear equations of the first order
20- L19	Linear equations of the first order
21- L20	**Allotting portion for Internal Test-I**
	Internal Test I begins (18.01.2019)
22- L21	Linear equations of the first order
23- IT-1	**Internal Test-I**

24- L22	Linear equations of the first order
25- L23	Integral surfaces passing through a given curve
26- L24	**____ - Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Integral surfaces passing through a given curve
28- L26	Integral surfaces passing through a given curve
29- L27	Integral surfaces passing through a given curve
30- P2	**College level meeting/Cell function**
31-L28	Cauchy's Method of Characteristics
32-L29	Cauchy's Method of Characteristics
33-L30	Cauchy's Method of Characteristics
34- L31	Cauchy's Method of Characteristics
35- L32	Compatible systems of First order Equations
36- L33	Compatible systems of First order Equations
37- L34	Compatible systems of First order Equations
38-L35	Compatible systems of First order Equations
39- L36	Charpit's Method
40- L37	Charpit's Method
41- L38	Charpit's Method
42-P3	**Department Seminar**
43- L39	Second order equations in Physics
44- L40	Second order equations in Physics
45- L41	Second order equations in Physics
46- L42	Linear Partial Differential equations with Constant Coefficients
47- L43	**Allotting portion for Internal Test-II**
	Internal Test II begins (25.02.2019)
48- L44	Linear Partial Differential equations with Constant Coefficients
49-IT-II	**Internal Test-II**
50-L45	Characteristics of Equations in three variables
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Characteristics of Equations in three variables
53- L48	Characteristics of Equations in three variables
54- L49	Characteristics of Equations in three variables
55- L50	Problems
56- L51	Problems
57- L52	Problems
58- L53	Separation of variables
59-P4	**College level meeting/ function**
60- L54	Separation of variables
61- L55	Separation of variables
62- L56	Separation of variables
63- L57	Separation of variables
64- L58	**Allotting portion for Internal Test-III**
	Internal Test III begins (22.03.2019)
65- L59	Problems
66- L60	Problems
67-IT-III	**Internal Test-III**

68- L61	Revision
69- L62	Revision
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test(08.04.2019)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course "Partial Differential Equation"
CO1	Acquisition of knowledge about Pfaffian Differential Forms and Equations and their Solution in three variables.
CO2	Students will know about Origins of first order Partial Differential equations.
CO3	Knowledge gained about Cauchy's Method of Characteristics and Charpit's Method.
CO4	Learners will know about Second order equations in Physics, Linear Partial Differential equations with Constant Coefficients and Characteristics of Equations in three variables.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Algebra – II
Course Code	**PMAM21**
Class	I year (2018-2019)
Semester	Even
Staff Name	G.S.Grace Prema
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To understand the concepts on ring theory
- To classify the properties in Euclidean rings and Principal ideal rings
- To explain about the polynomial rings over some specific spaces
- To study the various types of radicals and direct sum of rings

Syllabus

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**

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03.12.2018
1-L1	Unit I – Introduction to ring and ring homomorphism
2-L2	Kernel of a ring homomorphism and results on it.
3- L3	Examples to explain ring homomorphism and its kernel; definition of Isomorphism
4-L4	Ideal of a ring and examples
5-L5	Illustration of Quotient ring and its homomorphic image
6-L6	Necessary condition for a commutative ring to become a field
7-L7	Maximal ideals; the structure of maximal ideals of the ring of integers
8- P1	**Inauguration of Mathematics Association**
9- L8	Necessary and sufficient condition for an ideal of a commutative ring to be a maximal ideal
10- L9	Imbedding a ring into another ring
11-L10	Every integral domain can be imbedded in a field – Proof discussion
12-L11	Every integral domain can be imbedded in a field – Proof discussion (contd.)
13-L12	The field of Quotients of an integral domain
14-L13	Unit II – Integral domain, zero divisors, and Euclidean ring
15-L14	Characterization of ideals in a Euclidean ring
16-L15	Definition of Principal ideal ring and implications between Euclidean ring and Principal ideal ring
17- L16	Definition of 'divide' and some results on it
18- L17	greatest common divisor of two elements and its general form in a Euclidean ring
19- L18	'Units' in a commutative ring and some properties
20- L19	Associate elements in a commutative ring and d-value of non-unit elements
21- L20	Prime element in a Euclidean ring and expression of every elements in prime factors - **Allotting portion for Internal Test-I**
	Internal Test I begins (18.01.2019)
22- L21	Relatively prime and its property in a Euclidean ring
23- IT-1	**Internal Test-I**

24- L22	Unique Factorization theorem
25- L23	Necessary and sufficient condition for the generating element of an ideal in a Euclidean ring R to be a prime element of R
26- L24	The particular Euclidean ring J[i] - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Basic lemmas to prove Fermat theorem
28- L26	Proof of Fermat theorem
29- L27	Unit III – The Polynomial ring F[x] over a field. Defining the equality, sum, product of polynomials
30- P2	**College level meeting/Cell function**
31-L28	Degree of a polynomial and finding the degree of the product of two or more polynomials
32-L29	The Division Algorithm in a polynomial ring
33-L30	Irreducible polynomials over the field and the structure of maximal ideals in polynomial ring
34- L31	Primitive polynomials and its property
35- L32	Content of a polynomial and Gauss' Lemma
36- L33	Integer monic polynomials and The Eisenstein Criterion
37- L34	The polynomial rings over a commutative ring
38- L35	Definition of Unique factorization domain (UFD)
39- L36	The existence of greatest common divisor of any two elements in a UFD
40- L37	Content, primitive concepts in the polynomial rings over a commutative ring
41- L38	Unique factorization of primitive polynomial in R[x] if R is UFD
42-P3	**Department Seminar**
43- L39	The implication of unique factorization domain between R and R[x]
44- L40	Unit IV – Jacobson radical of a ring (rad R); semi-simple ring
45- L41	Finding rad R for some rings, namely ring of integers, C[0,1] and ring of formal power series
46- L42	Structure of an ideal that is subset of the Jacobson radical
47- L43	Corollaries to discuss about idempotent element, nil ideal, invertible elements using 'rad R'. - **Allotting portion for Internal Test-II**
	Internal Test II begins (25.02.2019)
48- L44	Proving that the quotient ring R/rad R is semi-simple.
49-IT-II	**Internal Test-II**
50-L45	Expressing the Jacobson radical of a quotient ring R/I as a function of the radical of R.
51- L46	Necessary and sufficient condition for that a principal ideal domain to be semi-simple; and its consequences. - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Prime radical of a ring 'Rad R' and its results
53- L48	Nil radical of an ideal in a ring
54- L49	Relation between the Jacobson and nil radical in the ring of polynomials R[x]
55- L50	Idempotent of a quotient ring can be raised or lifted into the ring – Definition and its results
56- L51	Unit V – Quasi-regular elements in a ring; existence of quasi-regular elements and quasi-inverse
57- L52	The 'circle operation' of Perlis; and some results under circle operation
58- L53	*J*-radical J(R) of a ring and *J*-semisimple ring – Definitions, examples

59-P4	**College level meeting/ function**
60- L54	Claiming that the *J*-radical is an ideal of the ring
61- L55	Proving that the quotient ring R/J(R) is *J*-semisimple.
62- L56	Complete direct sum of the collection of rings
63- L57	Discrete direct sum of the collection of rings and i^{th} component projections
64- L58	Subdirect sum. Structure of a ring that is isomorphic to a subdirect sum of a collection of rings –**Allotting portion for Internal Test-III**
	Internal Test III begins (22.03.2019)
65- L59	Some examples and theorems under subdirect sum
66- L60	A necessary condition of a ring which is prerequisite to study Artinian rings
67-IT-III	**Internal Test-III**
68- L61	Chinese Remainder Theorem and definition of 'sub-directly irreducible'
69- L62	Birkhoff theorem – Proof discussion
70- L63	Heart of a ring and McCoy theorem - **Test Paper distribution and result analysis**
	Model Test begins (08.04.2019)
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra II"
CO1	After studying this course, Students can have a better ability to explain about ring and ring homomorphism.
CO2	Illustrate about ideals and some special kind of ideals
CO3	Classify the properties in Euclidean rings and Principal ideal rings
CO4	Ability to solve problems in Euclidean rings and its particular rings
CO5	Can explain about certain radicals of a ring, such as, Jacobson radical, nil radical, prime radical and *J*-radical.
CO6	Classify the difference between complete direct sums, discrete direct sums, subdirect sums
Experimental Learning	
EL1	Differentiate the types of rings graphically
EL2	Classifications on certain radicals of a ring
EL3	The defining manner of Euclidean ring is demonstrating as an generalization of ring of integers
EL4	Motivated to solve CSIR-NET questions based on ring theory

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis II
Course Code	**PMAM22**
Class	I year (2018-2019)
Semester	Even
Staff Name	S Shymlala Malini
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Understanding the concept of Riemann Integral .
- Gain Knowledge about Uniform convergence
- Understanding the concept of Power series, Fourier series
- Gain Knowledge of Gamma functions

Syllabus

2.2 Paper 7: ANALYSISII

Text Book: Principles of Mathematical Analysis, Third Edition, Walter Rudin – McGraw Hill International BookCompany.

UnitI: Definition and Properties of Integral – Integration andDifferentiation.
Chapter 6: Section: 6.1 – 6.22.

Exercise Problems: Chapter 6: 1, 2, 4, 5, 10, 11.

UnitII: Integration of vector valued functions – Rectifiable arcs, Sequence and Series of functions: Discussion of main problem – Uniform Convergence – Uniform Convergence andContinuity.
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.

UnitIV: The Stone Weierstrass Theorem - PowerSeries.
Chapter 7: Section: 7.26– 7.33 and **Chapter 8:** Section: 8.1 – 8.5.

Exercise Problems: Chapter 8: 1 – 5.

UnitV: 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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03.12.2018
1-L1	Unit I Definition of Riemann Integral and examples
2-L2	Theorems in Riemann Integral
3- L3	Theorems in Riemann Integral
4-L4	Properties of the Integral
5-L5	The fundamental theorem of calculas
6-L6	Theorem of Integration by parts
7-L7	Theorems in Riemann Integral
8- P1	**Inauguration of Mathematics Association**
9- L8	Theorems in Riemann Integral
10- L9	Introduction of vector valued functions
11-L10	Theorems in vector valued functions
12-L11	Theorems in vector valued functions
13-L12	Definition of rectifiable curve and theorems
14-L13	Theorems in rectifiable curve
15-L14	Unit II Definition of convergent sequence and convergent series with examples
16-L15	Theorems in convergent sequence and convergent series
17- L16	Theorems in convergent sequence and convergent series
18- L17	Problems in convergent sequence and convergent series
19- L18	Problems in convergent sequence and convergent series
20- L19	Definition of Uniform convergence and examples
21- L20	Riemann Integral to convergent sequenc - **Allotting portion for Internal Test-I**
	Internal Test I begins (18.01.2019)
22- L21	Cauchy criterion theorem
23- IT-1	**Internal Test-I**

24- L22	Wierestrass theorem
25- L23	Theorems in Uniform convergent sequence
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Theorems in Uniform convergent sequence
28- L26	Problems in Uniform convergent sequence
29- L27	Unit III Definition of Integrations and examples
30- P2	**College level meeting/Cell function**
31-L28	Theorems in Integrations
32-L29	Theorems in Integrations
33-L30	Theorems in Integrations
34- L31	Theorems in Integrations
35- L32	Problems in Integrations
36- L33	Problems in Integrations
37- L34	Theorems in Equicontinuous
38- L35	Theorems in Equicontinuous
39- L36	Theorems in Equicontinuous
40- L37	Theorems in Equicontinuous
41- L38	Problems in Equicontinuous
42-P3	**Department Seminar**
43- L39	Equicontinuous
44- L40	Unit IV The stone wierestrass theorem
45- L41	The stone wierestrass theorem
46- L42	Definition of algebra, Uniform closure and examples
47- L43	Cauchy criterian theorem toEquicontinous - **Allotting portion for Internal Test-II**
	Internal Test II begins (25.02.2019)
48- L44	Theorems in algebra and Uniform closure
49-IT-II	**Internal Test-II**
50-L45	Theorems in algebra and Uniform closure
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Theorems in algebra and Uniform closure
53- L48	Theorems in algebra and Uniform closure
54- L49	Stone generalisation theorem
55- L50	Introduction in Power series and theorems
56- L51	Theorems in Power series
57- L52	Taylors theorem
58- L53	Unit V Introduction to The algebraic completeness of the complex field
59-P4	**College level meeting/ function**
60- L54	Theorems in the algebraic completeness of the complex field
61- L55	Definition of Fourier series and theorems
62- L56	Definition of orthonormal and orthogonal and theorems
63- L57	Parsevels Theorem
64- L58	Stone wierestrass theorem to Parsevels theorem- **Allotting portion for Internal Test-III**
	Internal Test III begins (22.03.2019)
65- L59	Introduction to gamma function and theorem

66- L60	Some results in gamma functions
67-IT-III	**Internal Test-III**
68- L61	Some results in gamma functions
69- L62	Stirling formula
70- L63	**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test(08.04.2019)**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course “<Analysis II>”
CO1	Describes fundamental properties of Riemann Integral
CO2	Solved Problems in Riemann Integral
CO3	Describes the Properties in Power series
CO4	Solving the problems using Power series

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Classical Mechanics
Course Code	**PMAM23**
Class	I year (2018-2019)
Semester	Even
Staff Name	Alwin Asir
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To study mechanical systems under generalized coordinate systems, virtual work, energy and momentum
- To study mechanics developed by Newton, Langrange, Hamilton and Jacobi

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begins on 03.12.2018
1-L1	Unit I – Introduction: Mechanics of a single particle
2-L2	Conservation theorem for linear momentum of a single particle
3- L3	Conservation theorem for angular momentum of a single particle
4-L4	Some remarks on conservation theorems
5-L5	Energy conservation theorem
6-L6	Problem discussion on mechanics of a single particle
7-L7	Mechanics of a system of particles
8- P1	**Inauguration of Mathematics Association**
9- L8	Conservation theorem for linear momentum of a system of particles
10- L9	Conservation theorem for angular momentum of a system of particles
11-L10	Theorems on Kinetic energy
12-L11	Problem discussion on Kinetic energy
13-L12	Energy conservation theorem
14-L13	Exercise problems using conservation theorem
15-L14	Unit II – Constraints: Different types of constraints
16-L15	Examples for holonomic constraints and non-holonomic constraints
17- L16	Virtual work and D'Alembert's Principle
18- L17	Lagrange's equation from D'Alembert's Principle – Theorem
19- L18	Lagrange's equation for non-holonomic constraints
20- L19	Velocity dependent potentials
21- L20	Rayleigh Dissipation function –**Allotting portion for Internal Test-I**

	Internal Test I begins on 18.01.2019
22- L21	Lagrangian for charged particle and some problems
23- IT-1	**Internal Test-I**
24- L22	Applications of the Lagrangian equation
25- L23	Lagrangian for a single particle (i) in cartesian coordinates (ii) in polar coordinates
26- L24	Lagrangian for Atwood machine - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Time dependent potential
28- L26	Problem - bead sliding on rotating wire and some exercise problems
29- L27	Unit III – Variation principles and lagrange's equation - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Hamilton's principle
32-L29	Stationary values
33-L30	Path of a system – congugration
34- L31	
35- L32	Techniques of calculus of variation - theorem
36- L33	Lagrange's equation from Hamilton's principle
37- L34	Shortest distance between two point in a space
38- L35	Minimum surface of revolution
39- L36	Brachistochrone problem
40- L37	Extension of Hanilton's Principle
41- L38	Extension of Hanilton's Principle non-holonomic system
42-P3	**Department Seminar**
43- L39	Unit IV –Two body central force problem
44- L40	Reduction to one body problem
45- L41	The equations of motion and first integral theorem
46- L42	The Kepler's Second law of planetary motion
47- L43	Derivatives - **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
48- L44	Illustrations about derivative and motion
49-IT-II	**Internal Test-II**
50-L45	The equivalent one dimensional problems
51- L46	Classification of orbits - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Examples of the method occurs for a linear restoring force
53- L48	Inverse square law for circular orbits
54- L49	The virial theorem.
55- L50	Problem discussion based on the virial's theorem
56- L51	Unit V – The differential equation for the orbit
57- L52	Problems on differential equation for the orbit
58- L53	Integrable power-law potentials

59-P4	**College level meeting/ function**
60- L54	The Kepler problem
61- L55	Inverse square law of force
62- L56	Nature of the orbit depends on e and E
63- L57	The motion in time in the Kepler problem
64- L58	Deriving the approximate version of the Kepler's third law – **Allotting portion for Internal Test-III**
	Internal Test III begins on 22.03.2019
65- L59	Existence of conserved vector **A** for the Kepler problem
66- L60	The Laplace-Runge-Lenz vector
67-IT-III	**Internal Test-III**
68- L61	Problem discussion
69- L62	Scattering in a central force field
70- L63	Relation of orbit parameters and scattering angle - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 08.04.2019
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Classical Mechanics"
CO1	Able to understand D' Alembert's Principle and simple applications of the Lagrangian Formulation.
CO2	Able to analyze the Derivation of Lagrange's Equations from Hamilton's Principle and Extension of Hamilton's Principle to Non-holonomic Systems
CO3	Able to study the concept of the Equations of Motion and the Equivalent One-Dimensional Problems.
CO4	Able to understand the Kepler Problem and Inverse-Square Law of Force.
CO5	Able to distinguish the concept of the Hamilton Equations of Motion and the Principle of Least Action.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Differential Geometry
Course Code	**PMAM24**
Class	I year (2018-2019)
Semester	Even
Staff Name	W. Rajammal Ranjitha Mary
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To be able to understand the fundamental theorem for plane curves
- To understand fundamental abstract topological structures
- To improve problem solving skills
- To introduce essential ideas and methods of differential geometry

Syllabus

DIFFERENTIAL GEOMETRY

Unit I: The theory of space curves – Definitions , Arc length – Tangent – Normal and Binormal – Curvature and Torsion.

Unit II: Contact between curves and surfaces – Tangent Surface – Involutes and evolutes – Helices

Unit III: Definition of a surface – Curves on a surface – Helicoids – Metric – Direction

Coefficients.

Unit IV: Families of curves – Geodesics , Canonical geodesic equation, Normal Property of geodesics (Christoffel symbols not included).

Unit V: Geodesic curvature , The Second Fundamental form – Principal Curvature – Lines of Curvature (Dupin's indicatrix not included).

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 3-12-2018
1-L1	UNIT I - THE THEORY OF SPACE CURVES- Introduction of Space curves
2-L2	Definitions of space curves
3- L3	Arc Length
4-L4	Problems on Arc Length
5-L5	Tangent – unit tangent vector
6-L6	Osculating plane
7-L7	Problems on Osculating plane
8- P1	**Inauguration of Mathematics Association**
9- L8	Normal - Unit normal vector –Normal plane
10- L9	Theorems on Osculating plane and Normal plane
11-L10	Curvatures of a curve
12-L11	Behaviour of a curve in the neighbourhood of a point on it.
13-L12	Torsion of a curve
14-L13	Curvature &torsion of a curve given as the intersection of two surfaces.
15-L14	UNITII**:** CONTACT BETWEEN CURVES AND SURFACES - Introduction
16-L15	Osculating Circle and Osculating Sphere
17- L16	Locus of centre of Spherical curvature
18- L17	Tangent surface of a curves
19- L18	Involutes of a curve
20- L19	Evolutes of a curve
21- L20	Helices - **Allotting portion for Internal Test-I**
	Internal Test I begins on 18.01.2019
22- L21	To find the equation of the Involutes
23- IT-1	**Internal Test-I**
24- L22	To find the equation of the Evolutes
25- L23	Definition of circular helices and cylindrical helices
26- L24	Characteristic property of Helices-**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Circular helix and Cylindrical helix
28- L26	Relation between the curvatures of a general helix and its projection on a plane orthogonal to its axis
29- L27	**UNIT III:** DEFINITION OF A SURFACE - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Definition of a curve on a surface
32-L29	Definition Of Parametric Equations – Proper Transformation
33-L30	Equivalent relations of two surfaces
34- L31	Curves on surface
35- L32	Parametric curves and orthogonal to each other
36- L33	Definitions of a Helicoids
37- L34	Right helicoids and General helicoids

38-L35	Definition of Metric
39- L36	Problems on Metric
40- L37	Angle between Parametric curves
41- L38	Elements of area
42-P3	**Department Seminar**
43- L39	Direction coefficients
44- L40	UNIT IV- FAMILIES OF CURVES – Introduction
45- L41	General significance of the sense of the tangent vector
46- L42	Orthogonal trajectories
47- L43	Discuss about the Orthogonal trajectories **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
48- L44	Problems on Orthogonal trajectories
49-IT-II	**Internal Test-II**
50-L45	Double family of curves
51- L46	Geodesics - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Derivation of equations to Geodesics
53- L48	Problems on Geodesics
54- L49	Problems on Geodesics
55- L50	Canonical geodesics equations
56- L51	Normal property of Geodesics
57- L52	Equivalent statement of the normal property
58- L53	UNIT V- GEODESIC CURVATURE-Introduction
59-P4	**College level meeting/ function**
60- L54	Examples on Geodesic curvature
61- L55	Problems onGeodesic curvature
62- L56	Second Fundamental form
63- L57	Mensniersthrorem
64- L58	Principal Curvature- **Allotting portion for Internal Test-III**
	Internal Test IIIbegins on 22.03.2019
65- L59	Lines of Curvature Rodrigue's formula
66- L60	Euler's theorem
67-IT-III	**Internal Test-III**
68- L61	Liouville's formula
69- L62	Geometrical interpretation of the second fundamental form
70- L63	Classification of point on a surface - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test 08-04-2019**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Differential Geometry"
CO1	Appreciation and understanding of what makes properties and arguments geometric
CO2	Understanding between intrinsic and extrinsic properties
CO3	Define the equivalence of two curves
CO4	Define surfaces and their properties
CO5	Express tangent spaces of surfaces
Integrated Activity	
IA1	Rigorous treatment to the concepts and methods of differential geometry via the classical theory of curves and surfaces in Euclidean space
IA2	Able to understand the classical theory of curves and surfaces

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Graph Theory
Course Code	**PMAM25**
Class	I year (2018-2019)
Semester	Even
Staff Name	G Jeya Kumar
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Graph Theory is an integral part of Discrete Mathematics and has applications indiversified areas such as Electrical Engineering, Computer science, Linguistics
- Study the basic concepts of Graph theory such as Trees, connectivity, tour, trail, cycles, etc.
- To understand the ideas of matchings and colourings in graphs and some of its applications
- Illustration on ramsey number of a graph and ramsey's graph with recursion formula to calculate ramsey number
- To explain the concepts of independent number and cliques of a graph and its results

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03.12.2018
1-L1	Unit I – Acyclic graphs, Tree and edges of tree in terms of vertices
2-L2	Cut edges; Equivalent condition for cut edges
3- L3	Spanning tree and some results on spanning tree
4-L4	Edge cut, bond and cotree
5-L5	Cut vertices; Necessary and sufficient condition for a vertex of a tree to be a cut vertex
6-L6	Edge contraction and recursion formula to find the number of spanning trees
7-L7	Cayley's formula and its proof that is given by Prufer
8- P1	**Inauguration of Mathematics Association**
9- L8	Connectivity – its basic definitions and examples
10- L9	Theorem giving relation between edge and vertex connectivities
11-L10	Block of a connected graph
12-L11	Menger's theorem
13-L12	Application on construction of reliable communication networks
14-L13	Harary's theorem on *m*-connected graph
15-L14	Unit II – Tour, trail, walk path and cycle definitions with examples
16-L15	Necessary and sufficient condition for a graph to be an eulerian
17- L16	Necessary and sufficient condition for a connected graph to have an Euler trail
18- L17	Hamilton path and cylces of a graph and examples
19- L18	Necessary condition for a graph to be hamiltonian
20- L19	Dirac's theorem
21- L20	Closure of a graph and some basic results -**Allotting portion for Internal TestI**

	Internal Test I beginson 18.01.2019
22- L21	Closure property on Hamiltonian graph
23- IT-1	**Internal Test-I**
24- L22	Chvatal's theorem on degree sequences
25- L23	Chvatal's theorem on degree majorized graphs
26- L24	Condition for a simple graph to be a Hamiltonian graph - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Application: The Chinese postman problem
28- L26	Fleury's Algorithm
29- L27	Unit III – Matchings and Berge theorem
30- P2	**College level meeting/Cell function**
31-L28	Matchings and coverings in bipartite graphs
32-L29	Hall's theorem on bipartite graph
33-L30	Perfect matching and some results
34- L31	Marriage theorem
35- L32	Theorem on maximum matching and minimum covering
36- L33	Tutte's theorem – necessary and sufficient condition for a graph to have a perfect matching
37- L34	Peterson theorem on 3-regular graph
38- L35	Edge chromatic number: basic definitions and examples
39- L36	Results on edge colouring and chromatic number for bipartite graph
40- L37	Vizing's theorem
41- L38	Vizing's theorem (continuation)
42-P3	**Department Seminar**
43- L39	Unit IV –Independent sets of a graph
44- L40	Necessary and sufficient condition for a subset of the vertex set to be an independent set of the graph
45- L41	Edge independence number and Gallai's theorem
46- L42	Koning's theorem on bipartite graph
47- L43	Clique of a graph and some basic results - **Allotting portion for Internal Test-II**
	Internal Test II beginson 25.02.2019
48- L44	Ramsey numbers and recursion formula on ramsey number
49-IT-II	**Internal Test-II**
50-L45	Illustration of ramsey number using graphs
51- L46	(k, l)-Ramsey graph and results- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Erdos theorem on r(k, k)
53- L48	Complete *m*-partite graph on *n*-vertices
54- L49	Turan's theorem
55- L50	Turan's theorem (continuation)
56- L51	Unit V – Vertex colouring: k-vertex colouring of a graph, chromatic number of a

	graph, illustration
57- L52	Theorem on k-critical graphs
58- L53	Results on critical graphs
59-P4	**College level meeting/ function**
60- L54	Driac's theorem on k-critical graph
61- L55	Brook's theorem
62- L56	Subvision of a graph
63- L57	Remarks on Hajos' conjecture
64- L58	Chromatic polynomials of a graph - **Allotting portion for Internal Test-III**
	Internal Test III beginson 22.03.2019
65- L59	Algorithm to find the chromatic polynomial of a graph
66- L60	Chromatic polynomial of any graph as a linear combination of chromatic polynomials of complete graphs
67-IT-III	**Internal Test-III**
68- L61	Girth and chromatic number
69- L62	Mycielski's theorem
70- L63	Problem discussion on chromatic number and polynomials - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 08.04.2019
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Graph Theory"
CO1	Able to understand the definitions namely, cut vertex, bridge and blocks on a graph
CO2	Study the properties of trees and connectivity
CO3	Identify Eulerian graphs and apply results to identify Hamiltonian graphs
CO4	Understand the concepts Planarity including Euler identity
CO5	Discuss and understand the importance of the concepts Matchings and Colourings
CO6	Able to illustrate the ramsey number of a graph and ramsey's graph with recursion formula which is to calculate ramsey number
CO7	Explain the concepts of independent number and cliques of a graph and its results

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Functional Analysis
Course Code	**PMAM41**
Class	II year (2018-2019)
Semester	Even
Staff Name	Mrs.S.Vijila Velvet Daisy
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objective

- The aim of the course is to enable the student to understand the basic ideas of functional analysis. The course deals with Normed linear spaces, Banach spaces, Hilbert spaces, bounded linear functional, operators and projections. Functional analysis is an important area of pure mathematics which has wide range of applications in quantum mechanics, theoretical physics, control theory, approximation theory, and optimization techniques. The learner will be able to appreciate these advanced mathematical structures and its application various fields.

Syllabus

Functional Analysis

UNIT 1: BanachSpaces: Banach Spaces- The definition and some examples- Continuous linear transformations- The Hahn Banach Theorem
Chapter 9 Sections 46, 47, 48 .

Problems: Section 46 (1-4), 47 (1-3) 48 (1).

UNIT 2: Imbedding: The Natural Imbedding of N in N**- The open mapping theorem
Chapter 9 Sections 49, 50
Problems: Section 49 (1-3), 50 (2,3)

UNIT 3: Hilbert Spaces: Conjugate of an operator -Hilbert Spaces-The Definition and some simple properties- Orthogonal compliments
Chapter 9 Section 51, Chapter 10 Sections 52, 53
Problems: Section 51 (1-3) 52 (4,6), 53 (1-4).

UNIT 4: The Conjugate space and adjoint: Orthonormal sets-The conjugate space H*- The Adjoint of an operator- Self adjoint operators
Chapter 10 Sections 54, 55, 56, 57
Problems: Section 54 (1,5) 55 (1-3), 56 (1-4), 57 (1,2)

UNIT 5: Spectral Theory: Normal and Unitary operators- projections, Finite dimensional spectral theory- Determinants and the spectrum of an operator- The spectral theorem
Chapter 10 Sections 58, 59, Chapter 11 Sections 61, 62
Problems: Section 58, 59, 61, 62 (1-5) .

Text Book: Introduction to Topology and Modern Analysis- G.F. SIMMONS-McGraw- Hill International Editions

Books for Reference:
1. Functional Analysis - Second edition (2011), Tata MC Graw Hill Education Private Ltd. (New Delhi) – Walter Rudin.
2. Functional Analysis – K.ChandrasekaraRao, Narosa Publishing House (2009) New Delhi.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 02.12.2019
1-L1	Introduction
2-L2	Banach Spaces
3- L3	Banach Spaces
4-L4	Banach Spaces
5-L5	The definition and some examples
6-L6	The definition and some examples
7-L7	Continuous linear transformations
8-L8	Continuous linear transformations
9-L9	Continuous linear transformations
10-P1	**Inauguration of Mathematics Association**
11-L10	The Hahn Banach Theorem
12-L11	The Hahn Banach Theorem

13-L12	The Hahn Banach Theorem
14-L13	**Imbedding**
15-L14	The Natural Imbedding of N in N**
16-L15	The Natural Imbedding of N in N**
17-L16	The Natural Imbedding of N in N**
18-L17	The Natural Imbedding of N in N**
19-L18	The open mapping theorem
20-L19	The open mapping theorem
21-L20	The open mapping theorem
22-L21	The open mapping theorem
23-L22	**Allotting portion for Internal Test-I**
	Internal Test I begins23.01.2020
24-L23	Hilbert Spaces
25-L24	Hilbert Spaces
26-IT-1	**Internal Test-I**
27-L25	Conjugate of an operator
28-L26	Conjugate of an operator
29-L27	Conjugate of an operator
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Hilbert Spaces
32- L30	Hilbert Spaces
33- L31	Hilbert Spaces
34-P2	**College level meeting/Cell function**
35- L32	The Definition and some simple properties
36- L33	The Definition and some simple properties
37- L34	The Definition and some simple properties
38- L35	Orthogonal compliments
39- L36	Orthogonal compliments
40- L37	Orthogonal compliments
41- L38	The Conjugate space and adjoint
42- L39	Orthonormal sets
43- L40	Orthonormal sets
44- L41	Orthonormal sets
45- L42	The conjugate space H*
46- L43	The conjugate space H*
47- L44	The conjugate space H*
48- L45	The Adjoint of an operator
49- L46	The Adjoint of an operator
50- L47	The Adjoint of an operator
51- P3	**Department Seminar**
52- L48	Self adjoint operators
53- L49	Self adjoint operators
54- L50	Self adjoint operators
55- L51	Self adjoint operators
56-L52	**Allotting portion for Internal Test-II**
	Internal Test II begins 25-02-2019
57-L53	Spectral Theory

58-L54	Spectral Theory
59-IT-II	**Internal Test-II**
60- L55	Spectral Theory
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Normal and Unitary operators
63- L58	Normal and Unitary operators
64- L59	Normal and Unitary operators
65- L60	Normal and Unitary operators
66- L61	projections
67- L62	projections
68- L63	Finite dimensional spectral theory
69- L64	Finite dimensional spectral theory
70- L65	Finite dimensional spectral theory
71- L66	Determinants and the spectrum of an operator
72- L67	Determinants and the spectrum of an operator
73- L68	Determinants and the spectrum of an operator
74-P4	**College level meeting/ function**
75- L69	Determinants and the spectrum of an operator-
76- L70	The spectral theorem
77- L71	The spectral theorem
78- L72	The spectral theorem
79- L73	**Allotting portion for Internal Test-III**
	Internal Test III begins 22-03-2019
80- L74	Problems
81- L75	Problems
82-IT-III	**Internal Test-III**
83- L76	Problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 08-04-2019**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on27.04.2020

Course Outcomes

Learning Outcomes	**COs** of the course "Functional Analysis"
CO1	To gain knowledge about Banach Spaces, Hilbert Spaces and Banach Algebra.
CO2	To use algebraic structure in Analysis.
CO3	Graduates will have a strong foundations and in depth understanding of the current topics related with functional

	Analysis, Spectral Theory, Approximation Theory.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Measure and Integration
Course Code	**PMAM31**
Class	II year (2018-2019)
Semester	Odd
Staff Name	W. Rajammal Ranjitha Mary
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Gain the knowledge of measure spaces and measure interruption
- Understanding the concept of lebesgue measure, lebesgue integration and signed measure
- To provide the understanding of general measure spaces

Syllabus

UnitI: **LebesgueMeasure:**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 – CantelliLemma.

Chapter 2 : Sec 2.1 – 2.5

Problems : Chapter 2 : 1 – 12 and 17

UnitII: **Lebesgue Measurable functions&Sequential pointwise Limits and related Theorems**: Lebesgue Measurable functions – Sums, Products and Compositions. Sequential pointwise Limits and Simple Approximation – Littlewood's Three Principles, Egoroff's Theorem and Lusin'sTheorem

Chapter 3 : Sec 3.1 - 3.3and

Problems :Chapter 3 : 1 – 3

Unit III: LebesgueIntegration : Lebesgue Integration – The Riemann Integral – The Lebesgue Integralofa bounded Measurable function over a set of finite measure – The Lebesgue integral of non-negative functions.

Chapter 4 : Sec 4.1 to 4.3

Unit IV: Lebesgue Integral &Differentiablility:The general Lebesgue Integral – Countable Additivity and Continuity of Integration. Differentiation and Integration – Continuity of monotone functions – Differentiability of monotone function: Lebesgue's theorem – Functions of bounded variations: Jordan's theorem.

Chapter 4 : Sec 4.4 & 4.5

Chapter 6 : Sec 6.1 - 6.3

UnitV: Absolutely continuous functions &Signed Measures: Absolutely continuous functions – Integrating Derivatives : Differentiating Indefinite Integrals. Measure and Integration – Measures and Measurable sets – Signed Measures : The Hahn and Jordan Decompositions – The Caratheodory measure induced by an outer measure – The construction of outermeasure

Chapter 6 : Sec 6.4 & 6.5

Chapter 17 : Sec : 17.1 - 17.4

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 17-6-2019
1-L1	Unit I Introduction to Measure theory
2-L2	Definition of outer measure with examples
3- L3	Theorems in outer measure
4-L4	Theorems in outer measure
5-L5	Definition of Lebesgue measure and examples
6-L6	Theorems in Lebesgue measure
7-L7	Theorems in Lebesgue measure
8-L8	Theorems in Lebesgue measure
9-L9	Theorems in Lebesgue measure
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Outer an Inner approximation theorem
12-L11	Theorems in Lebesgue measure
13-L12	Countable additivity theorem

14-L13	Borel Canteli lemma
15-L14	Problems in Lebesgue measure
16-L15	Problems in Lebesgue measure
17-L16	Problems in Lebesgue measure
18-L17	Unit II Introduction to Lebesgue functions
19-L18	Theorems in Lebesgue functions
20-L19	Theorems in Lebesgue functions
21-L20	Introduction to sequential pointwise limits
22-L21	Theorems in Lebesgue functions
23-L22	Outer measure to Lebesgue function - **Allotting portion for Internal Test-I**
	Internal Test I begins on 24.07.2019
24-L23	Simple approximation theorem
25-L24	Little wood’s three principle theorem
26-IT-1	**Internal Test-I**
27-L25	Little wood’s three principle theorem
28-L26	Egoroff’s theorem
29-L27	Egoroff’s theorem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Lusin Theorem
32- L30	Problems in Lebesgue functions
33- L31	Problems in Lebesgue functions
34-P2	**College level meeting/Cell function**
35- L32	Problems in Lebesgue functions
36- L33	Unit III Introduction on Lebesgue Integration
37- L34	Theorems in Lebesgue Integration
38- L35	Theorems in Lebesgue Integration
39- L36	Theorems in Lebesgue Integration
40- L37	Theorems in Riemann Integral
41- L38	Theorems in Riemann Integral
42- L39	Theorems in Riemann Integral
43- L40	Theorems in Riemann Integral
44- L41	Introduction to Lebesgue integral of measurable non negative function
45- L42	Theorems in Lebesgue integral of measurable non negative function
46- L43	Theorems in Lebesgue integral of measurable non negative function
47- L44	Theorems in Lebesgue integral of measurable non negative function
48- L45	Problems in Lebesgue functions
49- L46	Problems in Lebesgue functions
50- L47	Problems in Lebesgue functions
51- P3	**Department Seminar**
52- L48	Problems in Riemann Integral
53- L49	Unit IV Introduction of countable additivity and continuity of Integration
54- L50	Theorems in countable additivity and continuity of Integration
55- L51	Theorems in countable additivity and continuity of Integration
56-L52	Simple approximation theorem to Riemann integral- **Allotting portion for Internal Test-II**
	Internal Test II begins28.08.2019
57-L53	Theorems in countable additivity and continuity of Integration

58-L54	Theorems in differentiation and Integration
59-IT-II	**Internal Test-II**
60- L55	Theorems in differentiation and Integration
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorems in differentiation and Integration
63- L58	Theorems in differentiation and Integration
64- L59	Theorems in differentiability of monotone function
65- L60	Theorems in differentiability of monotone function
66- L61	Lebesgue theorem
67- L62	Jordan's theorem
68- L63	Jordan's theorem
69- L64	Problems in the differentiability of monotone function
70- L65	Unit V Introduction to absolutely continuous functions
71- L66	Theorems inabsolutely continuous functions
72- L67	Theorems inabsolutely continuous functions
73- L68	Theorems inabsolutely continuous functions
74-P4	**College level meeting/ function**
75- L69	Theorems in differentiation and indefinite integration
76- L70	Theorems in differentiation and indefinite integration
77- L71	Introduction to measure and measurable sets
78- L72	Theorems in measure and measurable sets
79- L73	Theorems in differentiation and integration to measurable set- **Allotting portion for Internal Test-III**
	Internal Test III begins 27.10.2019
80- L74	Theorems in signed measure
81- L75	Theorems in signed measure
82-IT-III	**Internal Test-III**
83- L76	Hahn- Decomposition theorem
84- L77	**Test Paper distribution and result analysis**
85- L78	Construction of outer measure
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-10-2019

Course Outcomes

Learning Outcomes	**COs** of the course "<Measure and Integration>"
CO1	Knowledge gained about lebesgue theory
CO2	Solved problems using lebegue theory
CO3	Grt knowledge about their properties and constructions

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	TopologyI
Course Code	**PMAM32**
Class	II year (2018-2019)
Semester	Odd
Staff Name	J. Subhashini
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To distinguish space by means of Simple Topologicalinvariants.
- Gain the knowledge of constructing spaces by giving and to prove that incertain case, that the result is homeomorphic to standard spaces.
- Basic knowledge in Set Theory and Analysis at Undergraduatelevel.

Syllabus

UnitI: **Topological spaces :**Topological spaces – Basis fortopology – The order topology – The subspace topology- Closed sets and limitpoints.
Chapter 2: Sections: 12-14 and 16,17.
Problems: Section 13: 1, 4 and Section 16: 4, 6. Section 17: 1,11-13

UnitII: **Product topology :**The product topology on X × Y – Continuous functions – Product topology
Chapter 2: Section 15, 18,19.
Problems: Section 18: 2,3 and Section 19: 1-3.

UnitIII: **Metric Topology :**MetricTopology
Chapter 2: Section 20, 21
Problems: Section 20:1-3 and section 21:1, 2.

UnitIV: **Some spaces in topological spaces:**Connected spaces – Compactspaces.

Chapter 3: Sections: 23,26
Problems: Section 23: 2-4 and Section 26: 3, 6.

UnitV: **Compactness :**Limit point compactness – Localcompactness.
Chapter 3: Section 28,29.
Problems: Section 29:2,3.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2018
1-L1	Unit I Introduction on topology
2-L2	Definition of Basis and examples
3- L3	Theorems in Basis
4-L4	Theorems in Basis
5-L5	Theorems in Basis
6-L6	Definition of Ordered Topology and Subspace Topology with examples
7-L7	Lemmas in subspace Topology
8-L8	Theorems in subspace Topology
9-L9	Definition and examples on closed set and closure of a set
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Theorems in closed set
12-L11	Theorems in closed set
13-L12	Definition of Interior of a set and limit point of a set with examples
14-L13	Theorems in limit point of a set
15-L14	Definition of Hausdorff space and examples
16-L15	Theorems in Hausdorff space
17-L16	Theorems in Hausdorff space
18-L17	Unit II Definition of Product Topology and examples
19-L18	Theorems in Product Topology
20-L19	Theorems in Product Topology
21-L20	Definition of Continuous functions with examples
22-L21	Theorems in Continuous functions
23-L22	Topology on Continuous functions - **Allotting portion for Internal Test-I**
	Internal Test I begins on 30.07.2018
24-L23	Definition of Homeomorphism and examples
25-L24	Theorems in Homeomorphism
26-IT-1	**Internal Test-I**
27-L25	The Pasting Lemma and examples
28-L26	Theorems in Product Topology
29-L27	Theorems in Product Topology
30-L28	Theorems in Product Topology - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Theorems in Product Topology
32- L30	Problems in Product Topology
33- L31	Problems in Product Topology
34-P2	**College level meeting/Cell function**
35- L32	Problems in Product Topology
36- L33	Unit III Definition of Metric spaces and examples
37- L34	Theorems in Metric Topology
38- L35	Theorems in Metric Topology
39- L36	Theorems in Metric Topology

40- L37	Theorems in Metric Topology
41- L38	Theorems in Metric Topology
42- L39	Theorems in Metric Topology
43- L40	Theorems in Metric Topology
44- L41	Problems in Metric Topology
45- L42	Problems in Metric Topology
46- L43	Problems in Metric Topology
47- L44	Problems in Metric Topology
48- L45	Problems in Metric Topology
49- L46	Problems in Metric Topology
50- L47	Problems in Metric Topology
51- P3	**Department Seminar**
52- L48	Problems in Metric Topology
53- L49	Unit IV Seperation axioms and the definition of the Connected space
54- L50	Examples for connected spaces
55- L51	Theorems in connected spaces
56-L52	Homeomorphism to connected spaces - **Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
57-L53	Theorems in connected spaces
58-L54	Theorems in connected spaces
59-IT-II	**Internal Test-II**
60- L55	Theorems in connected spaces
61- L56	Theorems in connected spaces - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorems in connected spaces
63- L58	Problems in connected spaces
64- L59	Problems in connected spaces
65- L60	Definition of Compact spaces and examples
66- L61	Theorems in connected spaces
67- L62	Theorems in connected spaces
68- L63	Problems in connected spaces
69- L64	Problems in connected spaces
70- L65	Unit V – Limit Point Compactness Theorem
71- L66	Limit Point Compactness Theorem
72- L67	Limit Point Compactness Theorem
73- L68	Problems in Limit Point Compactness Theorem
74-P4	**College level meeting/ function**
75- L69	Problems in Limit Point Compactness Theorem
76- L70	Problems in Limit Point Compactness Theorem
77- L71	Problems in Limit Point Compactness Theorem
78- L72	Problems in Limit Point Compactness Theorem
79- L73	Connected spaces to Limit point compactness- **Allotting portion for Internal Test-III**
	Internal Test III begins on 08.10.2018
80- L74	Some Exercise problems for revision
81- L75	Some Exercise problems for revision
82-IT-III	**Internal Test-III**
83- L76	Some Exercise problems for revision

84- L77	Some Exercise problems for revision - **Test Paper distribution and result analysis**
85- L78	Some Exercise problems for revision
	Entering Internal Test-III Marks into University portal
	Model test begins on 22.10.2018
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Topology I"
CO1	Define the notion of limit of a function at agiven point and if there exists estimate the limit
CO2	Define the notion of metric space,construct the topology by using the metric and using this topology identify the continuity of the functions which are defined between metric.
CO3	Use the open ball on metric spaces, construct the metric topology and define open-closed sets of the space.
CO4	Define the notion of Topology
CO5	Define the subspace topology

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Operations Research
Course Code	PMAM34
Class	II year (2018-2019)
Semester	Odd
Staff Name	J. Vijaya Xavier Parthiban
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

This course deals with network models, dynamic and integer programming, inventory and queuing theory, nonlinear programming, and provide the mathematical basis behind these techniques. The aim of this course is to help the students to understand and apply some of the widely used techniques of Operations Research.

Syllabus

Operations Research (75 Hours)

Unit I: Transportation Models And Its Variants: Definition Of The Transportation Model – Nontraditional 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.

Chapter 11 – Sections 11.1, 11.2, 11.3, Chapter 16 – Sections 16.1, 16.2 and Exercise problems.

Unit V: Queuing Theory: Basic Elements Of Queuing Model – Role Of Poisson And Exponential Distributions – Pure Birth And Death Models – Specialised Poisson Queues

Chapter 17 – Sections 17.2, 17.3, 17.4, 17.6(upto 17.6.3) and Exercise problems.

Text Book:

1. Operations Research(Sixth Edition) , Hamdy A. Taha, Prentice Hall Of India Private Limited, New Delhi.

Books for Reference:

1. Introduction to Operations Research – Fredrick, Shiller, GenraldJ.Literman – MC Graw Hill (2017)

2. Operations Research – KantiSwarup, P.K. Gupta, Man Mohan – Sultan Chand and sons. (2016)

3. Operations Research (Fifth edition) J.N Sharma, McMillian Publications (2013)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2018
1-L1	Introduction
2-L2	Transportation Models And Its Variants: Definition Of The Transportation Model
3- L3	Transportation Models And Its Variants: Definition Of The Transportation Model
4-L4	Transportation Models And Its Variants: Definition Of The Transportation Model
5-L5	Transportation Models And Its Variants: Definition Of The Transportation Model
6-L6	Nontraditional Transportation Model
7-L7	Nontraditional Transportation Model
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Nontraditional Transportation Model
10- L9	Transportation Algorithm

11-L10	Transportation Algorithm
12-L11	Transportation Algorithm
13-L12	The Assignment Model
14-L13	The Assignment Model
15-L14	The Assignment Model
16-L15	Network Analysis: Network Definitions
17- L16	Network Analysis: Network Definitions
18- L17	Minimal Spanning Tree Algorithm
19- L18	Minimal Spanning Tree Algorithm
20- L19	Minimal Spanning Tree Algorithm
21- L20	Problem discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(30.07.2018)
22- L21	Shortest Route Problem
23- IT-1	**Internal Test-I**
24- L22	Shortest Route Problem
25- L23	Maximum Flow Model
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Maximum Flow Model
28- L26	CPM
29- L27	CPM
30- P2	**College level meeting/Cell function**
31-L28	PERT
32-L29	PERT
33-L30	Integer Linear Programming: Introduction
34- L31	Integer Linear Programming: Introduction
35- L32	Integer Linear Programming: Introduction
36- L33	Applications
37- L34	Applications
38-L35	Integer Programming Solutions
39- L36	Integer Programming Solutions
40- L37	Integer Programming Solutions
41- L38	Algorithms
42-P3	**Department Seminar**
43- L39	Algorithms
44- L40	Inventory Theory: Basic Elements Of An Inventory Model
45- L41	Inventory Theory: Basic Elements Of An Inventory Model
46- L42	Inventory Theory: Basic Elements Of An Inventory Model
47- L43	Problem discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(03.09.2018)
48- L44	Deterministic Models: Single Item Stock Model With And Without Price Breaks
49-IT-II	**Internal Test-II**
50-L45	Deterministic Models: Single Item Stock Model With And Without Price Breaks
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Multiple Items Stock Model With Storage Limitations

53- L48	Multiple Items Stock Model With Storage Limitations
54- L49	Probabilistic Models
55- L50	Probabilistic Models
56- L51	Continuous Review Model
57- L52	Continuous Review Model
58- L53	Continuous Review Model
59-P4	**College level meeting/ function**
60- L54	Queuing Theory: Basic Elements Of Queuing Model
61- L55	Queuing Theory: Basic Elements Of Queuing Model
62- L56	Role Of Poisson And Exponential Distributions
63- L57	Role Of Poisson And Exponential Distributions
64- L58	Problem discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(08.10.2018)
65- L59	Pure Birth And Death Models
66- L60	Pure Birth And Death Models
67-IT-III	**Internal Test-III**
68- L61	Specialised Poisson Queues
69- L62	Specialised Poisson Queues
70- L63	**Test Paper distribution and result analysis**
	Revision
71-MT	**Entering Internal Test-III Marks into University portal**
72-MT	**Model Test (22.10.2018)**
73-MT	**Model Test**
74-L64	**Model Test**
75-L65	**Model test paper distribution and previous year university question paper discussion**
	Feedback of the Course, analysis and report preparation

Course Outcomes

Learning Outcomes	**COs** of the course “Operations Research”
CO1	To modify real life into Standard Mathematical Models.
CO2	To learn different optimization techniques.
CO3	To know classification of different structured problems.
CO4	Basic computing knowledge and techniques at undergraduate level.
CO5	Identification of actual problems and its equivalent mathematical models.
CO6	Application to different optimization techniques in real life situations.
CO7	Knowledge gained in utilization of Optimum Resources.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Research Methodology
Course Code	**PMAM35**
Class	II year (2018-2019)
Semester	Odd
Staff Name	Alwin Asir
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To understand the Basic aspects in research
- To learn Mathematical and Statistical technique for research
- To acquire basic knowledge about various instruments and techniques in Mathematical research.

Syllabus

MSU / 2017-18 / PG –Colleges / M.Sc.(Mathematics) / Semester -III

Research Methodology

Unit I : Research Project

Research Project – Difference between a dissertation and a thesis– Basic requirements of a research degree –Writing a proposal –Ethical considerations

Unit II : Components of a Research Project

Different components of a research project–Literature review – Methodology – Results / data – Conclusions – Bibliography - Appendices.

Unit III : Some Special Distributions

The Gamma and Chi – Square distribution – The normal distribution

Unit IV : Sampling Theory

Transformation of variables – t & F distributions.

Unit V : Random variables

The MGF technique – Distributions of $\bar{X}$ and $\frac{ns^2}{\sigma^2}$ - Expectations of functions of random variables-The Central Limit Theorem.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2018
1-L1	UNIT I : RESEARCH PROJECT – Introduction - Research Project
2-L2	Explaining about dissertation
3- L3	Explaining about a thesis
4-L4	Difference between a dissertation and a thesis
5-L5	Basic requirements of a research degree
6-L6	Discuss about originality
7-L7	Other requirements of the thesis
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Writing a proposal
10- L9	Format of a proposal
11-L10	Ethical considerations
12-L11	UNIT II : COMPONENTS OF A RESEARCH PROJECT –General introduction
13-L12	Different components of a research project
14-L13	Preliminary section, Body of the work, Supporting sections
15-L14	Title page - **Allotting portion for Internal Test-I**
	Internal Test I begins 30.07.2018
16-L15	Abstract of the project
17-IT-1	**Internal Test-I**
18-L16	Acknowledgement Section
19-L17	List of contents - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Literature review
21- L19	Methodology – Results / data
22- P2	**College level meeting/Cell function**
23-L20	Conclusions – Bibliography - Appendices.
24-L21	UNIT III : SOME SPECIAL DISTRIBUTIONS –Introduction to distributions
25-L22	Gamma distribution – Mean ,Variance and MGF
26-L23	Problems on gamma distribution
27-L24	Derivation of Normal distribution
28-L25	Normal distribution – Mean ,Variance and MGF

29-L26	Properties of Normal distribution
30-L27	Problems on Normal distribution
31-L28	Derivation of Chi-square distribution
32-L29	Chi-square distribution – Mean ,Variance and MGF
33-L30	Problems on Chi-square distribution
34- P3	**Department Seminar**
35-L31	UNIT IV : SAMPLING THEORY – Introduction to transformation of variables
36-L32	Distribution of functions of random variables - **Allotting portion for Internal Test-II**
	Internal Test II begins 03.09.2018
37- L33	Random samples
38- IT-II	**Internal Test-II**
39-L34	Problems on Random samples
40-L35	Transformation of variables of the discrete type - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Problems on Transformation of variables of the discrete type
42- L37	Transformation of variables of the continuous type
43- L38	Problems on Transformation of variables of the continuous type
44- P4	**College level meeting/ function**
45-L39	Derivation of t-distribution and problems
46-L40	Derivation of F-distribution and problems
47-L41	UNIT V : RANDOM VARIABLES – Introduction
48-L42	The MGF Technique
49-L43	Problems on MGF technique
50-L44	Distributions of $\bar{X}$ and $\frac{ns^2}{\sigma^2}$- **Allotting portion for Internal Test-III**
	Internal Test III begins 08.10.2018
51 L45	Problems on $\bar{X}$ and $\frac{ns^2}{\sigma^2}$
52- L46	The Central Limit Theorem
53-IT-III	**Internal Test-III**
54-L47	Expectations of functions of random variables
55-L48	Problems onExpectations of functions of random variables - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test 22.10.2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Research Methodology”
CO1	Training and participating in active research activities for their academic and professional levels.
CO2	Creation of novel ideas and simple technique useful to society(R/D)
CO3	Acquire background knowledge in research publication and thesis writing.
CO4	Develop skills in quantitative data analysis and presentation
CO5	Develop advanced critical thinking skills
Integrated Activity	
IA1	Preparing a thesis model
IA2	Able to understand graphical representations and statistical information in media and daily life

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Advanced Algebra – I
Course Code	**PMAM33**
Class	II year (2018-2019)
Semester	Odd
Staff Name	C. Henrietta Johnsy
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To introduce some of the most fundamental algebraic structures like inner product space, dual space, etc.
- To know the relation between the expression of matrix and linear transformations.
- Explain some of the canonical forms: Triangular form, Nilpotent form and Jordan decomposition form.
- Introduce the notation of general matrix and its properties.
- To understand the concepts of normal, unitary, Hermitian, skew-Hermitian matrices.

Syllabus

MSU / 2017-18 / PG –Colleges / M.Sc.(Mathematics) / Semester -III / Ppr.no.14 / Core-13

Advanced Algebra I (75 Hours)

Unit I: **Vector spaces:** Dual spaces – Inner product spaces.

Sections: 4.3 and 4.4.

Unit II: **Linear transformations:** The Algebra of linear transformations –

Characteristic roots – Matrices. **Sections:** 6.1 – 6.3.

Unit III: Canonical Forms: Triangular form – Nilpotent form – Jordan form.

Sections: 6.4 - 6.6.

Unit IV: Matrices: Trace and transpose – Determinants.

Sections: 6.8-6.9

Unit V: Transformations: Hermitian, unitary and normal transformations.

Sections: 6.10(Up to Lemma 6.10.11)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begins on 18.06.2018
1-L1	Unit I – Introductory Class – Basic concepts of vector spaces, linearly independence and bases
2-L2	Linear transformation between vector spaces, Dual Spaces
3- L3	Basic Properties in dual space Hom(V, W)
4-L4	The Dual space
5-L5	Theorem of isomorphism between a vector space and its dual space
6-L6	Annihilator of a subspace in a vector space and its properties
7-L7	First isomorphism theorem on vector spaces
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Definition of inner product space and its examples
10- L9	Norm value of a vector and proof of Schwarz inequality
11-L10	Orthogonal property, orthogonal complement of a set, orthonormal set and necessary properties on it
12-L11	Gram-Schmidt Orthogonalization process and explanation using an example
13-L12	Unique representation of a vector space as a direct sum of subspace and its orthogonal complement
14-L13	Unit II – The algebra of linear transformations and definition of algebra and the notation $A_F(V)$=Hom(V, V).
15-L14	Cayley's theorem on algebra
16-L15	Polynomials over a field, minimal polynomials, roots of a polynomial in algebra and some theorems
17- L16	Singular elements and regular elements in A(V)
18- L17	Properties on singular and regular elements and invertible linear transformations
19- L18	Range and Rank of a linear transformation r(T) and its properties
20- L19	Problem discussion on rank
21- L20	Characteristic roots of a linear transformation on a finite-dimensional vector space over a field – **Allotting portion for Internal Test-I**
	Internal Test I begins (30.07.2018)
22- L21	Characteristic vectors of a linear transformation and some necessary conditions on it
23- IT-1	**Internal Test-I**

24- L22	Matrix representation of a linear transformation with respect to basis elements
25- L23	Illustrate the matrix representations of differentiable operator with respect to different bases
26- L24	Defining the generalized matrix and its properties –**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Algebra isomorphism between A(V) and F_n by T – > m(T)
28- L26	Similarities between matrices of a linear transformation T with respect to different bases
29- L27	Unit III –Canonical form: 1 Triangular form, similarities between linear transformations, invariant space under T
30- P2	**College level meeting/Cell function**
31-L28	Sufficient condition for a matrix of T to be triangular (in terms of characteristic roots of matrix)
32-L29	Structure of the polynomial of T which is in triangular form
33-L30	Canonical form: 2 Nilpotent transformations,
34- L31	Matrix of linear transformation T with respect to the decomposition of V
35- L32	Index of nilpotence; the general structure of the matrix of a nilpotent transformation
36- L33	Existence of invariant subspace of a vector space V that decompose V.
37- L34	Necessary and sufficient condition for two nilpotent transformation to be similar.
38- L35	Canonical form: 3 Jordan Form (Jordan decomposition of a finite-dimensional vector space)
39- L36	Structure of a minimal polynomial of T_i on V_i where V is the direct sum of V_i's where i> 1.
40- L37	Jordan block belonging to characteristic roots, Jordan canonical form and its matrix
41- L38	Necessary and sufficient condition for that a linear transformation can be brought to the same Jordan form
42-P3	**Department Seminar**
43- L39	Unit IV – Trace of a matrix, properties of linearity and commutativitywhen trace is considered as functions on F_n
44- L40	Trace of a linear transformations, trace of T is as the sum of its characteristic roots
45- L41	Jacobson Lemma and a sufficient condition for a linear transformation T to be nilpotent (using trace of T)
46- L42	Transpose of a matrix and its elementary properties
47- L43	Symmetrix matrix and Skew-symmetric matrix – **Allotting portion for Internal Test-II**
	Internal Test II begins (03.09.2018)
48- L44	Adjoint of a matrix on F_n – Hermitian and skew-Hermitian matrices
49-IT-II	**Internal Test-II**
50-L45	Determinants of a matrix – defining procedure
51- L46	Some elementary properties on determinants–**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Vanishing the determinant value of a matrix that have two rows/columns are equal

53- L48	Determinant of invertible matrix and product of matrices
54- L49	Cramer's rule; necessary and sufficient condition for a matrix to be a invertible matrix
55- L50	Secular equation of a matrix and its existence for every matrix – Cayley-Hamilton Theorem
56- L51	Unit V –Unitary linear transformation - definition using inner products
57- L52	Necessary and sufficient condition for a transformation to be unitary (using orthonormal basis)
58- L53	The motivation theorem for adjoint; Hermitianadjoint of a linear transformation
59-P4	**College level meeting/ function**
60- L54	Elementary properties of Hermitianadjoint of T
61- L55	Hermitian(self-adjoint) and skew-Hermitian linear transformation
62- L56	Characteristic roots of any Hermitian transformation is real – proof argument
63- L57	Normal linear transformation
64- L58	Characteristic roots of Normal transformations – **Allotting portion for Internal Test-III**
	Internal Test III begins (08.10.2018)
65- L59	Relation between a normal transformation and its Hermitianadjoint. Relation between the characteristic roots of a normal transformation and its Hermitianadjoint
66- L60	Relation between distinct characteristic vectors belonging to distinct characteristic roots of a normal transformation – Arguments
67-IT-III	**Internal Test-III**
68- L61	Diagonalization process in the matrix of normal/unitary/Hermitian transformations
69- L62	Necessary and sufficient conditions for a normal transformation N to be a Hermitian (or Unitary) transformation
70- L63	Commutative property in normal matrix and its adjoints– **Test Paper distribution and result analysis**
	Model Test begins (22.10.2018)
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Advanced Algebra – I"
CO1	Able to asses properties implied by the definitions of groups and rings
CO2	Student can understand the notion of Dual Spaces.
CO3	Student can understand the algebra of Linear

	transformations.
CO4	Can easily explain about the fundamental algebraic structures like inner product space, linear transformations, dual space,etc.
CO5	Describe the relation between the expression of matrix and linear transformations.
CO6	Can able to discuss about characteristic roots and its characteristic vectors
CO7	Gained knowledge about the standard canonical forms, called as Triangular form, Nilpotent form and Jordan decomposition form.
CO8	Studied several properties of matrices and its determinants
CO9	Understand the concepts of normal, unitary, Hermitian, skew-Hermitian matrices as well as linear transformations
Experimental Learning	
EL1	Students are motivated to solve CSIR-NET questions depending upon matrix theory, especially trace, transpose.
EL2	Theory on Determinant matrices are induced to study with the help of examples
EL3	Gram-Schmidt Orthogonalization process can understand by integral and differential operators
Integrated Activity	
IA1	Demonstrate about the page rank using in Google – Application of Characteristic roots
IA2	Use technological tools such as computer algebra systems or graphing calculators for visualization and calculation of linear algebra concepts

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Measure and Integration
Course Code	**PMAM31**
Class	II year (2018-2019)
Semester	Odd
Staff Name	W. Rajammal Ranjitha Mary
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Gain the knowledge of measure spaces and measure interruption
- Understanding the concept of lebesgue measure, lebesgue integration and signed measure
- To provide the understanding of general measure spaces

Syllabus

UnitI: **LebesgueMeasure:**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 – CantelliLemma.

Chapter 2 : Sec 2.1 – 2.5

Problems : Chapter 2 : 1 – 12 and 17

UnitII: **Lebesgue Measurable functions&Sequential pointwise Limits and related Theorems**: Lebesgue Measurable functions – Sums, Products and Compositions. Sequential pointwise Limits and Simple Approximation – Littlewood's Three Principles, Egoroff's Theorem and Lusin'sTheorem

Chapter 3 : Sec 3.1 - 3.3and

Problems :Chapter 3 : 1 – 3

Unit III: LebesgueIntegration : Lebesgue Integration – The Riemann Integral – The Lebesgue Integralofa bounded Measurable function over a set of finite measure – The Lebesgue integral of non-negative functions.

Chapter 4 : Sec 4.1 to 4.3

Unit IV: Lebesgue Integral &Differentiablility:The general Lebesgue Integral – Countable Additivity and Continuity of Integration. Differentiation and Integration – Continuity of monotone functions – Differentiability of monotone function: Lebesgue's theorem – Functions of bounded variations: Jordan's theorem.

Chapter 4 : Sec 4.4 & 4.5

Chapter 6 : Sec 6.1 - 6.3

UnitV: Absolutely continuous functions &Signed Measures: Absolutely continuous functions – Integrating Derivatives : Differentiating Indefinite Integrals. Measure and Integration – Measures and Measurable sets – Signed Measures : The Hahn and Jordan Decompositions – The Caratheodory measure induced by an outer measure – The construction of outermeasure

Chapter 6 : Sec 6.4 & 6.5

Chapter 17 : Sec : 17.1 - 17.4

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 17-6-2019
1-L1	Unit I Introduction to Measure theory
2-L2	Definition of outer measure with examples
3- L3	Theorems in outer measure
4-L4	Theorems in outer measure
5-L5	Definition of Lebesgue measure and examples
6-L6	Theorems in Lebesgue measure
7-L7	Theorems in Lebesgue measure
8-L8	Theorems in Lebesgue measure
9-L9	Theorems in Lebesgue measure
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Outer an Inner approximation theorem
12-L11	Theorems in Lebesgue measure
13-L12	Countable additivity theorem

14-L13	Borel Canteli lemma
15-L14	Problems in Lebesgue measure
16-L15	Problems in Lebesgue measure
17-L16	Problems in Lebesgue measure
18-L17	Unit II Introduction to Lebesgue functions
19-L18	Theorems in Lebesgue functions
20-L19	Theorems in Lebesgue functions
21-L20	Introduction to sequential pointwise limits
22-L21	Theorems in Lebesgue functions
23-L22	Outer measure to Lebesgue function - **Allotting portion for Internal Test-I**
	Internal Test I begins on 24.07.2019
24-L23	Simple approximation theorem
25-L24	Little wood's three principle theorem
26-IT-1	**Internal Test-I**
27-L25	Little wood's three principle theorem
28-L26	Egoroff's theorem
29-L27	Egoroff's theorem
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Lusin Theorem
32- L30	Problems in Lebesgue functions
33- L31	Problems in Lebesgue functions
34-P2	**College level meeting/Cell function**
35- L32	Problems in Lebesgue functions
36- L33	Unit III Introduction on Lebesgue Integration
37- L34	Theorems in Lebesgue Integration
38- L35	Theorems in Lebesgue Integration
39- L36	Theorems in Lebesgue Integration
40- L37	Theorems in Riemann Integral
41- L38	Theorems in Riemann Integral
42- L39	Theorems in Riemann Integral
43- L40	Theorems in Riemann Integral
44- L41	Introduction to Lebesgue integral of measurable non negative function
45- L42	Theorems in Lebesgue integral of measurable non negative function
46- L43	Theorems in Lebesgue integral of measurable non negative function
47- L44	Theorems in Lebesgue integral of measurable non negative function
48- L45	Problems in Lebesgue functions
49- L46	Problems in Lebesgue functions
50- L47	Problems in Lebesgue functions
51- P3	**Department Seminar**
52- L48	Problems in Riemann Integral
53- L49	Unit IV Introduction of countable additivity and continuity of Integration
54- L50	Theorems in countable additivity and continuity of Integration
55- L51	Theorems in countable additivity and continuity of Integration
56-L52	Simple approximation theorem to Riemann integral- **Allotting portion for Internal Test-II**
	Internal Test II begins28.08.2019
57-L53	Theorems in countable additivity and continuity of Integration

58-L54	Theorems in differentiation and Integration
59-IT-II	**Internal Test-II**
60- L55	Theorems in differentiation and Integration
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorems in differentiation and Integration
63- L58	Theorems in differentiation and Integration
64- L59	Theorems in differentiability of monotone function
65- L60	Theorems in differentiability of monotone function
66- L61	Lebesgue theorem
67- L62	Jordan's theorem
68- L63	Jordan's theorem
69- L64	Problems in the differentiability of monotone function
70- L65	Unit V Introduction to absolutely continuous functions
71- L66	Theorems inabsolutely continuous functions
72- L67	Theorems inabsolutely continuous functions
73- L68	Theorems inabsolutely continuous functions
74-P4	**College level meeting/ function**
75- L69	Theorems in differentiation and indefinite integration
76- L70	Theorems in differentiation and indefinite integration
77- L71	Introduction to measure and measurable sets
78- L72	Theorems in measure and measurable sets
79- L73	Theorems in differentiation and integration to measurable set- **Allotting portion for Internal Test-III**
	Internal Test III begins 27.10.2019
80- L74	Theorems in signed measure
81- L75	Theorems in signed measure
82-IT-III	**Internal Test-III**
83- L76	Hahn- Decomposition theorem
84- L77	**Test Paper distribution and result analysis**
85- L78	Construction of outer measure
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-10-2019

Course Outcomes

Learning Outcomes	**COs** of the course "<Measure and Integration>"
CO1	Knowledge gained about lebesgue theory
CO2	Solved problems using lebegue theory
CO3	Grt knowledge about their properties and constructions

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	TopologyI
Course Code	**PMAM32**
Class	II year (2018-2019)
Semester	Odd
Staff Name	J. Subhashini
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To distinguish space by means of Simple Topologicalinvariants.
- Gain the knowledge of constructing spaces by giving and to prove that incertain case, that the result is homeomorphic to standard spaces.
- Basic knowledge in Set Theory and Analysis at Undergraduatelevel.

Syllabus

UnitI: **Topological spaces :**Topological spaces – Basis fortopology – The order topology – The subspace topology- Closed sets and limitpoints.
Chapter 2: Sections: 12-14 and 16,17.
Problems: Section 13: 1, 4 and Section 16: 4, 6. Section 17: 1,11-13

UnitII: **Product topology :**The product topology on X × Y – Continuous functions – Product topology
Chapter 2: Section 15, 18,19.
Problems: Section 18: 2,3 and Section 19: 1-3.

UnitIII: **Metric Topology :**MetricTopology
Chapter 2: Section 20, 21
Problems: Section 20:1-3 and section 21:1, 2.

UnitIV: **Some spaces in topological spaces:**Connected spaces – Compactspaces.

Chapter 3: Sections: 23,26
Problems: Section 23: 2-4 and Section 26: 3, 6.

UnitV: **Compactness :**Limit point compactness – Localcompactness.
Chapter 3: Section 28,29.
Problems: Section 29:2,3.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2018
1-L1	Unit I Introduction on topology
2-L2	Definition of Basis and examples
3- L3	Theorems in Basis
4-L4	Theorems in Basis
5-L5	Theorems in Basis
6-L6	Definition of Ordered Topology and Subspace Topology with examples
7-L7	Lemmas in subspace Topology
8-L8	Theorems in subspace Topology
9-L9	Definition and examples on closed set and closure of a set
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Theorems in closed set
12-L11	Theorems in closed set
13-L12	Definition of Interior of a set and limit point of a set with examples
14-L13	Theorems in limit point of a set
15-L14	Definition of Hausdorff space and examples
16-L15	Theorems in Hausdorff space
17-L16	Theorems in Hausdorff space
18-L17	Unit II Definition of Product Topology and examples
19-L18	Theorems in Product Topology
20-L19	Theorems in Product Topology
21-L20	Definition of Continuous functions with examples
22-L21	Theorems in Continuous functions
23-L22	Topology on Continuous functions - **Allotting portion for Internal Test-I**
	Internal Test I begins on 30.07.2018
24-L23	Definition of Homeomorphism and examples
25-L24	Theorems in Homeomorphism
26-IT-1	**Internal Test-I**
27-L25	The Pasting Lemma and examples
28-L26	Theorems in Product Topology
29-L27	Theorems in Product Topology
30-L28	Theorems in Product Topology - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Theorems in Product Topology
32- L30	Problems in Product Topology
33- L31	Problems in Product Topology
34-P2	**College level meeting/Cell function**
35- L32	Problems in Product Topology
36- L33	Unit III Definition of Metric spaces and examples
37- L34	Theorems in Metric Topology
38- L35	Theorems in Metric Topology
39- L36	Theorems in Metric Topology

40- L37	Theorems in Metric Topology
41- L38	Theorems in Metric Topology
42- L39	Theorems in Metric Topology
43- L40	Theorems in Metric Topology
44- L41	Problems in Metric Topology
45- L42	Problems in Metric Topology
46- L43	Problems in Metric Topology
47- L44	Problems in Metric Topology
48- L45	Problems in Metric Topology
49- L46	Problems in Metric Topology
50- L47	Problems in Metric Topology
51- P3	**Department Seminar**
52- L48	Problems in Metric Topology
53- L49	Unit IV Seperation axioms and the definition of the Connected space
54- L50	Examples for connected spaces
55- L51	Theorems in connected spaces
56-L52	Homeomorphism to connected spaces - **Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
57-L53	Theorems in connected spaces
58-L54	Theorems in connected spaces
59-IT-II	**Internal Test-II**
60- L55	Theorems in connected spaces
61- L56	Theorems in connected spaces - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorems in connected spaces
63- L58	Problems in connected spaces
64- L59	Problems in connected spaces
65- L60	Definition of Compact spaces and examples
66- L61	Theorems in connected spaces
67- L62	Theorems in connected spaces
68- L63	Problems in connected spaces
69- L64	Problems in connected spaces
70- L65	Unit V – Limit Point Compactness Theorem
71- L66	Limit Point Compactness Theorem
72- L67	Limit Point Compactness Theorem
73- L68	Problems in Limit Point Compactness Theorem
74-P4	**College level meeting/ function**
75- L69	Problems in Limit Point Compactness Theorem
76- L70	Problems in Limit Point Compactness Theorem
77- L71	Problems in Limit Point Compactness Theorem
78- L72	Problems in Limit Point Compactness Theorem
79- L73	Connected spaces to Limit point compactness- **Allotting portion for Internal Test-III**
	Internal Test III begins on 08.10.2018
80- L74	Some Exercise problems for revision
81- L75	Some Exercise problems for revision
82-IT-III	**Internal Test-III**
83- L76	Some Exercise problems for revision

84- L77	Some Exercise problems for revision - **Test Paper distribution and result analysis**
85- L78	Some Exercise problems for revision
	Entering Internal Test-III Marks into University portal
	Model test begins on 22.10.2018
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Topology I"
CO1	Define the notion of limit of a function at agiven point and if there exists estimate the limit
CO2	Define the notion of metric space,construct the topology by using the metric and using this topology identify the continuity of the functions which are defined between metric.
CO3	Use the open ball on metric spaces, construct the metric topology and define open-closed sets of the space.
CO4	Define the notion of Topology
CO5	Define the subspace topology

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Operations Research
Course Code	PMAM34
Class	II year (2018-2019)
Semester	Odd
Staff Name	J. Vijaya Xavier Parthiban
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

This course deals with network models, dynamic and integer programming, inventory and queuing theory, nonlinear programming, and provide the mathematical basis behind these techniques. The aim of this course is to help the students to understand and apply some of the widely used techniques of Operations Research.

Syllabus

Operations Research (75 Hours)

Unit I: Transportation Models And Its Variants: Definition Of The Transportation Model – Nontraditional 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.

Chapter 11 – Sections 11.1, 11.2, 11.3, Chapter 16 – Sections 16.1, 16.2 and Exercise problems.

Unit V: Queuing Theory: Basic Elements Of Queuing Model – Role Of Poisson And Exponential Distributions – Pure Birth And Death Models – Specialised Poisson Queues

Chapter 17 – Sections 17.2, 17.3, 17.4, 17.6(upto 17.6.3) and Exercise problems.

Text Book:

2. Operations Research(Sixth Edition) , Hamdy A. Taha, Prentice Hall Of India Private Limited, New Delhi.

Books for Reference:

1. Introduction to Operations Research – Fredrick, Shiller, GenraldJ.Literman – MC Graw Hill (2017)

2. Operations Research – KantiSwarup, P.K. Gupta, Man Mohan – Sultan Chand and sons. (2016)

3. Operations Research (Fifth edition) J.N Sharma, McMillian Publications (2013)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2018
1-L1	Introduction
2-L2	Transportation Models And Its Variants: Definition Of The Transportation Model
3- L3	Transportation Models And Its Variants: Definition Of The Transportation Model
4-L4	Transportation Models And Its Variants: Definition Of The Transportation Model
5-L5	Transportation Models And Its Variants: Definition Of The Transportation Model
6-L6	Nontraditional Transportation Model
7-L7	Nontraditional Transportation Model
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Nontraditional Transportation Model
10- L9	Transportation Algorithm

11-L10	Transportation Algorithm
12-L11	Transportation Algorithm
13-L12	The Assignment Model
14-L13	The Assignment Model
15-L14	The Assignment Model
16-L15	Network Analysis: Network Definitions
17- L16	Network Analysis: Network Definitions
18- L17	Minimal Spanning Tree Algorithm
19- L18	Minimal Spanning Tree Algorithm
20- L19	Minimal Spanning Tree Algorithm
21- L20	Problem discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins(30.07.2018)
22- L21	Shortest Route Problem
23- IT-1	**Internal Test-I**
24- L22	Shortest Route Problem
25- L23	Maximum Flow Model
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Maximum Flow Model
28- L26	CPM
29- L27	CPM
30- P2	**College level meeting/Cell function**
31-L28	PERT
32-L29	PERT
33-L30	Integer Linear Programming: Introduction
34- L31	Integer Linear Programming: Introduction
35- L32	Integer Linear Programming: Introduction
36- L33	Applications
37- L34	Applications
38-L35	Integer Programming Solutions
39- L36	Integer Programming Solutions
40- L37	Integer Programming Solutions
41- L38	Algorithms
42-P3	**Department Seminar**
43- L39	Algorithms
44- L40	Inventory Theory: Basic Elements Of An Inventory Model
45- L41	Inventory Theory: Basic Elements Of An Inventory Model
46- L42	Inventory Theory: Basic Elements Of An Inventory Model
47- L43	Problem discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins(03.09.2018)
48- L44	Deterministic Models: Single Item Stock Model With And Without Price Breaks
49-IT-II	**Internal Test-II**
50-L45	Deterministic Models: Single Item Stock Model With And Without Price Breaks
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Multiple Items Stock Model With Storage Limitations

53- L48	Multiple Items Stock Model With Storage Limitations
54- L49	Probabilistic Models
55- L50	Probabilistic Models
56- L51	Continuous Review Model
57- L52	Continuous Review Model
58- L53	Continuous Review Model
59-P4	**College level meeting/ function**
60- L54	Queuing Theory: Basic Elements Of Queuing Model
61- L55	Queuing Theory: Basic Elements Of Queuing Model
62- L56	Role Of Poisson And Exponential Distributions
63- L57	Role Of Poisson And Exponential Distributions
64- L58	Problem discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins(08.10.2018)
65- L59	Pure Birth And Death Models
66- L60	Pure Birth And Death Models
67-IT-III	**Internal Test-III**
68- L61	Specialised Poisson Queues
69- L62	Specialised Poisson Queues
70- L63	**Test Paper distribution and result analysis**
	Revision
71-MT	**Entering Internal Test-III Marks into University portal**
72-MT	**Model Test (22.10.2018)**
73-MT	**Model Test**
74-L64	**Model Test**
75-L65	**Model test paper distribution and previous year university question paper discussion**
	Feedback of the Course, analysis and report preparation

Course Outcomes

Learning Outcomes	**COs** of the course "Operations Research"
CO1	To modify real life into Standard Mathematical Models.
CO2	To learn different optimization techniques.
CO3	To know classification of different structured problems.
CO4	Basic computing knowledge and techniques at undergraduate level.
CO5	Identification of actual problems and its equivalent mathematical models.
CO6	Application to different optimization techniques in real life situations.
CO7	Knowledge gained in utilization of Optimum Resources.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Research Methodology
Course Code	**PMAM35**
Class	II year (2018-2019)
Semester	Odd
Staff Name	Alwin Asir
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To understand the Basic aspects in research
- To learn Mathematical and Statistical technique for research
- To acquire basic knowledge about various instruments and techniques in Mathematical research.

Syllabus

MSU / 2017-18 / PG –Colleges / M.Sc.(Mathematics) / Semester -III

Research Methodology

Unit I : Research Project

Research Project – Difference between a dissertation and a thesis– Basic requirements of a research degree –Writing a proposal –Ethical considerations

Unit II : Components of a Research Project

Different components of a research project–Literature review – Methodology – Results / data – Conclusions – Bibliography - Appendices.

Unit III : Some Special Distributions

The Gamma and Chi – Square distribution – The normal distribution

Unit IV : Sampling Theory

Transformation of variables – t & F distributions.

Unit V : Random variables

The MGF technique – Distributions of $\bar{X}$ and $\frac{ns^2}{\sigma^2}$ - Expectations of functions of random variables-The Central Limit Theorem.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2018
1-L1	UNIT I : RESEARCH PROJECT – Introduction - Research Project
2-L2	Explaining about dissertation
3- L3	Explaining about a thesis
4-L4	Difference between a dissertation and a thesis
5-L5	Basic requirements of a research degree
6-L6	Discuss about originality
7-L7	Other requirements of the thesis
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Writing a proposal
10- L9	Format of a proposal
11-L10	Ethical considerations
12-L11	UNIT II : COMPONENTS OF A RESEARCH PROJECT –General introduction
13-L12	Different components of a research project
14-L13	Preliminary section, Body of the work, Supporting sections
15-L14	Title page - **Allotting portion for Internal Test-I**
	Internal Test I begins 30.07.2018
16-L15	Abstract of the project
17-IT-1	**Internal Test-I**
18-L16	Acknowledgement Section
19-L17	List of contents - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Literature review
21- L19	Methodology – Results / data
22- P2	**College level meeting/Cell function**
23-L20	Conclusions – Bibliography - Appendices.
24-L21	UNIT III : SOME SPECIAL DISTRIBUTIONS –Introduction to distributions
25-L22	Gamma distribution – Mean ,Variance and MGF
26-L23	Problems on gamma distribution
27-L24	Derivation of Normal distribution
28-L25	Normal distribution – Mean ,Variance and MGF

29-L26	Properties of Normal distribution
30-L27	Problems on Normal distribution
31-L28	Derivation of Chi-square distribution
32-L29	Chi-square distribution – Mean ,Variance and MGF
33-L30	Problems on Chi-square distribution
34- P3	**Department Seminar**
35-L31	UNIT IV : SAMPLING THEORY – Introduction to transformation of variables
36-L32	Distribution of functions of random variables - **Allotting portion for Internal Test-II**
	Internal Test II begins 03.09.2018
37- L33	Random samples
38- IT-II	**Internal Test-II**
39-L34	Problems on Random samples
40-L35	Transformation of variables of the discrete type - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Problems on Transformation of variables of the discrete type
42- L37	Transformation of variables of the continuous type
43- L38	Problems on Transformation of variables of the continuous type
44- P4	**College level meeting/ function**
45-L39	Derivation of t-distribution and problems
46-L40	Derivation of F-distribution and problems
47-L41	UNIT V : RANDOM VARIABLES – Introduction
48-L42	The MGF Technique
49-L43	Problems on MGF technique
50-L44	Distributions of $\bar{X}$ and $\frac{ns^2}{\sigma^2}$- **Allotting portion for Internal Test-III**
	Internal Test III begins 08.10.2018
51 L45	Problems on $\bar{X}$ and $\frac{ns^2}{\sigma^2}$
52- L46	The Central Limit Theorem
53-IT-III	**Internal Test-III**
54-L47	Expectations of functions of random variables
55-L48	Problems onExpectations of functions of random variables - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test 22.10.2018**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course "Research Methodology"
CO1	Training and participating in active research activities for their academic and professional levels.
CO2	Creation of novel ideas and simple technique useful to society(R/D)
CO3	Acquire background knowledge in research publication and thesis writing.
CO4	Develop skills in quantitative data analysis and presentation
CO5	Develop advanced critical thinking skills
Integrated Activity	
IA1	Preparing a thesis model
IA2	Able to understand graphical representations and statistical information in media and daily life

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Advanced Algebra – I
Course Code	**PMAM33**
Class	II year (2018-2019)
Semester	Odd
Staff Name	C. Henrietta Johnsy
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To introduce some of the most fundamental algebraic structures like inner product space, dual space, etc.
- To know the relation between the expression of matrix and linear transformations.
- Explain some of the canonical forms: Triangular form, Nilpotent form and Jordan decomposition form.
- Introduce the notation of general matrix and its properties.
- To understand the concepts of normal, unitary, Hermitian, skew-Hermitian matrices.

Syllabus

MSU / 2017-18 / PG –Colleges / M.Sc.(Mathematics) / Semester -III / Ppr.no.14 / Core-13

Advanced Algebra I (75 Hours)

Unit I: **Vector spaces:** Dual spaces – Inner product spaces.

Sections: 4.3 and 4.4.

Unit II: **Linear transformations:** The Algebra of linear transformations –

Characteristic roots – Matrices. **Sections:** 6.1 – 6.3.

Unit III: Canonical Forms: Triangular form – Nilpotent form – Jordan form.

Sections: 6.4 - 6.6.

Unit IV: Matrices: Trace and transpose – Determinants.

Sections: 6.8-6.9

Unit V: Transformations: Hermitian, unitary and normal transformations.

Sections: 6.10(Up to Lemma 6.10.11)

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begins on 18.06.2018
1-L1	Unit I – Introductory Class – Basic concepts of vector spaces, linearly independence and bases
2-L2	Linear transformation between vector spaces, Dual Spaces
3- L3	Basic Properties in dual space Hom(V, W)
4-L4	The Dual space
5-L5	Theorem of isomorphism between a vector space and its dual space
6-L6	Annihilator of a subspace in a vector space and its properties
7-L7	First isomorphism theorem on vector spaces
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Definition of inner product space and its examples
10- L9	Norm value of a vector and proof of Schwarz inequality
11-L10	Orthogonal property, orthogonal complement of a set, orthonormal set and necessary properties on it
12-L11	Gram-Schmidt Orthogonalization process and explanation using an example
13-L12	Unique representation of a vector space as a direct sum of subspace and its orthogonal complement
14-L13	Unit II – The algebra of linear transformations and definition of algebra and the notation $A_F(V)$=Hom(V, V).
15-L14	Cayley's theorem on algebra
16-L15	Polynomials over a field, minimal polynomials, roots of a polynomial in algebra and some theorems
17- L16	Singular elements and regular elements in A(V)
18- L17	Properties on singular and regular elements and invertible linear transformations
19- L18	Range and Rank of a linear transformation r(T) and its properties
20- L19	Problem discussion on rank
21- L20	Characteristic roots of a linear transformation on a finite-dimensional vector space over a field – **Allotting portion for Internal Test-I**
	Internal Test I begins (30.07.2018)
22- L21	Characteristic vectors of a linear transformation and some necessary conditions on it
23- IT-1	**Internal Test-I**

24- L22	Matrix representation of a linear transformation with respect to basis elements
25- L23	Illustrate the matrix representations of differentiable operator with respect to different bases
26- L24	Defining the generalized matrix and its properties –**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Algebra isomorphism between A(V) and F_n by T – > m(T)
28- L26	Similarities between matrices of a linear transformation T with respect to different bases
29- L27	Unit III –Canonical form: 1 Triangular form, similarities between linear transformations, invariant space under T
30- P2	**College level meeting/Cell function**
31-L28	Sufficient condition for a matrix of T to be triangular (in terms of characteristic roots of matrix)
32-L29	Structure of the polynomial of T which is in triangular form
33-L30	Canonical form: 2 Nilpotent transformations,
34- L31	Matrix of linear transformation T with respect to the decomposition of V
35- L32	Index of nilpotence; the general structure of the matrix of a nilpotent transformation
36- L33	Existence of invariant subspace of a vector space V that decompose V.
37- L34	Necessary and sufficient condition for two nilpotent transformation to be similar.
38- L35	Canonical form: 3 Jordan Form (Jordan decomposition of a finite-dimensional vector space)
39- L36	Structure of a minimal polynomial of T_i on V_i where V is the direct sum of V_i's where i> 1.
40- L37	Jordan block belonging to characteristic roots, Jordan canonical form and its matrix
41- L38	Necessary and sufficient condition for that a linear transformation can be brought to the same Jordan form
42-P3	**Department Seminar**
43- L39	Unit IV – Trace of a matrix, properties of linearity and commutativitywhen trace is considered as functions on F_n
44- L40	Trace of a linear transformations, trace of T is as the sum of its characteristic roots
45- L41	Jacobson Lemma and a sufficient condition for a linear transformation T to be nilpotent (using trace of T)
46- L42	Transpose of a matrix and its elementary properties
47- L43	Symmetrix matrix and Skew-symmetric matrix – **Allotting portion for Internal Test-II**
	Internal Test II begins (03.09.2018)
48- L44	Adjoint of a matrix on F_n – Hermitian and skew-Hermitian matrices
49-IT-II	**Internal Test-II**
50-L45	Determinants of a matrix – defining procedure
51- L46	Some elementary properties on determinants–**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Vanishing the determinant value of a matrix that have two rows/columns are equal

53- L48	Determinant of invertible matrix and product of matrices
54- L49	Cramer's rule; necessary and sufficient condition for a matrix to be a invertible matrix
55- L50	Secular equation of a matrix and its existence for every matrix – Cayley-Hamilton Theorem
56- L51	Unit V –Unitary linear transformation - definition using inner products
57- L52	Necessary and sufficient condition for a transformation to be unitary (using orthonormal basis)
58- L53	The motivation theorem for adjoint; Hermitianadjoint of a linear transformation
59-P4	**College level meeting/ function**
60- L54	Elementary properties of Hermitianadjoint of T
61- L55	Hermitian(self-adjoint) and skew-Hermitian linear transformation
62- L56	Characteristic roots of any Hermitian transformation is real – proof argument
63- L57	Normal linear transformation
64- L58	Characteristic roots of Normal transformations – **Allotting portion for Internal Test-III**
	Internal Test III begins (08.10.2018)
65- L59	Relation between a normal transformation and its Hermitianadjoint. Relation between the characteristic roots of a normal transformation and its Hermitianadjoint
66- L60	Relation between distinct characteristic vectors belonging to distinct characteristic roots of a normal transformation – Arguments
67-IT-III	**Internal Test-III**
68- L61	Diagonalization process in the matrix of normal/unitary/Hermitian transformations
69- L62	Necessary and sufficient conditions for a normal transformation N to be a Hermitian (or Unitary) transformation
70- L63	Commutative property in normal matrix and its adjoints– **Test Paper distribution and result analysis**
	Model Test begins (22.10.2018)
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Advanced Algebra – I"
CO1	Able to asses properties implied by the definitions of groups and rings
CO2	Student can understand the notion of Dual Spaces.
CO3	Student can understand the algebra of Linear

	transformations.
CO4	Can easily explain about the fundamental algebraic structures like inner product space, linear transformations, dual space,etc.
CO5	Describe the relation between the expression of matrix and linear transformations.
CO6	Can able to discuss about characteristic roots and its characteristic vectors
CO7	Gained knowledge about the standard canonical forms, called as Triangular form, Nilpotent form and Jordan decomposition form.
CO8	Studied several properties of matrices and its determinants
CO9	Understand the concepts of normal, unitary, Hermitian, skew-Hermitian matrices as well as linear transformations
Experimental Learning	
EL1	Students are motivated to solve CSIR-NET questions depending upon matrix theory, especially trace, transpose.
EL2	Theory on Determinant matrices are induced to study with the help of examples
EL3	Gram-Schmidt Orthogonalization process can understand by integral and differential operators
Integrated Activity	
IA1	Demonstrate about the page rank using in Google – Application of Characteristic roots
IA2	Use technological tools such as computer algebra systems or graphing calculators for visualization and calculation of linear algebra concepts

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Advanced Algebra
Course Code	**HMAC11**
Class	(2014-2015)
Semester	Odd
Staff Name	1) Dr. J. Suresh Suseela
	2) Dr.G. P. Grace Prema
	3) Dr. A. Alwyn Asir
	4) Mrs. T. Santha Kumari
	5) Mr. V. Selvan
Credits	4
L. Hours /P. Hours	4 / WK
Total 60 Hrs/Sem Dept. Meetings-2 Hrs College Meetings-2 Hrs Seminars- 4 Hrs Remaining 52 Hrs	

Course Objectives

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 it's algebraic application. A pass in PG level algebra course is the prerequisite for this paper. Out come 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

Syllabus

Core Paper- I
ADVANCED ALGEBRA (60 hours)

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: Discrete valuation rings and Dedekind domains **(12 hours)**

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.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2014
1-L1	Unit-IIntroduction
2-L2	Rings
3- L3	Rings
4-L4	Rings
5-L5	Ideals
6-L6	Ideals
7-L7	Ideals
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Modules
10- L9	Modules
11-L10	Modules
12-L11	Modules
13-L12	Unit-II Introduction
14-L13	Rings fractions
15-L14	Rings fractions
16-L15	Rings fractions
17-P2	**Seminar**
18-L16	Modules fractions
19-L17	Modules fractions
20-L18	Modules fractions
21- L19	Primary Decomposition
22- P3	**College level meeting/Cell function**
23-L20	Primary Decomposition
24-L21	Primary Decomposition
25-L22	Primary Decomposition
26-L23	Unit-III Introduction
27-L24	Integral Dependence
28-L25	Integral Dependence
29-L26	Integral Dependence

30-L27	Integral valuations
31-L28	Integral valuations
32-L29	Integral valuations
33-L30	Chain conditions
34- P4	**Department Seminar**
35-L31	Chain conditions
36-L32	Chain conditions
37- L33	Chain conditions
38- P5	**Seminar**
39-L34	Unit-IV Introduction
40-L35	Noetherian Rings
41-L36	Noetherian Rings
42- L37	Noetherian Rings
43- L38	Noetherian Rings
44- P6	**College level meeting/ function**
45-L39	Artin Rings
46-L40	Artin Rings
47-L41	Artin Rings
48-L42	Artin Rings
49-L43	Unit-V Introduction
50-L44	Discrete valuation rings
51 L45	Discrete valuation rings
52- L46	Discrete valuation rings
53-P7	**Seminar**
54-L47	Discrete valuation rings
55-L48	Dedekind domains
56-L49	Dedekind domains
57-L50	Dedekind domains
58-L51	Dedekind domains
59- L52	Dedekind domains
60-P8	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-10-2014

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Advanced Analysis
Course Code	**HMAC12**
Class	(2014-2015)
Semester	Odd
Staff Name	1)Dr. Shelton Albert
	2)Dr. J. Suresh Suseela
	3)Dr. T. Santha Kumari
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Dept. Meetings-2 Hrs College Meetings-2 Hrs Seminars- 4 Hrs Remaining 52 Hrs	

Course Objectives

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 Lp 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.\

Syllabus

Core Paper IIADVANCED ANALYSIS (60 hours)

Unit I : Abstract Integration : The concept of measurability – Simple functions – Elementary properties of measures – Arithmetic in - 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 - The Riesz representation theorem. **(12 hours)**

Unit IV : - Spaces : Sub-harmonic functions – The spaces and - 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 . **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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2014
1-L1	Unit-I Introduction
2-L2	The concept of measurability
3- L3	Simple functions
4-L4	Elementary properties of measures
5-L5	Arithmetic in $[0,\infty]$
6-L6	Integration of positive function
7-L7	Integration of positive function
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Integration of complex functions
10- L9	Integration of complex functions
11-L10	The role played by sets of measure zero.
12-L11	Unit-II Introduction
13-L12	Positive Boral Measures
14-L13	Topological preliminaries
15-L14	The Riesz representation theorem
16-L15	The Riesz representation theorm
17-P2	**Seminar**
18-L16	Regularity properties of Borel measures
19-L17	Regularity properties of Borel measures
20-L18	Lebesgue measure
21- L19	Continuity properties of measurable functions.
22- P3	**College level meeting/Cell function**
23-L20	Continuity properties of measurable functions.
24-L21	Unit-III Introduction
25-L22	Complex Measures
26-L23	Total variation
27-L24	Absolute continuity
28-L25	Consequences of the Radon
29-L26	Nikodym theorem
30-L27	Bounded linear functions on L^P
31-L28	Bounded linear functions on L^P
32-L29	The Riesz representation theorem.
33-L30	The Riesz representation theorem.
34- P4	**Department Seminar**

35-L31	Unit-IV Introduction
36-L32	H^p Spaces
37- L33	Sub-harmonic functions
38- P5	**Seminar**
39-L34	The spaces H^p and N
40-L35	The theorem of F. and M.
41-L36	The theorem of F. and M.
42- L37	Reisz – Factorization theorems
43- L38	Reisz – Factorization theorems
44- P6	**College level meeting/ function**
45-L39	The shift operator
46-L40	Conjugate functions.
47-L41	Unit-V Introduction
48-L42	Fourier Transforms
49-L43	Formal properties
50-L44	The inversion theorem
51 L45	The Plancherel theorem
52- L46	The Banach algebra L^1
53-P7	**Seminar**
54-L47	Holomorphic Fourier Transforms
55-L48	Two theorems of Paley and Wiener
56-L49	Two theorems of Paley and Wiener
57-L50	Quasi-analytic classes
58-L51	The Denjoy-Careman theorem.
59- L52	The Denjoy-Careman theorem.
60-P8	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-10-2014

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2014-2015)

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Project Oriented Elective Course (Banach Algebra And Spectral Theory)
Course Code	**HMAO11**
Class	(2014-2015)
Semester	Odd
Staff Name	1)Dr. J. Suresh Suseela
	2)Dr. T. Santha kumara
Credits	4
L. Hours /P. Hours	4 / WK
Total 60 Hrs/Sem Dept. Meetings-2 Hrs College Meetings-2 Hrs Seminars- 4 Hrs Remaining 52 Hrs	

Course Objectives

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.

Syllabus

PAPER III
PROJECT ORIENTED ELECTIVE COURSE (THEORY)
BANACH ALGEBRA AND SPECTRAL THEORY (60 hours)

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.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2014
1-L1	Unit-I Introduction
2-L2	Banach algebras
3- L3	Banach algebras
4-L4	Complex Homomorphisms
5-L5	Complex Homomorphisms
6-L6	Basic properties of Spectra
7-L7	Basic properties of Spectra
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Symbolic Calculus.
10- L9	Symbolic Calculus.
11-L10	Symbolic Calculus.
12-L11	Unit-II Introduction
13-L12	Differentiation
14-L13	Differentiation
15-L14	Group of invertible elements
16-L15	Group of invertible elements
17-P2	**Seminar**
18-L16	Commutative Banach algebra
19-L17	Commutative Banach algebra
20-L18	Commutative Banach algebra
21- L19	Ideals and Homomorphisms
22- P3	**College level meeting/Cell function**
23-L20	Ideals and Homomorphisms
24-L21	Gelfand transforms.
25-L22	Gelfand transforms.
26-L23	Unit-III Introduction
27-L24	Involutions
28-L25	Involutions
29-L26	Involutions
30-L27	Applications to non commutative algebra
31-L28	Applications to non commutative algebra
32-L29	Applications to non commutative algebra
33-L30	Linear functionals.
34- P4	**Department Seminar**
35-L31	Linear functionals.

36-L32	Linear functionals.
37- L33	Unit-IV Introduction
38- P5	**Seminar**
39-L34	Bounded Operators on Hilbert spaces
40-L35	Bounded Operators on Hilbert spaces
41-L36	Bounded Operators
42- L37	Bounded Operators
43- L38	A commutativity theorem
44- P6	**College level meeting/ function**
45-L39	Resolution of the Identity
46-L40	Resolution of the Identity
47-L41	Spectral theorem
48-L42	Unit-V Introduction
49-L43	Eigen values of normal operators
50-L44	Eigen values of normal operators
51 L45	Positive operators and square roots
52- L46	Positive operators and square roots
53-P7	**Seminar**
54-L47	Group of invertible operators
55-L48	Group of invertible operators
56-L49	Group of invertible operators
57-L50	Characterization of V* algebra.
58-L51	Characterization of V* algebra.
59- L52	Characterization of V* algebra.
60-P8	**Feedback of the Course, analysis and report preparation**
	Last Working day on 31-10-2014

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2015-2016)

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Advanced Algebra
Course Code	**HMAC11**
Class	(2015-2016)
Semester	Odd
Staff Name	1) Dr. J. Suresh Suseela
	2) Dr.G. P. Grace Prema
	3) Dr. A. Alwyn Asir
	4) Mrs. T. Santha Kumari
	5) Mr. V. Selvan
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

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 it's algebraic application. A pass in PG level algebra course is the prerequisite for this paper. Out come 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

Syllabus

Core Paper- I
ADVANCED ALGEBRA (60 hours)

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: Discrete valuation rings and Dedekind domains **(12 hours)**

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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2015
1-L1	Unit-IIntroduction
2-L2	Rings
3- L3	Rings
4-L4	Rings
5-L5	Ideals
6-L6	Ideals
7-L7	Ideals
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Modules
10- L9	Modules
11-L10	Modules
12-L11	Modules
13-L12	Unit-II Introduction
14-L13	Rings fractions
15-L14	Rings fractions
16-L15	Rings fractions
17-P2	**Seminar**
18-L16	Modules fractions
19-L17	Modules fractions
20-L18	Modules fractions
21- L19	Primary Decomposition
22- P3	**College level meeting/Cell function**
23-L20	Primary Decomposition
24-L21	Primary Decomposition
25-L22	Primary Decomposition
26-L23	Unit-III Introduction
27-L24	Integral Dependence
28-L25	Integral Dependence
29-L26	Integral Dependence

30-L27	Integral valuations
31-L28	Integral valuations
32-L29	Integral valuations
33-L30	Chain conditions
34- P4	**Department Seminar**
35-L31	Chain conditions
36-L32	Chain conditions
37- L33	Chain conditions
38- P5	**Seminar**
39-L34	Unit-IV Introduction
40-L35	Noetherian Rings
41-L36	Noetherian Rings
42- L37	Noetherian Rings
43- L38	Noetherian Rings
44- P6	**College level meeting/ function**
45-L39	Artin Rings
46-L40	Artin Rings
47-L41	Artin Rings
48-L42	Artin Rings
49-L43	Unit-V Introduction
50-L44	Discrete valuation rings
51 L45	Discrete valuation rings
52- L46	Discrete valuation rings
53-P7	**Seminar**
54-L47	Discrete valuation rings
55-L48	Dedekind domains
56-L49	Dedekind domains
57-L50	Dedekind domains
58-L51	Dedekind domains
59- L52	Dedekind domains
60-P8	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29-10-2015

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Advanced Analysis
Course Code	**HMAC12**
Class	(2015-2016)
Semester	Odd
Staff Name	1)Dr. Shelton Albert
	2)Dr. J. Suresh Suseela
	3)Dr. T. Santha Kumari
Credits	4
L. Hours /P. Hours	4 / WK
Total 60 Hrs/Sem Dept. Meetings-2 Hrs College Meetings-2 Hrs Seminars- 4 Hrs Remaining 52 Hrs	

Course Objectives

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 Lp 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.\

Syllabus

Core Paper IIADVANCED ANALYSIS (60 hours)

Unit I : Abstract Integration : The concept of measurability – Simple functions – Elementary properties of measures – Arithmetic in - 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 - The Riesz representation theorem. **(12 hours)**

Unit IV : - Spaces : Sub-harmonic functions – The spaces and - 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 . **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.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2015
1-L1	Unit-I Introduction
2-L2	The concept of measurability
3- L3	Simple functions
4-L4	Elementary properties of measures
5-L5	Arithmetic in $[0,\infty]$
6-L6	Integration of positive function
7-L7	Integration of positive function
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Integration of complex functions
10- L9	Integration of complex functions
11-L10	The role played by sets of measure zero.
12-L11	Unit-II Introduction
13-L12	Positive Boral Measures
14-L13	Topological preliminaries
15-L14	The Riesz representation theorem
16-L15	The Riesz representation theorem
17-P2	**Seminar**
18-L16	Regularity properties of Borel measures
19-L17	Regularity properties of Borel measures
20-L18	Lebesgue measure
21- L19	Continuity properties of measurable functions.
22- P3	**College level meeting/Cell function**
23-L20	Continuity properties of measurable functions.
24-L21	Unit-III Introduction
25-L22	Complex Measures
26-L23	Total variation
27-L24	Absolute continuity
28-L25	Consequences of the Radon
29-L26	Nikodym theorem
30-L27	Bounded linear functions on L^P
31-L28	Bounded linear functions on L^P
32-L29	The Riesz representation theorem.
33-L30	The Riesz representation theorem.
34- P4	**Department Seminar**

35-L31	Unit-IV Introduction
36-L32	H^p Spaces
37- L33	Sub-harmonic functions
38- P5	**Seminar**
39-L34	The spaces H^p and N
40-L35	The theorem of F. and M.
41-L36	The theorem of F. and M.
42- L37	Reisz – Factorization theorems
43- L38	Reisz – Factorization theorems
44- P6	**College level meeting/ function**
45-L39	The shift operator
46-L40	Conjugate functions.
47-L41	Unit-V Introduction
48-L42	Fourier Transforms
49-L43	Formal properties
50-L44	The inversion theorem
51 L45	The Plancherel theorem
52- L46	The Banach algebra L^1
53-P7	**Seminar**
54-L47	Holomorphic Fourier Transforms
55-L48	Two theorems of Paley and Wiener
56-L49	Two theorems of Paley and Wiener
57-L50	Quasi-analytic classes
58-L51	The Denjoy-Careman theorem.
59- L52	The Denjoy-Careman theorem.
60-P8	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29-10-2015

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Project Oriented Elective Course (Banach Algebra And Spectral Theory)
Course Code	**HMAO11**
Class	(2015-2016)
Semester	Odd
Staff Name	1)Dr. J. Suresh Suseela
	2)Dr. T. Santha kumara
Credits	4
L. Hours /P. Hours	4 / WK
Total 60 Hrs/Sem Dept. Meetings-2 Hrs College Meetings-2 Hrs Seminars- 4 Hrs Remaining 52 Hrs	

Course Objectives

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.

Syllabus

PAPER III
PROJECT ORIENTED ELECTIVE COURSE (THEORY)
BANACH ALGEBRA AND SPECTRAL THEORY (60 hours)

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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2015
1-L1	Unit-I Introduction
2-L2	Banach algebras
3- L3	Banach algebras
4-L4	Complex Homomorphisms
5-L5	Complex Homomorphisms
6-L6	Basic properties of Spectra
7-L7	Basic properties of Spectra
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Symbolic Calculus.
10- L9	Symbolic Calculus.
11-L10	Symbolic Calculus.
12-L11	Unit-II Introduction
13-L12	Differentiation
14-L13	Differentiation
15-L14	Group of invertible elements
16-L15	Group of invertible elements
17-P2	**Seminar**
18-L16	Commutative Banach algebra
19-L17	Commutative Banach algebra
20-L18	Commutative Banach algebra
21- L19	Ideals and Homomorphisms
22- P3	**College level meeting/Cell function**
23-L20	Ideals and Homomorphisms
24-L21	Gelfand transforms.
25-L22	Gelfand transforms.
26-L23	Unit-III Introduction
27-L24	Involutions
28-L25	Involutions
29-L26	Involutions
30-L27	Applications to non commutative algebra
31-L28	Applications to non commutative algebra
32-L29	Applications to non commutative algebra
33-L30	Linear functionals.
34- P4	**Department Seminar**
35-L31	Linear functionals.

36-L32	Linear functionals.
37- L33	Unit-IV Introduction
38- P5	**Seminar**
39-L34	Bounded Operators on Hilbert spaces
40-L35	Bounded Operators on Hilbert spaces
41-L36	Bounded Operators
42- L37	Bounded Operators
43- L38	A commutativity theorem
44- P6	**College level meeting/ function**
45-L39	Resolution of the Identity
46-L40	Resolution of the Identity
47-L41	Spectral theorem
48-L42	Unit-V Introduction
49-L43	Eigen values of normal operators
50-L44	Eigen values of normal operators
51 L45	Positive operators and square roots
52- L46	Positive operators and square roots
53-P7	**Seminar**
54-L47	Group of invertible operators
55-L48	Group of invertible operators
56-L49	Group of invertible operators
57-L50	Characterization of V* algebra.
58-L51	Characterization of V* algebra.
59- L52	Characterization of V* algebra.
60-P8	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29-10-2015

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2015-2016)

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Project Oriented Elective Course (Banach Algebra And Spectral Theory)
Course Code	**HMAO11**
Class	(2015-2016)
Semester	Odd
Staff Name	1)Dr. J. Suresh Suseela
	2)Dr. T. Santha kumara
Credits	4
L. Hours /P. Hours	4 / WK
Total 60 Hrs/Sem Dept. Meetings-2 Hrs College Meetings-2 Hrs Seminars- 4 Hrs Remaining 52 Hrs	

Course Objectives

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.

Syllabus

PAPER III
PROJECT ORIENTED ELECTIVE COURSE (THEORY)
BANACH ALGEBRA AND SPECTRAL THEORY (60 hours)

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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2015
1-L1	Unit-I Introduction
2-L2	Banach algebras
3- L3	Banach algebras
4-L4	Complex Homomorphisms
5-L5	Complex Homomorphisms
6-L6	Basic properties of Spectra
7-L7	Basic properties of Spectra
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Symbolic Calculus.
10- L9	Symbolic Calculus.
11-L10	Symbolic Calculus.
12-L11	Unit-II Introduction
13-L12	Differentiation
14-L13	Differentiation
15-L14	Group of invertible elements
16-L15	Group of invertible elements
17-P2	**Seminar**
18-L16	Commutative Banach algebra
19-L17	Commutative Banach algebra
20-L18	Commutative Banach algebra
21- L19	Ideals and Homomorphisms
22- P3	**College level meeting/Cell function**
23-L20	Ideals and Homomorphisms
24-L21	Gelfand transforms.
25-L22	Gelfand transforms.
26-L23	Unit-III Introduction
27-L24	Involutions
28-L25	Involutions
29-L26	Involutions
30-L27	Applications to non commutative algebra
31-L28	Applications to non commutative algebra
32-L29	Applications to non commutative algebra
33-L30	Linear functionals.
34- P4	**Department Seminar**
35-L31	Linear functionals.

36-L32	Linear functionals.
37- L33	Unit-IV Introduction
38- P5	**Seminar**
39-L34	Bounded Operators on Hilbert spaces
40-L35	Bounded Operators on Hilbert spaces
41-L36	Bounded Operators
42- L37	Bounded Operators
43- L38	A commutativity theorem
44- P6	**College level meeting/ function**
45-L39	Resolution of the Identity
46-L40	Resolution of the Identity
47-L41	Spectral theorem
48-L42	Unit-V Introduction
49-L43	Eigen values of normal operators
50-L44	Eigen values of normal operators
51 L45	Positive operators and square roots
52- L46	Positive operators and square roots
53-P7	**Seminar**
54-L47	Group of invertible operators
55-L48	Group of invertible operators
56-L49	Group of invertible operators
57-L50	Characterization of V* algebra.
58-L51	Characterization of V* algebra.
59- L52	Characterization of V* algebra.
60-P8	**Feedback of the Course, analysis and report preparation**
	Last Working day on 29-10-2015

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2016-2017)

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Advanced Algebra
Course Code	**KMAC11**
Class	(2016-2017)
Semester	Odd
Staff Name	1) Dr. J. Suresh Suseela
	2) Dr.G. P. Grace Prema
	3) Dr. A. Alwyn Asir
	4) Mrs. T. Santha Kumari
	5) Mr. V. Selvan
Credits	4
L. Hours /P. Hours	4 / WK
Total 60 Hrs/Sem Dept. Meetings-2 Hrs College Meetings-2 Hrs Seminars- 4 Hrs Remaining 52 Hrs	

Course Objectives

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 it's algebraic application. A pass in PG level algebra course is the prerequisite for this paper. Out come 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

Syllabus

Core Paper- IRESEARCH AND TEACHING METHODOLOGY (60 hours)

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: Discrete valuation rings and Dedekind domains **(12 hours)**

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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2016
1-L1	Unit-I Introduction
2-L2	Rings
3- L3	Rings
4-L4	Rings
5-L5	Ideals
6-L6	Ideals
7-L7	Ideals
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Modules
10- L9	Modules
11-L10	Modules
12-L11	Modules
13-L12	Unit-II Introduction
14-L13	Rings fractions
15-L14	Rings fractions
16-L15	Rings fractions
17-P2	**Seminar**
18-L16	Modules fractions
19-L17	Modules fractions
20-L18	Modules fractions
21- L19	Primary Decomposition
22- P3	**College level meeting/Cell function**
23-L20	Primary Decomposition
24-L21	Primary Decomposition
25-L22	Primary Decomposition
26-L23	Unit-III Introduction
27-L24	Integral Dependence
28-L25	Integral Dependence
29-L26	Integral Dependence
30-L27	Integral valuations
31-L28	Integral valuations
32-L29	Integral valuations

33-L30	Chain conditions
34- P4	**Department Seminar**
35-L31	Chain conditions
36-L32	Chain conditions
37- L33	Chain conditions
38- P5	**Seminar**
39-L34	Unit-IV Introduction
40-L35	Noetherian Rings
41-L36	Noetherian Rings
42- L37	Noetherian Rings
43- L38	Noetherian Rings
44- P6	**College level meeting/ function**
45-L39	Artin Rings
46-L40	Artin Rings
47-L41	Artin Rings
48-L42	Artin Rings
49-L43	Unit-V Introduction
50-L44	Discrete valuation rings
51 L45	Discrete valuation rings
52- L46	Discrete valuation rings
53-P7	**Seminar**
54-L47	Discrete valuation rings
55-L48	Discrete valuation rings
56-L49	Discrete valuation rings
57-L50	Discrete valuation rings
58-L51	Discrete valuation rings
59- L52	Discrete valuation rings
60-P8	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-11-2016

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Advanced Analysis
Course Code	**KMAC12**
Class	(2016-2017)
Semester	Odd
Staff Name	1)Dr. Shelton Albert
	2)Dr. J. Suresh Suseela
	3)Dr. T. Santha Kumari
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Dept. Meetings-2 Hrs College Meetings-2 Hrs Seminars- 4 Hrs Remaining 52 Hrs	

Course Objectives

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 Lp 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.\

Syllabus

Core Paper IIADVANCED ANALYSIS (60 hours)

Unit I : Abstract Integration : The concept of measurability – Simple functions – Elementary properties of measures – Arithmetic in - 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 - The Riesz representation theorem. **(12 hours)**

Unit IV : - Spaces : Sub-harmonic functions – The spaces and - 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 . **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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2016
1-L1	Unit-I Introduction
2-L2	The concept of measurability
3- L3	Simple functions
4-L4	Elementary properties of measures
5-L5	Arithmetic in $[0,\infty]$
6-L6	Integration of positive function
7-L7	Integration of positive function
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Integration of complex functions
10- L9	Integration of complex functions
11-L10	The role played by sets of measure zero.
12-L11	Unit-II Introduction
13-L12	Positive Boral Measures
14-L13	Topological preliminaries
15-L14	The Riesz representation theorem
16-L15	The Riesz representation theorem
17-P2	**Seminar**
18-L16	Regularity properties of Borel measures
19-L17	Regularity properties of Borel measures
20-L18	Lebesgue measure
21- L19	Continuity properties of measurable functions.
22- P3	**College level meeting/Cell function**
23-L20	Continuity properties of measurable functions.
24-L21	Unit-III Introduction
25-L22	Complex Measures
26-L23	Total variation
27-L24	Absolute continuity
28-L25	Consequences of the Radon
29-L26	Nikodym theorem
30-L27	Bounded linear functions on L^P
31-L28	Bounded linear functions on L^P
32-L29	The Riesz representation theorem.
33-L30	The Riesz representation theorem.
34- P4	**Department Seminar**

35-L31	Unit-IV Introduction
36-L32	H^p Spaces
37- L33	Sub-harmonic functions
38- P5	**Seminar**
39-L34	The spaces H^p and N
40-L35	The theorem of F. and M.
41-L36	The theorem of F. and M.
42- L37	Reisz – Factorization theorems
43- L38	Reisz – Factorization theorems
44- P6	**College level meeting/ function**
45-L39	The shift operator
46-L40	Conjugate functions.
47-L41	Unit-V Introduction
48-L42	Fourier Transforms
49-L43	Formal properties
50-L44	The inversion theorem
51 L45	The Plancherel theorem
52- L46	The Banach algebra L^1
53-P7	**Seminar**
54-L47	Holomorphic Fourier Transforms
55-L48	Two theorems of Paley and Wiener
56-L49	Two theorems of Paley and Wiener
57-L50	Quasi-analytic classes
58-L51	The Denjoy-Careman theorem.
59- L52	The Denjoy-Careman theorem.
60-P8	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-11-2016

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Project Oriented Elective Course (Banach Algebra And Spectral Theory)
Course Code	**KMAO11**
Class	(2016-2017)
Semester	Odd
Staff Name	1)Dr. J. Suresh Suseela
	2)Dr. T. Santha kumara
Credits	4
L. Hours /P. Hours	4 / WK
Total 60 Hrs/Sem Dept. Meetings-2 Hrs College Meetings-2 Hrs Seminars- 4 Hrs Remaining 52 Hrs	

Course Objectives

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.

Syllabus

PAPER III
PROJECT ORIENTED ELECTIVE COURSE (THEORY)
BANACH ALGEBRA AND SPECTRAL THEORY (60 hours)

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.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16-6-2016
1-L1	Unit-I Introduction
2-L2	Banach algebras
3- L3	Banach algebras
4-L4	Complex Homomorphisms
5-L5	Complex Homomorphisms
6-L6	Basic properties of Spectra
7-L7	Basic properties of Spectra
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Symbolic Calculus.
10- L9	Symbolic Calculus.
11-L10	Symbolic Calculus.
12-L11	Unit-II Introduction
13-L12	Differentiation
14-L13	Differentiation
15-L14	Group of invertible elements
16-L15	Group of invertible elements
17-P2	**Seminar**
18-L16	Commutative Banach algebra
19-L17	Commutative Banach algebra
20-L18	Commutative Banach algebra
21- L19	Ideals and Homomorphisms
22- P3	**College level meeting/Cell function**
23-L20	Ideals and Homomorphisms
24-L21	Gelfand transforms.
25-L22	Gelfand transforms.
26-L23	Unit-III Introduction
27-L24	Involutions
28-L25	Involutions
29-L26	Involutions
30-L27	Applications to non commutative algebra
31-L28	Applications to non commutative algebra
32-L29	Applications to non commutative algebra
33-L30	Linear functionals.
34- P4	**Department Seminar**
35-L31	Linear functionals.

36-L32	Linear functionals.
37- L33	Unit-IV Introduction
38- P5	**Seminar**
39-L34	Bounded Operators on Hilbert spaces
40-L35	Bounded Operators on Hilbert spaces
41-L36	Bounded Operators
42- L37	Bounded Operators
43- L38	A commutativity theorem
44- P6	**College level meeting/ function**
45-L39	Resolution of the Identity
46-L40	Resolution of the Identity
47-L41	Spectral theorem
48-L42	Unit-V Introduction
49-L43	Eigen values of normal operators
50-L44	Eigen values of normal operators
51 L45	Positive operators and square roots
52- L46	Positive operators and square roots
53-P7	**Seminar**
54-L47	Group of invertible operators
55-L48	Group of invertible operators
56-L49	Group of invertible operators
57-L50	Characterization of V* algebra.
58-L51	Characterization of V* algebra.
59- L52	Characterization of V* algebra.
60-P8	**Feedback of the Course, analysis and report preparation**
	Last Working day on 30-11-2016

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Research and Teaching Methodology
Course Code	PMAC11
Class	I year (2018-2019)
Semester	Odd
Staff Name	Mr. JeshuaRajan
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

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 it's algebraic application. A pass in PG level algebra course is the prerequisite for this paper. Out come 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.

Syllabus

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 educationaltechnolog. (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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begins on 18.06.2018
1-L1	Unit I – Rings and ring homomorphism; ideals and quotient rings; zero divisors, nilpotent elements and units
2-L2	Prime ideals, maximal ideals and its characterization; local ring and residue field of a ring
3- L3	Nilradical and Jacobson radical of a ring and its structure
4-L4	Operations on ideals
5-L5	Radical of an ideal and its properties
6-L6	Extension and contraction ideals
7-L7	Modules and module homomorphims
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Submodules and quotient modules
10- L9	Operations on submodules and isomorphism theorems
11-L10	Exact sequences
12-L11	Tensor product of modules
13-L12	Unit II – Construction of rings and modules of fractions
14-L13	Universal property of ring of fractions
15-L14	Proving injective, surjective flatness are a local property - **Allotting portion for Internal Test-I**

	Internal Test I begins on 30.07.2018
16-L15	Extended and contracted ideals in rings of fractions
17-IT-1	**Internal Test-I**
18-L16	Primary ideals and radical of a primary ideals
19-L17	Characterization of ideal quotients of primary ideals - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Primary decomposition of an ideal in a ring
21- L19	Isolated, embedded prime ideals;
22- P2	**College level meeting/Cell function**
23-L20	Uniqueness theorems
24-L21	Unit III – Integral element in a ring over its subring
25-L22	The going-up theorem
26-L23	Integrally closed integral domains
27-L24	Local property of integral closure
28-L25	Going-down theorem
29-L26	Valuation rings
30-L27	Ascending and descending chain conditions; Artinian and Noetherian modules
31-L28	Noetherian and Artinian modules in a short exact sequence
32-L29	Chain, length of chain, composition series of a module and uniqueness of a chain length
33-L30	Composition series and chain conditions
34- P3	**Department Seminar**
35-L31	Unit IV – Noetherian rings and its properties
36-L32	Hilbert's Basis Theorem - **Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
37- L33	Algebraic extension of a fields
38- IT-II	**Internal Test-II**
39-L34	Primary decomposition in Noetherian rings
40-L35	Irreducible ideals in a ring - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Primary ideals in a Noetherian ring
42- L37	Artin ring; equality of nilradical and Jacobson radicals in Artin ring
43- L38	Chain of prime ideals, length of chain; Relation between Artin and Noetherian ring
44- P4	**College level meeting/ function**
45-L39	Structure theorem for Artin rings
46-L40	Artin local ring and some equivalent conditions
47-L41	Unit V –Methodology of Teaching - Objectives of Teaching, Phases of Teaching
48-L42	Teaching Methods: Lecture Method, Discussion Method, Discovery Learning, Inquiry
49-L43	Problem Solving Method, Project Method,Seminar
50-L44	Integrating ICT in Teaching: Individual Instruction, Ways for Effective Presentation with PowerPoint - **Allotting portion for Internal Test-III**
	Internal Test III begins on 08.10.2018
51 L45	Documentation
52- L46	Evaluation: Formative, Summative & Continuous and Comprehensive Evaluation

53-IT-III	**Internal Test-III**
54-L47	Later Adolescent Psychology: Meaning, Physical, Cognitive, Emotional, Social and Moral Development
55-L48	Teaching Later Adolescents - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 22.10.2018
56- MT	**Model Test**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course “Research and Teaching Methodology”
CO1	To study about the advanced extension of group theory such as rings, ideals, quotient rings, radicals, ideal quotients
CO2	To extend the vector space into modules and study the various properties in module theory
CO3	Able to explain the concepts of rings and modules of fractions and can construct the primary decomposition in rings and modules
CO4	Able to explain the Integral Dependence and valuation rings
CO5	To understand about the properties of Noetherian and Artin rings
CO6	To discuss about the teaching and research methodology

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN(2016-2017)

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Advanced Algebra
Course Code	KMAC11
Class	I year (2017-2018)
Semester	Odd
Staff Name	Mr. Jeshua Rajan
Credits	4
L. Hours /P. Hours	4 / WK
Total 60 Hrs/Sem Dept. Meetings-2 Hrs College Meetings-2 Hrs Seminars- 4 Hrs Remaining 52 Hrs	

Course Objectives

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 it's algebraic application. A pass in PG level algebra course is the prerequisite for this paper. Out come 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

Syllabus

Core Paper- IRESEARCH AND TEACHING METHODOLOGY (60 hours)

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: Discrete valuation rings and Dedekind domains **(12 hours)**

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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-06-2017
1-L1	Unit-I Introduction
2-L2	Rings
3- L3	Rings
4-L4	Rings
5-L5	Ideals
6-L6	Ideals
7-L7	Ideals
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Modules
10- L9	Modules
11-L10	Modules
12-L11	Modules
13-L12	Unit-II Introduction
14-L13	Rings fractions
15-L14	Rings fractions
16-L15	Rings fractions
17-P2	**Seminar**
18-L16	Modules fractions
19-L17	Modules fractions
20-L18	Modules fractions
21- L19	Primary Decomposition
22- P3	**College level meeting/Cell function**
23-L20	Primary Decomposition
24-L21	Primary Decomposition
25-L22	Primary Decomposition
26-L23	Unit-III Introduction
27-L24	Integral Dependence
28-L25	Integral Dependence
29-L26	Integral Dependence
30-L27	Integral valuations
31-L28	Integral valuations
32-L29	Integral valuations
33-L30	Chain conditions
34- P4	**Department Seminar**
35-L31	Chain conditions

36-L32	Chain conditions
37- L33	Chain conditions
38- P5	**Seminar**
39-L34	Unit-IV Introduction
40-L35	Noetherian Rings
41-L36	Noetherian Rings
42- L37	Noetherian Rings
43- L38	Noetherian Rings
44- P6	**College level meeting/ function**
45-L39	Artin Rings
46-L40	Artin Rings
47-L41	Artin Rings
48-L42	Artin Rings
49-L43	Unit-V Introduction
50-L44	Discrete valuation rings
51 L45	Discrete valuation rings
52- L46	Discrete valuation rings
53-P7	**Seminar**
54-L47	Discrete valuation rings
55-L48	Discrete valuation rings
56-L49	Discrete valuation rings
57-L50	Discrete valuation rings
58-L51	Discrete valuation rings
59- L52	Discrete valuation rings
60-P8	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2016-2017)

(Prepared by staff member handling the course)

Programme Name	M.Phil. Mathematics
Course Name	Advanced Analysis
Course Code	KMAC12
Class	I year (2017-2018)
Semester	Odd
Staff Name	Mrs. T. Santhakumari
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Dept. Meetings-2 Hrs College Meetings-2 Hrs Seminars- 4 Hrs Remaining 52 Hrs	

Course Objectives

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 Lp 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.\

Syllabus

Core Paper IIADVANCED ANALYSIS (60 hours)

Unit I : Abstract Integration : The concept of measurability – Simple functions – Elementary properties of measures – Arithmetic in - 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 - The Riesz representation theorem. **(12 hours)**

Unit IV : - Spaces : Sub-harmonic functions – The spaces and - 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 . **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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16.06.2017
1-L1	Unit-I Introduction
2-L2	The concept of measurability
3- L3	Simple functions
4-L4	Elementary properties of measures
5-L5	Arithmetic in $[0,\infty]$
6-L6	Integration of positive function
7-L7	Integration of positive function
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Integration of complex functions
10- L9	Integration of complex functions
11-L10	The role played by sets of measure zero.
12-L11	Unit-II Introduction
13-L12	Positive Boral Measures
14-L13	Topological preliminaries
15-L14	The Riesz representation theorem
16-L15	The Riesz representation theorem
17-P2	**Seminar**
18-L16	Regularity properties of Borel measures
19-L17	Regularity properties of Borel measures
20-L18	Lebesgue measure
21- L19	Continuity properties of measurable functions.
22- P3	**College level meeting/Cell function**
23-L20	Continuity properties of measurable functions.
24-L21	Unit-III Introduction
25-L22	Complex Measures
26-L23	Total variation
27-L24	Absolute continuity
28-L25	Consequences of the Radon
29-L26	Nikodym theorem
30-L27	Bounded linear functions on L^P
31-L28	Bounded linear functions on L^P
32-L29	The Riesz representation theorem.
33-L30	The Riesz representation theorem.
34- P4	**Department Seminar**
35-L31	Unit-IV Introduction
36-L32	H^p Spaces
37- L33	Sub-harmonic functions

38- P5	**Seminar**
39-L34	The spaces H^p and N
40-L35	The theorem of F. and M.
41-L36	The theorem of F. and M.
42- L37	Reisz – Factorization theorems
43- L38	Reisz – Factorization theorems
44- P6	**College level meeting/ function**
45-L39	The shift operator
46-L40	Conjugate functions.
47-L41	Unit-V Introduction
48-L42	Fourier Transforms
49-L43	Formal properties
50-L44	The inversion theorem
51 L45	The Plancherel theorem
52- L46	The Banach algebra L^1
53-P7	**Seminar**
54-L47	Holomorphic Fourier Transforms
55-L48	Two theorems of Paley and Wiener
56-L49	Two theorems of Paley and Wiener
57-L50	Quasi-analytic classes
58-L51	The Denjoy-Careman theorem.
59- L52	The Denjoy-Careman theorem.
60-P8	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Analytical Geometry Of Three Dimensions
Course Code	SMMA21
Class	I year (2017-2018)
Semester	Even
Staff Name	Mr. JeshuaRajan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To describe the objects in three dimensions using coordinate system
- To gain some knowledge about planes in a space
- To know about lines and its properties
- Understanding the structure of spheres and intersections of known objects
- To express cones and cylinder using mathematical equations

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Core-3

ANALYTICAL GEOMETRY OF THREE DIMENSIONS: (75 Hours)

Unit I Analytical Geometry of 3D Co-ordinate system, direction cosines, direction ratios

Unit II Equation of plane in different forms - angle between planes-Length of perpendicular-angle bisection.

Unit III - Equation of a line in different forms - image of a point – image of a line-The plane and the straight line-angle between plane and line-Coplanar lines-Shortest distance between two lines

Unit IV Sphere – Tangent plane – circle of intersections – Tangency of Spheres – coaxial system of spheres - Radical Planes – Orthogonal Spheres.

Unit V Equation of a cone-cone with vertex at the orgin –Tangent plane and normal-Quadratic cone with the vertex at orgin – Right circular cone – Cylinder – Right circular cylinder-enveloping cylinder

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07.12.2017
1-L1	Unit I – Introduction to co-ordinate systems in three dimensions and distance between two points
2-L2	Finding the point dividing the line joining two points in some fixed ratio
3- L3	The centroid of a triangle using vertices in three dimensions
4-L4	Problem discussions in coordinate systems
5-L5	Problems to check the properties of given objects using coordinates and distance formula
6-L6	Projection of any three dimensions object into a two dimension plane; particularly, projection of a finite line on another straight line
7-L7	Direction cosines and direction ratios
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Relation between direction cosines and direction ratios and problem discussions
10- L9	Direction cosines of the line joining two points
11-L10	Angle between two lines whose direction cosines are given
12-L11	Conditions for perpendicularity and parallelism
13-L12	Problem discussions to verify parallel and perpendicular conditions using direction cosines
14-L13	Direction cosines of the angle bisectors
15-L14	Unit II – The general equation of the first degree in x,y,z represents a plane
16-L15	Normal form and intercept form of the equation of the plane
17- L16	Three points form of the equation of the plane; problem solving to find the equation of a plane passing through three given points
18- L17	Direction cosines of the line that is perpendicular to a plane
19- L18	Angle between two given planes
20- L19	Problems to finding the equation of planes using points on it and perpendicularity and parallelism of lines to it

21- L20	The ratio in which a plane divides the line joining the two given points – **Allotting portion for Internal Test-I**
	Internal Test I begins (22.01.2018)
22- L21	Equation of a plane through the line of intersection of two given planes
23- IT-1	**Internal Test-I**
24- L22	Problem discussion to finding plane equations using some given conditions
25- L23	Length of perpendicular from a point to the given plane
26- L24	Problem discussions – **Test Paper distribution and result analysis**
27- L25	Finding the equation of the plane bisecting the angle between two given planes
28- L26	Finding the equation of reflection of the plane in a given plane
29- L27	Unit III – Derivation of equation of a line using intersection of two given planes
30- P2	**College level meeting/Cell function**
31-L28	Symmetrical form of the equations of a line
32-L29	Finding the symmetrical form of the equations of the given line of intersection of the planes
33-L30	Equation of a straight line passing through two given points
34- L31	Finding the perpendicular distance from a point to a line (given in symmetrical form)
35- L32	Finding the perpendicular distance from a point to a lineof intersection of the planes
36- L33	Finding the image of a point in a given plane
37- L34	Finding the image of the line in a given plane
38- L35	The line and the plane – The condition for the line to be parallel to the plane
39- L36	Finding the orthogonal projection of the line on the plane
40- L37	Angle between the plane and the line; deducing the parallel condition
41- L38	Coplanar lines – Condition for the coplanarity
42-P3	**Department Seminar**
43- L39	The shortest distance between two given lines
44- L40	Unit IV – The general equation of a sphere and finding its centre and radius
45- L41	The length of the tangent from the point to the given sphere
46- L42	The plane section of a sphere is a circle
47- L43	Equation of a sphere passing through a given circle –**Allotting portion for Internal Test-II**
	Internal Test II begins (26.02.2018)
48- L44	Derivation of the equation of the tangent plane to the sphere at a point
49-IT-II	**Internal Test-II**
50-L45	Problem discussion to finding the tangent plane by the given conditions
51- L46	The equation to the circumcircle of the triangle that made by intersection of sphere and a plane – **Test Paper distribution and result analysis**
52- L47	The condition that a line should touch the given sphere represented in general form
53- L48	The equation of the sphere passing through a circle that touches a plane
54- L49	Finding the point of contact between a plane and a sphere
55- L50	Problem discussion to on sphere related to some planes
56- L51	Unit V – The Cone; Definition of right circular cone, the vertex, the axis and the semi vertical angle.
57- L52	The condition for the equation F(x,y,z)=0 to represent a cone
58- L53	The condition for the equation F(x,y,z)=0 to represent a right circular cone
59-P4	**College level meeting/ function**

60- L54	Intersection of a straight line and a quadratic cone
61- L55	The tangent plane and normal to the cone
62- L56	Obtaining the condition for the plane to touch the quadric cone
63- L57	Reciprocal cones of a given cone using locus of the normal
64- L58	The angle between the lines in which the plane cuts the cone – **Allotting portion for Internal Test-III**
	Internal Test III begins (01.04.2018)
65- L59	Cylinder – its equation using generators and guiding curves
66- L60	The equation of the right circular cylinder with given axis and given radius of the guiding circle
67-IT-III	**Internal Test-III**
68- L61	The equation of the right circular cylinder described on the circle through the points on coordinate axes as a guiding curve
69- L62	The enveloping cylinder of the surface having the generator parallel to a line passing through origin
70- L63	Problem discussion for Revision - **Test Paper distribution and result analysis**
	Model Test (12.04.2018)
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Analytical Geometry Of Three Dimensions"
CO1	Understand the objects in three dimensions using coordinate system
CO2	Difference between directional cosines and directional ratios
CO3	Able to solve problems on finding plane equations using given criteria
CO4	Explain all the forms of lines
CO5	Angle between planes – lines – plane and lines
CO6	Understand the structure of spheres and intersections of known objects
CO7	Describe the shapes by intersection of some combination of spheres, planes and lines
CO8	Expressions of the equations of cones, cylinder, right circular cones and right circular cylinder
Experimental Learning	
EL1	Discussions on cubes and cuboids using modelling
EL2	Making three dimensional understanding techniques using natural existing things
EL3	Collecting some graphs that represent the several types of sections

	of plane and cylinders
Integrated Activity	
IA1	To do modelling to express the intersection of plane and sphere
IA2	Make three dimensional objects such as, dodecahedral, cuboids, tetrahedral, etc.,

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Differential Equations
Course Code	SMMA22
Class	I year (2017-2018)
Semester	Even
Staff Name	MR. C.Prabu Daniel Pakkianathan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Identify the type of a given differential equations and select and apply the appropriate analytical technique for finding the solution of first order abd selected higher order ODE
- Evaluate first order differential equations including separable, homogeneous, exact and linear.
- Solve linear systems of ordinary differential equations
- Solve differential equations using variation of parameters.

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Core - 4

DIFFERENTIAL EQUATIONS : (75 Hours)

Unit I First order higher degree equations – solvable for x,y,p and Clairaut's form – Simultaneous differential equations of the form f1(D)x+ g1(D)y = h1(t), f2(D) x + g2(D)y = h2(t)

Unit II (Ordinary differential equation) Second order linear differential equations with constant coefficients – Find the P.I for functions of the form eax f(x) and xnf(x)

Unit III Linear equations of second order with variable coefficients – Homogeneous equations – Equation reducible to homogeneous equation.

Unit IV (Partial differential equations) Formation of equations by elimination of arbitrary constants and functions – Definition of general, particular and complete solutions – solving standard forms f(p,q) = 0, f(x, p, q) = 0, f(y, p, q) = 0, f(z, p, q) = 0, f(x, p) = f(y, q), z = px + qy + f(p,q) – Lagrange's differential equations Pp + Qq = R

Unit V Application of differential equations – Growth and Decay – chemical reaction - Newton's law of cooling – Brochistocrone problem – simple electric circuits.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	UNIT I:FIRST ORDER HIGHER DEGREE EQUATIONS – Introduction
2-L2	Equations solvable for dy/dx
3- L3	Problems on equations solvable for dy/dx
4-L4	Equations solvable for y
5-L5	Equations solvable for x
6-L6	Problems on Equations solvable for x and y
7-L7	Clairaut's form
8- P1	**Welcoming of First year and Inauguration of MathematicsAssociation**
9- L8	Problems on Clairaut's form
10- L9	Equationsthatdonotcontain x explicitly
11-L10	Equationsthatdonotcontain y explicitly
12-L11	Simultaneous differential equations
13-L12	Problems on Simultaneous differential equations
14-L13	Simultaneous differential equations with variable coefficients
15-L14	UNIT II :ORDINARY DIFFERENTIAL EQUATION - Inroduction
16-L15	Definitions of linear equations
17- L16	Second order linear differential equations with constant coefficients
18- L17	The operator D
19- L18	Complementary function of a linear equation with constant coefficients
20- L19	Problems on Complementary function of a linear equation with constant coefficients
21- L20	Particular integral - **Allotting portion for Internal Test-I**

	Internal Test I begins on 22-01-2018
22- L21	General method of finding P.I
23- IT-1	**Internal Test-I**
24- L22	Special methods of finding Particular integral
25- L23	Problems on RHS = e^{ax}
26- L24	Problems on RHS = sinax -**Test Paper distribution and result analysis**
27- L25	Problems on RHS = x^n
28- L26	Find the P.I for functions of the form $e^{ax}f(x)$ and $x^n f(x)$
29- L27	UNITIIILINEAR EQUATIONS OF SECOND ORDER WITH VARIABLE COEFFICIENTS– Introduction
30- P2	**College level meeting/Cell function**
31-L28	Problems on linear equations with variable coefficients
32-L29	Problems on by putting $z = \log x$
33-L30	Problems on finding the particular integral
34- L31	Special method of evaluating the P.I when X is of the form x^m
35- L32	Problems on without transforming with constant coefficients
36- L33	Homogeneous equations
37- L34	Problems on Homogeneous equations
38- L35	Equations reducible to the linear equations
39- L36	Problems on equations reducible to the linear equations
40- L37	Problems on equations reducible to the linear equations
41- L38	Equations reducible to the linear equations by means of the substitution
42-P3	**Department Seminar**
43- L39	Problems on Equations reducible to the linear equations by means of the substitution
44- L40	UNIT IV : PARTIAL DIFFERENTIAL EQUATIONS – Introduction
45- L41	Partial Differential Equations of the first order
46- L42	Classification of integrals
47- L43	Singular integral - **Allotting portion for Internal Test-II**
	Internal Test II begins on 26-02-2018
48- L44	General integral
49-IT-II	**Internal Test-II**
50-L45	Particular integral
51- L46	Derivation of partial differential equations -**Test Paper distribution and result analysis**
52- L47	Problems on General integral, Singular integral and Particular integral
53- L48	Elimination of constants
54- L49	Problems on Elimination of constants
55- L50	Elimination of an arbitrary function
56- L51	solving standard forms f(p,q) = 0, f(x, p, q) = 0, f(y, p, q) = 0, f(z, p, q) = 0, f(x, p) = f(y, q), z = px + qy + f(p,q)
57- L52	Lagrange's differential equations Pp + Qq = R
58- L53	UNIT V : APPLICATION OF DIFFERENTIAL EQUATIONS - Introduction
59-P4	**College level meeting/ function**
60- L54	Problems on application of differential equations
61- L55	Definitions of growth and decay
62- L56	Problems on growth and decay
63- L57	Definitions of Chemical reaction

64- L58	Problems onChemical reaction - **Allotting portion for Internal Test-III**
	Internal Test III begins on 01-04-2018
65- L59	Definitions of Newton's law of cooling
66- L60	Problems onNewton's law of cooling
67-IT-III	**Internal Test-III**
68- L61	Explanation of Brochistocrone problem
69- L62	Simple electric circuits
70- L63	Problems on Simple electric circuits - **Test Paper distribution and result analysis**
	Model Test begins on 12.04.2018
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course "Differential Equations"
CO1	Solve first order differential equations utilizing the standard techniques for separable ,exact, linear , homogeneous or Bernoulli cases
CO2	Find the particular solution when given initial or boundary conditions
CO3	Solve higher order linear differential equations using reduction of order, undetermined coefficients or variation of parameters
CO4	Solve the first and higher order linear equations with constant and variable coefficients
CO5	Able to understand the application of ordinary differential equation.
Integrated Activity	
IA1	Application of ordinary differential equation in day today life
IA2	To know about the solution of first and higher order differential equation with constant and variable coefficients

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B.Sc Mathematics
Course Name	Statistics- II
Course Code	SAST21
Class	I year (2017-2018)
Semester	Even
Staff Name	1. Mr. C.Prabu Daniel Pakkianathan 2. Mrs. T. Santhakumari
Credits	3
L. Hours /P. Hours	6 / WK
Total 90Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To know the concept of index numbers
- To study the distribution functions
- To understand the Analysis of variance

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Allied –II

Statistics (For Mathematics Students) Paper – II (90 Hours)

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 varience – 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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07.12.2017
1-L1	Index. Number Introduction
2-L2	Unweighted or Simple Index Number
3- L3	Problems
4-L4	Average of Price Relative Method
5-L5	Problem (A.M. & G.M.)
6-L6	Fixed and Chain Base Method
7-L7	Weighted Index Number
8-L8	Problems
9-L9	Ideal Index Number – 3Tests
10-P1	**Welcoming of First year and Inauguration of MathematicsAssociation**
11-L10	Some Results
12-L11	Finding the missing price
13-L12	Cost of living Index Number
14-L13	Problems
15-L14	Uses of index numbers
16-L15	Test – Circular Test
17-L16	**Time reversal test, Unit Test**
18-L17	Testing of Hypothesis
19-L18	Null and Alternating Hypothesis
20-L19	Type I, Type II errors
21-L20	Critical region, Level of Significance

22-L21	Large Samples
23-L22	Problems discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins on 22.01.2018
24-L23	Difference in Proportion
25-L24	Problems
26-IT-1	**Internal Test-I**
27-L25	Single mean
28-L26	Problems
29-L27	Difference of means
30-L28	Problems discussion -**Test Paper distribution and result analysis**
31- L29	Problems
32- L30	Derive some Formulae
33- L31	Problems
34-P2	**College level meeting/Cell function**
35- L32	Revision
36- L33	Introduction to different Distribution Tests
37- L34	Test based on χ^2Distribution
38- L35	Problems on χ^2Distribution
39- L36	Exercise Problems
40- L37	Test for Independence of Attributes
41- L38	Theorem - χ^2Test of Independence
42- L39	Yate's Corrrection
43- L40	Small Samples
44- L41	Problems on Small Samples
45- L42	t-distribution
46- L43	Goodness of Fit
47- L44	Confident Limits
48- L45	Problems on t-distribution
49- L46	Problems on t-distribution
50- L47	F-Test
51- P3	**Department Seminar**
52- L48	Problems on F-Test
53- L49	Test based on χ^2Distribution
54- L50	χ^2Test for Population Variance
55- L51	Introduction to Analysis of Variance
56-L52	One Way Classification - **Allotting portion for Internal Test-II**
	Internal Test II begins on 26.02.2018
57-L53	Example Problems
58-L54	Exercise Problems
59-IT-II	**Internal Test-II**
60- L55	Two Way Classification
61- L56	Example Problems-**Test Paper distribution and result analysis**
62- L57	Example Problems
63- L58	Exercise Problems
64- L59	Basis of Experimental Design
65- L60	Randomized Block Design
66- L61	Latin Square
67- L62	Example Problems on Latin Square

68- L63	Introduction to SQC
69- L64	SQC
70- L65	Definitions and Examples
71- L66	Advantages and Problems
72- L67	Process Control
73- L68	Control Chart, Examples
74-P4	**College level meeting/ function**
75- L69	Mean Chart - Example
76- L70	Range Chart - Example
77- L71	P Chart - Example
78- L72	Product Control
79- L73	Problems on control charts - **Allotting portion for Internal Test-III**
	Internal Test III begins on 01.04.2018
80- L74	Problems
81- L75	Sampling Inspection
82-IT-III	**Internal Test-III**
83- L76	Problems
84- L77	Problems on control charts - **Test Paper distribution and result analysis**
85- L78	Problems on control charts
	Model test begins on 12.04.2018
86-MT	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89- L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course “Statistics - II”
CO1	To analyse the ideas in index number and its applications
CO2	Identify the characteristics of different discrete and continuous distributions.
CO3	To gain the knowledge about different Distribution Tests, such as, the t, F and χ^2 distributions and their applications
CO4	Able to study an introduction to Analysis of Variance, and one / two way classification methods
CO5	Able to understand the process chart and control charts, particularly, mean chart, range chart and P-chart.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Value Based Education
Course Code	SNMA3A
Class	I year (2017-2018)
Semester	Even
Staff Name	Mr. C. Prabhu Daniel Packiyanathan
Credits	2
L. Hours /P. Hours	2 / WK
Total 30Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 20 Hrs (5 units; 5×4=20; 4Hrs /unit)	

Course Objectives

To enable the students to understand the social realities and to inculcate an essential value system towards building a health society

Syllabus

Unit I: Social Justice Definition – need – parameters of social justice – factors responsible for social injustice – caste and gender – contributions of social reformers.

Unit II : Human Rights and Marginalized People Concept of Human Rights – Principles of human rights – human rights and Indian constitution – Rights of Women and children – violence against women – Rights of marginalized People – like women, children, dalits, minorities, physically challenged etc

Unit III: Social Issues and Communal Harmony Social issues – causes and magnitude - alcoholism, drug addiction, poverty, unemployment etc – communal harmany –concept – religion and its place in public in public domain – separation of religion from politics – secularism role of civil society

Unit IV: Media Education and Globalized World Scenario Mass media –functions – characteristics –need and purpose of media literacy – effects and influence - - youth and children – media power – socio cultural and political consequences mass mediated culture - - consumeristic culture – Globalization – new media- prospects and challenges

Unit V: Values and Ethics Personal values – family values – social values – cultural values – Professional values – and overall ethics – duties and responsibilities

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begins on 07.12.2017
1-L1	Unit I: Social Justice Definition – need
2-L2	Parameters of social justice
3- P1	**Welcoming of First year and Inauguration of Department Association**
4-L3	Factors responsible for social injustice – caste and gender
5-L4	Contributions of social reformers–**Allotting portion for Internal Test-I**
	Internal Test I beginson 22.01.2018
6-IT-I	**Internal Test-I**
7-L5	Unit II : Concept of Human Rights – Principles of human rights – human rights and Indian constitution – **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
8-L6	Rights of Women and children – violence against women
9-L7	Rights of marginalized People – like women, children, dalits, minorities, physically challenged etc
10-P2	**College level meeting/Cell function**
11-L8	Unit III: Social Issues and Communal Harmony - Social issues – causes and magnitude
12-L9	Alcoholism, drug addiction, poverty, unemployment etc
13-P3	**Department Seminar**
14-L10	Communal harmany –concept –religion and its place in public in public domain
15-L11	Separation of religion from politics –secularism role of civil society
16-L12	Unit IV: Media Education and Globalized World Scenario – Mass media – functions –characteristics –need and purpose of media literacy – effects and influence –**Allotting portion for Internal Test-II**
	Internal Test II beginson 26.02.2018
17-IT-1	**Internal Test-II**
18-L13	Youth and children – media power – socio cultural and political consequences mass mediated culture - consumeristic culture –**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
19-L14	Globalization – new media- prospects and challenges
20- P2	**College level meeting/ function**
21-L15	**Unit V: Values and Ethics** Personal values – family values
22-L16	Social values – cultural values

23- L17	Professional values – and overall ethics- **Allotting portion for Internal Test-III**
	Internal Test III beginson 01.04.2018
24- IT-III	**Internal Test-III**
25-L18	Duties and responsibilities–**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 12.04.2018
26-MT	**Model Test**
27-MT	**Model Test**
28-MT	**Model Test**
29-L19	**Model test paper distribution and previous year university question paper discussion**
30-L20	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Value Based Education"
CO1	Able to understand the social realities
CO2	Enable the students to inculcate an essential value system towards building a health society
CO3	To understand about the social issues and communal harmony in public domain
CO4	To gain the knowledge in Mass media functions, its characteristics and its power
CO5	To know the Globalized world scenario
CO6	To discuss the personal, family, social and cultural values and its ethics

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Mathematics for Competitive Examinations-II
Course Code	SNMA4A
Class	II year (2017-2018)
Semester	Even
Staff Name	C.Prabu Daniel Pakkianathan
Credits	2
L. Hours /P. Hours	2 / WK
Total 30Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 20 Hrs (5 units; 5×4=20; 4Hrs /unit)	

Course Objectives

- To learn the problems solving techniques for aptitude problems
- To enable the students prepare themselves for various competitive examinations

Non – Major Elective Paper – II

Mathematics for Competitive Examinations -II (30 Hours) (SNMA4A)

Unit I Simple Interest – Compound interest **6L**

Unit II Time and work **7L**

Unit III Time and distance **7L**

Unit IV Chain Rule **5L**

Unit V Pipes and Cistern **5L**

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07.12.2017
1-L1	Introduction about Simple Interest and formulae
2-L2	Find the simple interest problems discussed
3- P1	**Welcoming of First year and Inauguration of MathematicsAssociation**
4-L3	Introduction about Compound Interest
5-L4	formulae and workout examples - **Allotting portion for Internal Test-I**
	Internal Test I begins on 22.01.2018
6-IT-I	**Internal Test-I**
7-L5	workout examples -**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
8-L6	Introduction about time and work and workout examples
9-L7	Solved examples and workout exercise problems
10-P2	**College level meeting/Cell function**
11-L8	Introduction about time and distance and workout examples
12-L9	Solved examples and workout exercise problems
13-P3	**Department Seminar**
14-L10	Introduction about chain rule and workout examples
15-L11	Solved examples and workout exercise problems
16-L12	workout examples - **Allotting portion for Internal Test-II**
	Internal Test II begins on 26.02.2018
17-IT-1	**Internal Test-II**
18-L13	workout examples -**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
19-L14	Introduction about pipes and cistern and workout examples
20- P2	**College level meeting/ function**
21-L15	Solved examples and workout exercise problems
22-L16	Semester Model questions discusse
23- L17	Semester Model questions discusse - **Allotting portion for Internal Test-III**
	Internal Test III begins on 01.04.2018
24- IT-III	**Internal Test-III**
25-L18	Semester Model questions discusse - **Test Paper distribution and result analysis**
	Model Test begins on 12.04.2018
	Entering Internal Test-III Marks into University portal
26-MT	**Model Test**
27-MT	**Model Test**
28-MT	**Model Test**
29-L19	**Model test paper distribution and previous year university question paper discussion**
30-L20	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course “Mathematics for Competitive Examinations -II”
CO1	Students can able to solve simple interest and compound interest in Tnpsc examinations
CO2	calculate time and distance
CO3	Calculate time and work

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	CALCULUS
Course Code	SMMA11
Class	I year (2017-2018)
Semester	Odd
Staff Name	Mrs. T. Santhakumari
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To define the curvature and its radius and discuss its properties in both cartesian and polar coordinate systems
- Define curve, graph, in volute and evolutes and solve related problems
- Study the curve tracing techniques on graphs and discuss some properties graphically
- Discuss the concepts of asymptotes, especially the asymptotes parallel to axes and inclined lines
- To examine various techniques of integration and apply them to definite and improper integrals
- To study about special integral functions, called beta and gamma functions

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – I / Core-1

CALCULUS (75 Hours)

Unit I : Curvature,Radius of Curvature and Centre of curvature in Cartesian and polar Coordinates

Unit II Pedal Equation-Involute and evolute-Asymptotes

Unit III Singular Points(Node,cusp,conjugate points)-Tracing of curves (cartesian only)

Unit IV Double and Triple Integrals - Changing the order of integration - Jacobians and change of variables

Unit V Beta and Gamma functions – Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals, Improper Integrals.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begins on 16.06.2017
1-L1	Unit I – Introduction and some basic definitions
2-L2	Curvature, centre of curvature and radius of curvature
3- L3	Cartesian formula for radius of curvature
4-L4	Problems in radius of curvature
5-L5	Parametric equation for rho
6-L6	Exercise problem discussion
7-L7	Polar form of radius of curvature
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Problems under polar form
10- L9	Centre of curvature
11-L10	Problems in centre of curvature
12-L11	p – r equations
13-L12	Finding the p – r equation of a curve
14-L13	Problem discussion on p – r equations
15-L14	Unit II – Definitions of Evolute and involute
16-L15	Finding the evolute of a parabola
17- L16	Finding the evolute of a hyperbola
18- L17	Finding the evolute of an ellipse
19- L18	Finding the radius of curvature using p – r equations
20- L19	Linear asymptotes – an introduction
21- L20	Finding the asymptotes parallel to axes - **Allotting portion for Internal Test-I**
	Internal Test I begins on 31.07.2017
22- L21	Finding the asymptotes for the equation of the type $F_n + F_{n-2} = 0$
23- IT-1	**Internal Test-I**
24- L22	Problems to find the linear asymptotes
25- L23	Exercise problem discussion
26- L24	The asymptotes for the equation of the type $(ax + by + c)^2 F_{n+2} + F_{n-2} = 0$ - **Test Paper distribution and result analysis**
27- L25	Asymptotes by inspection
28- L26	Intersection of curve with asymptotes
29- L27	Unit III – Singular points: definitions of node, cusp and conjugate points
30- P2	**College level meeting/Cell function**
31-L28	Species of double points
32-L29	Investigate the nature of the origin
33-L30	Problems on node, cusp and conjugate points
34- L31	Determine the species of a cusp

35- L32	Problems on double points
36- L33	Problems to find the nature of the singular points on some curve
37- L34	Tracing of curves – short notes
38- L35	Steps to tracing a curve
39- L36	Problems on tracing of a curve
40- L37	Trace the curve – Problem discussion
41- L38	Problems discussion
42-P3	**Department Seminar**
43- L39	Unit IV – Integration - Recall
44- L40	Evaluation of the double integrals in cartesian coordinates
45- L41	Problems to solve the double integrals
46- L42	Changing the order of integration
47- L43	Problems in change of order of an integration - **Allotting portion for Internal Test-II**
	Internal Test II begins on 30.08.2017
48- L44	Exercise problems discussion
49-IT-II	**Internal Test-II**
50-L45	Double integrals in polar coordinates
51- L46	Problems to find the double integrals in polar coordinates - **Test Paper distribution and result analysis**
52- L47	Triple integrals – solving method
53- L48	Problems on triple integrals
54- L49	Change of variables - Jacobian matrix and some important rules regarding Jacobian
55- L50	Transformation from cartesian to spherical coordinates
56- L51	Unit V – Improper integrals
57- L52	Problems on improper integrals
58- L53	Discussions on the convergence of some integrals
59-P4	**College level meeting/ function**
60- L54	Beta function – definition and some basic results
61- L55	Properties on beta function
62- L56	Gamma function – definition and some basic results
63- L57	Recurrence formula for Gamma function
64- L58	Further properties on beta function - **Allotting portion for Internal Test-III**
	Internal Test III begins on 03.10.2017
65- L59	Relation between beta and gamma functions
66- L60	Evaluations of some integral values using beta, gamma functions
67-IT-III	**Internal Test-III**
68- L61	Applications to gamma function
69- L62	Problem discussion on beta, gamma functions
70- L63	Problems on beta, gamma functions - **Test Paper distribution and result analysis**
	Model Test begins on 19.10.2017
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**

75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "CALCULUS"
CO1	Gain the knowledge on radius of curvature and can able to find radius of curvature for given surface in polar and cartesian coordinates
CO2	Able to solve problems on tracing of curve and analyse the properties graphically
CO3	Understand about singular points and able to explain the nodes, cusp and conjugate points
CO4	Analyse the concept of asymptotes which is parallel to both axis as well as to any inclined lines
CO5	Examine various techniques of integration and apply them to definite and improper integrals
CO6	Gain knowledge about special integral functions, called beta and gamma functions

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature

Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	CLASSICAL ALGEBRA
Course Code	SMMA12
Class	I year (2017-2018)
Semester	Odd
Staff Name	Mr. Jeshua Rajan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Gain the knowledge of theory of equations.
- Understanding the concept of Powers of the roots of the equations
- To provide the understanding of Newton's method, Horner's method

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – I / Core - 2

CLASSICAL ALGEBRA (75 Hours)

Unit I Theory of Equations – Formation of equations – Relation between roots and coefficients – symmetric function of the roots.

Unit II Sum of the powers of the roots of an equation – Newton's theorem, Reciprocal Equations.

Unit III Transformation of equations, Descarte's rule of signs – Rolle's theorem

Unit IV Multiple roots, Sturm's Theorem, solving appropriate solution of equations using Newton's and Horner's method.

Unit V Biquadratic equations – solution by Ferrari's method – cubic equations – solutions by Cardon's method. Course Calendar

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2017
1-L1	Unit I Introduction of theory of equations
2-L2	Problems in Formation of equations
3- L3	Problems in Formation of equations
4-L4	Problems in Formation of equations
5-L5	Problems in Formation of equations
6-L6	Introduction to symmetric function of the roots
7-L7	Problems in symmetric function of the roots
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Problems in symmetric function of the roots
10- L9	Problems in symmetric function of the roots
11-L10	Problems in symmetric function of the roots
12-L11	Introduction to relation between roots and coefficient
13-L12	Problems in relation between roots and coefficient
14-L13	Problems in relation between roots and coefficient
15-L14	Unit II Introduction to the sum of the powers of the roots
16-L15	Problems in the sum of the powers of the roots
17- L16	Problems in the sum of the powers of the roots
18- L17	Problems in the sum of the powers of the roots
19- L18	Problems in the sum of the powers of the roots
20- L19	Problems in the sum of the powers of the roots
21- L20	Theory of equations to sum of the powers of the roots - **Allotting portion for Internal Test-I**
	Internal Test I begins on 31.07.2017
22- L21	Newton's theorem
23- IT-1	**Internal Test-I**
24- L22	Problems in the sum of the powers of the roots
25- L23	Problems in the sum of the powers of the roots
26- L24	Problems in the sum of the powers of the roots - **Test Paper distribution and result analysis**
27- L25	Problems in the sum of the powers of the roots
28- L26	Problems in the sum of the powers of the roots
29- L27	Unit III Introduction to Transformation of equations

30- P2	**College level meeting/Cell function**
31-L28	Problems in Transformation of equations
32-L29	Problems in Transformation of equations
33-L30	Problems in Transformation of equations
34- L31	Introduction to Descart's rule of signs
35- L32	Problems in Descart's rule of signs
36- L33	Problems in Descart's rule of signs
37- L34	Problems in Descart's rule of signs
38- L35	Problems in Descart's rule of signs
39- L36	Rolle's theorem
40- L37	Problems in Rolle's theorem
41- L38	Problems in Rolle's theorem
42-P3	**Department Seminar**
43- L39	Problems in Rolle's theorem
44- L40	Unit IV Definition of Multiple roots and theorem
45- L41	Problems in Multiple roots
46- L42	Problems in Multiple roots
47- L43	Sum of the powers of the roots to Multiple roots - **Allotting portion for Internal Test-II**
	Internal Test II begins on 30.08.2017
48- L44	Strum's theorem and problems
49-IT-II	**Internal Test-II**
50-L45	Problems in strum's function
51- L46	Problems in strum's function - **Test Paper distribution and result analysis**
52- L47	Problems in strum's function
53- L48	Problems in strum's function
54- L49	Problems in Newton's method
55- L50	Problems in Newton's method
56- L51	Problems in Horner's method
57- L52	Problems in Horner's method
58- L53	Unit V Biquadratic equation- Solve the problems using Ferrari's method
59-P4	**College level meeting/ function**
60- L54	Solve the problems using Ferrari's method
61- L55	Solve the problems using Ferrari's method
62- L56	Solve the problems using Ferrari's method
63- L57	Cubic equation- Solve the problems by Cardon's method
64- L58	Strum's theorem to Cardon's method- **Allotting portion for Internal Test-III**
	Internal Test III begins on 03.10.2017
65- L59	Solve the problems by Cardon's method
66- L60	Solve the problems by Cardon's method
67-IT-III	**Internal Test-III**
68- L61	Solve the problems by Cardon's method
69- L62	Solve the problems by Cardon's method
70- L63	Solve the problems by Cardon's method - **Test Paper distribution and result analysis**
	Model test begins on 19.10.2017
71-MT	**Model Test**
72-MT	**Model Test**

73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Classical Algebra"
CO1	Get the knowledge of Theory of equations
CO2	Solved the problems using the Powers of the roots of the equations
CO3	Get the knowledge of Strum's functions

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

<table>
<tr><td>Programme Name</td><td>B. Sc (Mathematics)</td></tr>
<tr><td>Course Name</td><td>Statistics-I</td></tr>
<tr><td>Course Code</td><td>SAST11</td></tr>
<tr><td>Class</td><td>I year (2017-2018)</td></tr>
<tr><td>Semester</td><td>Odd</td></tr>
<tr><td>Staff Name</td><td>1. Mrs. T. Santhakumari
2. Mr. JeshuaRajan</td></tr>
<tr><td>Credits</td><td>3</td></tr>
<tr><td>L. Hours /P. Hours</td><td>6 / WK</td></tr>
<tr><td colspan="2">Total 90 Hrs/Sem
Internal Test-3 Hrs
Model Test-4Hrs
Dept. Meetings-0Hrs
College Meetings-4Hrs
Remaining 80Hrs (5 units; 5×16=80; 16 Hrs /unit (Approximately))</td></tr>
</table>

Course Objectives

- How to calculate and apply measures of location and measures of dispersion – grouped and ungrouped data cases.
- How to calculate correlation and regression in various business problems.
- How to apply attributes to various types of problems.
- How to apply discrete and continuous probability distributions to various business problems.
- Provide a foundation and motivation for exposure to statistical ideas subsequent to the course.

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – I / Allied-1

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.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begins on 16.06.2017
1-L1	UNIT I- Introduction to moments.
2-L2	Moment’s definitions and problems.
3- L3	Moment’s problems continued.
4-L4	Introducing the concepts of skewness and kurtosis
5-L5	Introducing the concept curve fitting and problems related to fir a straight line.
6-L6	Explain about how to fit a parabola.
7-L7	Curve fitting problems continued
8-L8	Curve fitting problems continued.
9-L9	Explain about discrete random variables.
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
10-L10	Curve fitting problems and applications.
11-L11	Curve fitting problems and applications continued.
12-L12	Curve fitting problems and applications continued.

13-L13	Curve fitting problems and applications continued.
14-L14	Curve fitting problems and applications continued.
15-L15	Curve fitting problems and applications continued.
16-L16	Curve fitting problems and applications continued.
17-L17	Curve fitting problems and applications continued.
18-L18	Curve fitting problems and applications continued.
19-L19	Curve fitting problems and applications continued.
20-L20	Curve fitting problems and applications continued.
21-L21	Unit – II -Introduction on Correlation coefficents
	Internal Test I begins on 31.07.2017
23-L22	Correlation coefficents
24-L23	Correlation problems.
25-L24	Correlation problems.
26-L25	Correlation coefficients continuation.
26-IT-1	**Internal Test-I**
27-L26	Correlation problems continued.
28-L27	Correlation problems continued.
29-L28	Correlation problems continued.
30-L29	Correlation problems continued.
31-L30	Correlation problems continued.
32-L31	Correlation problems continued.- **Test Paper distribution and result analysis**
33-L32	Problems related to regression.
34-P2	**College level meeting/Cell function**
34-L33	Problems related to regression.
35-L34	Problems related to regression.
36-L35	Problems related to regression.
37-L36	Problems related to regression.
38-L37	Problems related to regression.
39-L38	Problems related to regression.
40-L39	Problems related to regression.
41-L40	Problems related to regression.
42-L41	Problems related to regression.
43-L42	Unit –III – Theory of attributes –Introduction
44-L43	Class frequency and order of class explanation.
45- L44	Class frequency and order of class explanation.
46-L45	Class frequency and order of class explanation.
47-L46	Class frequency and order of class explanation.
48-L47	Explain the concept of dichotomisation
49-L48	Problems on Attributes.
50-L49	Classes and class frequency of attributes.
52-L50	Order of classes and class frequency of attributes.
53-L51	Explain the concept consistency of data.
54-L52	Explain the concept independence of attributes and some problems.
56-L53	Explain consistency of data and problems - **Allotting portion for Internal Test-II**
	Internal Test II begins on 30.08.2017
57-L54	Explain consistency of data and problems
58-L55	Explain about condition of consistency and problems.

59-IT-II	**Internal Test-II**
59-L56	Explain consistency of data and problems
60-L57	Explain about condition of consistency and problems.
61-L58	Problems on Yule’s coefficient of association- **Test Paper distribution and result analysis.**
62-L59	Problems on Yule’s coefficient of association**.**
63-L60	Problems on Yule’s coefficient of association**.**
64-L61	Problems on Yule’s coefficient of association**.**
65-L62	UNIT IV -Introduction to statistics and Random variable.
66-L63	Definition of continuous random variables and their problems.
67-L64	Continuous random variables and their problems are continued.
68-L65	Explain about expected value of random variable and related problems.
69-L66	Problems of expected value of random variable are continued.
70-L67	Introducing the concept of moment generating function and do some problems related to moment generating function.
71-L68	Introduce the concept of cumulative generating function.
72-L69	Cummulants generating function problems.
73-L70	Cummulants generating function properties.
74-P4	**College level meeting/ function**
75-L71	Problems on cummulants generating function.
76-L72	UNIT – V Recurrence, characteristic functions.
77-L73	Recurrence, characteristic functions.
78-L74	Recurrence, characteristic functions.
79- L75	Moments about origin , mean and problems.
80 – L76	Mgf, mean and variance of poisson distribution
81-L77	Mgf, mean and variance of poisson distribution**- Allotting portion for Internal Test-III.**
	Internal Test III begins on 03.10.2017
82-IT-III	**Internal Test-III**
83 – L78	Poisson distribution problems continued.
84 –L78	Introducing the concept of normal distribution & Problems
85 –L79	Normal distribution problems **- Test Paper distribution and result analysis.**
	Model Test begins on19.10.2017
86-MT	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90- L80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course “STATISTICS–I”
CO1	Use appropriate statistical methods in the analysis of simple data sets.
CO2	Students will summarize data visually and numerically

CO3	Appreciate the importance of probability and statistics in computing and research.
CO4	Draw Scatter diagram.
CO5	Interpret and clearly present output from statistical analyses in a clear concise and understandable manner.
CO6	Application of attributesin various fields.
CO7	Demonstration an understanding of the basic concepts of probability and random variables.
CO8	Apply inferential methods relating to the means of Normal distributions.
Experimental Learning	
EL1	To categories and collect differentdata related to population for calculating moments about mean.
EL2	GD on application of correlation coefficients and rank correlation.
EL3	Collect different data for calculating Yule's coefficients of attributes.
Integrated Activity	
IA1	Prepare chart for binomial,normal and Poisson distributions.
IA2	How statistics used in day-today life.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

Forslow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B.Sc. Mathematics
Course Name	Environmental Studies
Course Code	SEVS21
Class	I year (2017-2018)
Semester	Odd
Staff Name	Mrs. T. Santhakumari
Credits	2
L. Hours /P. Hours	2 / WK
Total 30Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 20Hrs (5 units; 5×4=20; 4Hrs /unit)	

Course Objectives

- Use and over-utilization of surface and ground water
- Mineral resources: Use and exploitation
- Growing energy needs

Syllabus

UNIT I: THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Definition, scope and importance Natural resources and associated problems:Forest resources: Use and over-exploitation, deforestation, timber extraction, dams and their effects on forests and tribal people. – Water resources: Use and over-utilization of surface and ground water, floods, drought, dams-benefits and problems, water conservation and watershed management. -Mineral resources: Use and exploitation, environmental effects.-Food resources: World food problems, changes, effects of modern agriculture, fertilizer-pesticide problems. -Energy resources: Growing energy needs, renewablesndlnon renewable energy sources, alternate energy sources.- Land resources: Land as a resource, land degradation, man-induced landslides, soil erosion and desertification.

UNIT II: ECOSYSTEMS

Forest Ecosystem -Grassland Ecosystem -Desert ecosystem - Aquatic Ecosystem (Ponds, rivers, oceans, estuaries) -Energy flow in the ecosystem-Ecological succession-Food Chains, Food Webs and Ecological Pyramids.

UNIT III: BIODIVERSITY AND ITS CONSERVATION

Introduction Definition: Genetic, species and ecosystem diversity-Biogeographical classification of Jndia -Values of Biodiversity- Biodiversity at global, national and local levels- India as a mega-diversity nation- Hot-Spots of biodiversity -Threats to biodiversity - Endangered and endemic species of India -Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity**.**

UNIT IV: ENVIRONMENTAL POLLUTION

Definition- Causes, effects and control measures of:-Air Pollution -Water Pollution -Soil Pollution - Marine Pollution - Noise Pollution.- Thermal Pollution -Solid Waste Management - Disaster Management: Floods, earthquake, cyclone and landslides.

UNIT V: SOCIAL ISSUES AND THE ENVIRONMENT

Climatic change, global warming, acid rain, ozone depletion.- Wasteland reclamation - Consumerism and Waste products, use and through plastics Environment Protection Act- Air (Prevention and Control of Pollution) Act -Water (Prevention and Control of Pollution) Act - Wildlife Protection Act Forest Conservation Act -Population Explosion — Family Welfare Programme Human Rights

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2017
1-L1	**Unit-1**:Forest resources: Use and over-exploitation, deforestation, timber extraction, dams and their effects on forests and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, dams-benefits and problems, water conservation and watershed management.
2-L2	Energy resources: Growing energy needs, renewablesndlnon renewable energy sources, alternate energy sources-
3- P1	**Welcoming of First year and Inauguration of BCA Association**
4-L3	Mineral resources: Use and exploitation, environmental effects.
5-L4	Land resources: Land as a resource, land degradation, - **Allotting portion for**

	Internal Test-I
	Internal Test I begins on 31.07.2017
6-IT-I	**Internal Test-I**
7-L5	man-induced landslides, soil erosion and desertification - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
8-L6	Food resources: World food problems, changes, effects of modern agriculture, fertilizer-pesticide problems**.**
9-L7	Unit-2: Forest Ecosystem -Grassland Ecosystem -Desert ecosystem - Aquatic Ecosystem (Ponds, rivers, oceans, estuaries)
10-P2	**College level meeting/Cell function**
11-L8	Energy flow in the ecosystem-Ecological succession-Food Chains, Food Webs and Ecological Pyramids.
12-L9	Unit-3: Introduction Definition: Genetic, species and ecosystem diversity-Biogeographical classification of Jndia -Values of Biodiversity- Biodiversity at global, national and local levels
13-P3	**Department Seminar**
14-L10	India as a mega-diversity nation- Hot-Spots of biodiversity -Threats to biodiversity -Endangered and endemic species of India -Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity**.**
15-L11	Unit-4: Definition- Causes, effects and control measures of:- -
16-L12	Water Pollution -Soil Pollution - Marine Pollution- **Allotting portion for Internal Test-II**
	Internal Test II begins on 30.08.2017
17-IT-1	**Internal Test-II**
18-L13	Air Pollution - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
19-L14	Noise Pollution.- Thermal Pollution -Solid Waste Management - Disaster Management: Floods, earthquake, cyclone and landslides.
20- P2	**College level meeting/ function**
21-L15	Unit-5: Climatic change, global warming, acid rain, ozone depletion.- Wasteland reclamation -Consumerism and Waste products, use and through plastics Environment Protection Act
22-L16	Air (Prevention and Control of Pollution) Act -Water (Prevention and Control of Pollution) Act
23- L17	Wildlife Protection Act Forest Conservation Act - **Allotting portion for Internal Test-III**
	Internal Test III begins on 03.10.2017
24- IT-III	**Internal Test-III**
25-L18	Population Explosion — Family Welfare Programme Human Rights- **Test Paper distribution and result analysis**
	Model Test begins on 19.10.2017
	Entering Internal Test-III Marks into University portal
26-MT	**Model Test**
27-MT	**Model Test**
28-MT	**Model Test**
29-L19	**Model test paper distribution and previous year university question paper discussion**
30-L20	**Feedback of the Course, analysis and report preparation**

	Last Working day on 19.10.2017

Course Outcomes

Learning Outcomes	
CO1	Energy flow in the ecosystem-Ecological succession-Food Chains, Food Webs and Ecological Pyramids
CO2	Noise Pollution.- Thermal Pollution -Solid Waste Management - Disaster Management: Floods, earthquake, cyclone and landslides
CO3	Climatic change, global warming, acid rain, ozone depletion.- Wasteland reclamation
Experimental Learning	
EL1	Soil Pollution
EL2	Disaster Management
Integrated Activity	
IA1	Field Work
IA2	Village Visit

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Mathematics for Competitive Examinations-I
Course Code	SNMA3A
Class	II year (2017-2018)
Semester	Odd
Staff Name	Mrs. T. Santhakumari
Credits	2
L. Hours /P. Hours	2 / WK
Total 30Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 20 Hrs (5 units; 5×4=20; 4Hrs /unit)	

Course Objectives

- To learn the problems solving techniques for aptitude problems
- To enable the students prepare themselves for various competitive examinations

Syllabus

Non – Major Elective Paper – I
Mathematics for Competitive Examinations -I (30 Hours) (SNMA3A)

Unit I

Simplifications, averages 7L

Unit II

Ratio and proportion 5L

Unit III

	Partnership – Percentage	5L
Unit IV		
	Profit and Loss	6L
Unit V		
	Problems on numbers	7L

Text Book:

Objective Arithmetic – R.S. Aggarwal – S.Chand & Co

Books for Reference :

- Quantitative Aptitude for Competitive examinations – Abhijit Guha – TMH
- Mathematics for life – M. Immaculate – Nanjil offset Printers

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16.06.2017
1-L1	Unit I – Simplifications – the rule 'BODMAS'
2-L2	Simple problems using BODMAS
3- P1	**Welcoming of First year and Inauguration of DepartmentAssociation**
4-L3	Averages – Problem discussion
5-L4	Problems on Averages –**Allotting portion for Internal Test-I**
	Internal Test I begins (31.07.2017)
6-IT-I	**Internal Test-I**
7-L5	Unit II – Ratio: basic resultsand problems - **Test Paper distribution and result analysis**
8-L6	Proportion: means, extremes - Problems
9-L7	Problems on ratio and proportion
10-P2	**College level meeting/Cell function**
11-L8	Unit III – Results on Partnership and some problems
12-L9	Problems on Partnership
13-P3	**Department Seminar**
14-L10	Percentage calculation
15-L11	Problems using Percentage
16-L12	Unit IV –Profit and Loss - **Allotting portion for Internal Test-II**
	Internal Test II begins (30.08.2018)
17-IT-1	**Internal Test-II**
18-L13	Celling price, cost price, Gain and loss calculating method –**Test Paper distribution and result analysis**

19-L14	Problems for profit and loss calculations
20- P2	**College level meeting/ function**
21-L15	Unit V –Problems on numbers
22-L16	Problems to finding numbers using its ratio
23- L17	Problems to finding numbers using its sum and products - **Allotting portion for Internal Test-III**
	Internal Test III begins (03.10.2017)
24- IT-III	**Internal Test-III**
25-L18	Problems on numbers –**Test Paper distribution and result analysis**
	Model Test begins (19.10.2017)
26-MT	**Model Test**
27-MT	**Model Test**
28-MT	**Model Test**
29-L19	**Model test paper distribution and previous year university question paper discussion**
30-L20	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Mathematics for Competitive Examinations-I"
CO1	After studying this course, students can able to solve problems using BODMAS
CO2	deal problems on numbers
CO3	do problems using ratio and proportion
CO4	calculate profit or loss in any scenario
Experimental Learning	
EL1	Solve previously asked questions in RRB exams and Bank exams.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Analytical Geometry Of Three Dimensions
Course Code	SMMA21
Class	I year (2018-2019)
Semester	Even
Staff Name	Mr. Jeshua Rajan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To describe the objects in three dimensions using coordinate system
- To gain some knowledge about planes in a space
- To know about lines and its properties
- Understanding the structure of spheres and intersections of known objects
- To express cones and cylinder using mathematical equations

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Core-3

ANALYTICAL GEOMETRY OF THREE DIMENSIONS: (75 Hours)

Unit I Analytical Geometry of 3D Co-ordinate system, direction cosines, direction ratios

Unit II Equation of plane in different forms - angle between planes-Length of perpendicular-angle bisection.

Unit III - Equation of a line in different forms - image of a point – image of a line-The plane and the straight line-angle between plane and line-Coplanar lines-Shortest distance between two lines

Unit IV Sphere – Tangent plane – circle of intersections – Tangency of Spheres – coaxial system of spheres - Radical Planes – Orthogonal Spheres.

Unit V Equation of a cone-cone with vertex at the orgin –Tangent plane and normal-Quadratic cone with the vertex at orgin – Right circular cone – Cylinder – Right circular cylinder-enveloping cylinder

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03.12.2018
1-L1	Unit I – Introduction to co-ordinate systems in three dimensions and distance between two points
2-L2	Finding the point dividing the line joining two points in some fixed ratio
3- L3	The centroid of a triangle using vertices in three dimensions
4-L4	Problem discussions in coordinate systems
5-L5	Problems to check the properties of given objects using coordinates and distance formula
6-L6	Projection of any three dimensions object into a two dimension plane; particularly, projection of a finite line on another straight line
7-L7	Direction cosines and direction ratios
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Relation between direction cosines and direction ratios and problem discussions
10- L9	Direction cosines of the line joining two points
11-L10	Angle between two lines whose direction cosines are given
12-L11	Conditions for perpendicularity and parallelism
13-L12	Problem discussions to verify parallel and perpendicular conditions using direction cosines

14-L13	Direction cosines of the angle bisectors
15-L14	Unit II – The general equation of the first degree in x,y,z represents a plane
16-L15	Normal form and intercept form of the equation of the plane
17- L16	Three points form of the equation of the plane; problem solving to find the equation of a plane passing through three given points
18- L17	Direction cosines of the line that is perpendicular to a plane
19- L18	Angle between two given planes
20- L19	Problems to finding the equation of planes using points on it and perpendicularity and parallelism of lines to it
21- L20	The ratio in which a plane divides the line joining the two given points – **Allotting portion for Internal Test-I**
	Internal Test I begins (18.01.2019)
22- L21	Equation of a plane through the line of intersection of two given planes
23- IT-1	**Internal Test-I**
24- L22	Problem discussion to finding plane equations using some given conditions
25- L23	Length of perpendicular from a point to the given plane
26- L24	Problem discussions – **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Finding the equation of the plane bisecting the angle between two given planes
28- L26	Finding the equation of reflection of the plane in a given plane
29- L27	Unit III – Derivation of equation of a line using intersection of two given planes
30- P2	**College level meeting/Cell function**
31-L28	Symmetrical form of the equations of a line
32-L29	Finding the symmetrical form of the equations of the given line of intersection of the planes
33-L30	Equation of a straight line passing through two given points
34- L31	Finding the perpendicular distance from a point to a line (given in symmetrical form)
35- L32	Finding the perpendicular distance from a point to a lineof intersection of the planes
36- L33	Finding the image of a point in a given plane
37- L34	Finding the image of the line in a given plane
38- L35	The line and the plane – The condition for the line to be parallel to the plane
39- L36	Finding the orthogonal projection of the line on the plane
40- L37	Angle between the plane and the line; deducing the parallel condition
41- L38	Coplanar lines – Condition for the coplanarity
42-P3	**Department Seminar**
43- L39	The shortest distance between two given lines
44- L40	Unit IV – The general equation of a sphere and finding its centre and radius
45- L41	The length of the tangent from the point to the given sphere
46- L42	The plane section of a sphere is a circle
47- L43	Equation of a sphere passing through a given circle –**Allotting portion for Internal Test-II**
	Internal Test II begins (25.02.2019)
48- L44	Derivation of the equation of the tangent plane to the sphere at a point
49-IT-II	**Internal Test-II**
50-L45	Problem discussion to finding the tangent plane by the given conditions
51- L46	The equation to the circumcircle of the triangle that made by intersection of sphere and a plane – **Test Paper distribution and result analysis**

	Entering Internal Test-II Marks into University portal
52- L47	The condition that a line should touch the given sphere represented in general form
53- L48	The equation of the sphere passing through a circle that touches a plane
54- L49	Finding the point of contact between a plane and a sphere
55- L50	Problem discussion to on sphere related to some planes
56- L51	Unit V – The Cone; Definition of right circular cone, the vertex, the axis and the semi vertical angle.
57- L52	The condition for the equation F(x,y,z)=0 to represent a cone
58- L53	The condition for the equation F(x,y,z)=0 to represent a right circular cone
59-P4	**College level meeting/ function**
60- L54	Intersection of a straight line and a quadratic cone
61- L55	The tangent plane and normal to the cone
62- L56	Obtaining the condition for the plane to touch the quadric cone
63- L57	Reciprocal cones of a given cone using locus of the normal
64- L58	The angle between the lines in which the plane cuts the cone – **Allotting portion for Internal Test-III**
	Internal Test III begins (22.03.2019)
65- L59	Cylinder – its equation using generators and guiding curves
66- L60	The equation of the right circular cylinder with given axis and given radius of the guiding circle
67-IT-III	**Internal Test-III**
68- L61	The equation of the right circular cylinder described on the circle through the points on coordinate axes as a guiding curve
69- L62	The enveloping cylinder of the surface having the generator parallel to a line passing through origin
70- L63	Problem discussion for Revision - **Test Paper distribution and result analysis**
	Model Test begins (08.04.2019)
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Analytical Geometry Of Three Dimensions"
CO1	Understand the objects in three dimensions using coordinate system
CO2	Difference between directional cosines and directional ratios
CO3	Able to solve problems on finding plane equations using given criteria
CO4	Explain all the forms of lines
CO5	Angle between planes – lines – plane and lines

CO6	Understand the structure of spheres and intersections of known objects
CO7	Describe the shapes by intersection of some combination of spheres, planes and lines
CO8	Expressions of the equations of cones, cylinder, right circular cones and right circular cylinder
Experimental Learning	
EL1	Discussions on cubes and cuboids using modelling
EL2	Making three dimensional understanding techniques using natural existing things
EL3	Collecting some graphs that represent the several types of sections of plane and cylinders
Integrated Activity	
IA1	To do modelling to express the intersection of plane and sphere
IA2	Make three dimensional objects such as, dodecahedral, cuboids, tetrahedral, etc.,

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Differential Equations
Course Code	SMMA22
Class	I year (2018-2019)
Semester	Even
Staff Name	S. John Augastine
Credits	5
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Identify the type of a given differential equations and select and apply the appropriate analytical technique for finding the solution of first order abd selected higher order ODE
- Evaluate first order differential equations including separable, homogeneous, exact and linear.
- Solve linear systems of ordinary differential equations
- Solve differential equations using variation of parameters.

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Core - 4

DIFFERENTIAL EQUATIONS : (75 Hours)

Unit I First order higher degree equations – solvable for x,y,p and Clairaut's form – Simultaneous differential equations of the form f1(D)x+ g1(D)y = h1(t), f2(D) x + g2(D)y = h2(t)

Unit II (Ordinary differential equation) Second order linear differential equations with constant coefficients – Find the P.I for functions of the form eax f(x) and xnf(x)

Unit III Linear equations of second order with variable coefficients – Homogeneous equations – Equation reducible to homogeneous equation.

Unit IV (Partial differential equations) Formation of equations by elimination of arbitrary constants and functions – Definition of general, particular and complete solutions – solving standard forms f(p,q) = 0, f(x, p, q) = 0, f(y, p, q) = 0, f(z, p, q) = 0, f(x, p) = f(y, q), z = px + qy + f(p,q) – Lagrange's differential equations Pp + Qq = R

Unit V Application of differential equations – Growth and Decay – chemical reaction - Newton's law of cooling – Brochistocrone problem – simple electric circuits.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begins on 03.12.2018
1-L1	UNIT I:First Order Higher Degree Equations– Introduction
2-L2	Equations solvable for dy/dx
3- L3	Problems on equations solvable for dy/dx
4-L4	Equations solvable for y
5-L5	Equations solvable for x
6-L6	Problems on Equations solvable for x and y
7-L7	Clairaut's form
8- P1	**Welcoming of First year and Inauguration of MathematicsAssociation**
9- L8	Problems on Clairaut's form
10- L9	Equationsthatdonotcontain x explicitly
11-L10	Equationsthatdonotcontain y explicitly
12-L11	Simultaneous differential equations
13-L12	Problems on Simultaneous differential equations

14-L13	Simultaneous differential equations with variable coefficients
15-L14	UNIT II :ORDINARY DIFFERENTIAL EQUATION - Inroduction
16-L15	Definitions of linear equations
17- L16	Second order linear differential equations with constant coefficients
18- L17	The operator D
19- L18	Complementary function of a linear equation with constant coefficients
20- L19	Problems on Complementary function of a linear equation with constant coefficients
21- L20	Particular integral - **Allotting portion for Internal Test-I**
	Internal Test I begins on 18.01.2019
22- L21	General method of finding P.I
23- IT-1	**Internal Test-I**
24- L22	Special methods of finding Particular integral
25- L23	Problems on RHS = e^{ax}
26- L24	Problems on RHS = sinax -**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Problems on RHS = x^n
28- L26	Find the P.I for functions of the form $e^{ax}f(x)$ and $x^n f(x)$
29- L27	UNITIIILINEAR EQUATIONS OF SECOND ORDER WITH VARIABLE COEFFICIENTS– Introduction
30- P2	**College level meeting/Cell function**
31-L28	Problems on linear equations with variable coefficients
32-L29	Problems on by putting $z = \log x$
33-L30	Problems on finding the particular integral
34- L31	Special method of evaluating the P.I when X is of the form x^m
35- L32	Problems on without transforming with constant coefficients
36- L33	Homogeneous equations
37- L34	Problems on Homogeneous equations
38- L35	Equations reducible to the linear equations
39- L36	Problems on equations reducible to the linear equations
40- L37	Problems on equations reducible to the linear equations
41- L38	Equations reducible to the linear equations by means of the substitution
42-P3	**Department Seminar**
43- L39	Problems on Equations reducible to the linear equations by means of the substitution
44- L40	UNIT IV : PARTIAL DIFFERENTIAL EQUATIONS – Introduction
45- L41	Partial Differential Equations of the first order
46- L42	Classification of integrals
47- L43	Singular integral - **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
48- L44	General integral
49-IT-II	**Internal Test-II**
50-L45	Particular integral
51- L46	Derivation of partial differential equations -**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Problems on General integral, Singular integral and Particular integral
53- L48	Elimination of constants

54- L49	Problems on Elimination of constants
55- L50	Elimination of an arbitrary function
56- L51	solving standard forms f(p,q) = 0, f(x, p, q) = 0, f(y, p, q) = 0, f(z, p, q) = 0, f(x, p) = f(y, q), z = px + qy + f(p,q)
57- L52	Lagrange's differential equations Pp + Qq = R
58- L53	UNIT V : APPLICATION OF DIFFERENTIAL EQUATIONS - Introduction
59-P4	**College level meeting/ function**
60- L54	Problems on application of differential equations
61- L55	Definitions of growth and decay
62- L56	Problems on growth and decay
63- L57	Definitions of Chemical reaction
64- L58	Problems onChemical reaction - **Allotting portion for Internal Test-III**
	Internal Test III begins on 22.03.2019
65- L59	Definitions of Newton's law of cooling
66- L60	Problems onNewton's law of cooling
67-IT-III	**Internal Test-III**
68- L61	Explanation of Brochistocrone problem
69- L62	Simple electric circuits
70- L63	Problems on Simple electric circuits - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 08.04.2019
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Differential Equations"
CO1	Solve first order differential equations utilizing the standard techniques for separable ,exact, linear , homogeneous or Bernoulli cases
CO2	Find the particular solution when given initial or boundary conditions
CO3	Solve higher order linear differential equations using reduction of order, undetermined coefficients or variation of parameters
CO4	Solve the first and higher order linear equations with constant and variable coefficients
CO5	Able to understand the application of ordinary differential equation.
Integrated Activity	
IA1	Application of ordinary differential equation in day today life
IA2	To know about the solution of first and higher order differential

	equation with constant and variable coefficients

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Statistics- II
Course Code	SAST21
Class	I year (2018-2019)
Semester	Even
Staff Name	1. Mr. T. Santhakumari 2. Mr. S. John Augastine
Credits	3
L. Hours /P. Hours	6 / WK
Total 90Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To know the concept of index numbers
- To study the distribution functions
- To understand the Analysis of variance

Syllabus

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – II / Allied –II

Statistics (For Mathematics Students) Paper – II (90 Hours)

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 varience – 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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03.12.2018
1-L1	Index. Number Introduction
2-L2	Unweighted or Simple Index Number
3- L3	Problems
4-L4	Average of Price Relative Method
5-L5	Problem (A.M. & G.M.)
6-L6	Fixed and Chain Base Method
7-L7	Weighted Index Number
8-L8	Problems
9-L9	Ideal Index Number – 3Tests
10-P1	**Welcoming of First year and Inauguration of MathematicsAssociation**
11-L10	Some Results
12-L11	Finding the missing price
13-L12	Cost of living Index Number
14-L13	Problems
15-L14	Uses of index numbers

16-L15	Test – Circular Test
17-L16	**Time reversal test, Unit Test**
18-L17	Testing of Hypothesis
19-L18	Null and Alternating Hypothesis
20-L19	Type I, Type II errors
21-L20	Critical region, Level of Significance
22-L21	Large Samples
23-L22	Problems discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins on 18.01.2019
24-L23	Difference in Proportion
25-L24	Problems
26-IT-1	**Internal Test-I**
27-L25	Single mean
28-L26	Problems
29-L27	Difference of means
30-L28	Problems discussion -**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Problems
32- L30	Derive some Formulae
33- L31	Problems
34-P2	**College level meeting/Cell function**
35- L32	Revision
36- L33	Introduction to different Distribution Tests
37- L34	Test based on χ^2Distribution
38- L35	Problems on χ^2Distribution
39- L36	Exercise Problems
40- L37	Test for Independence of Attributes
41- L38	Theorem - χ^2Test of Independence
42- L39	Yate's Corrrection
43- L40	Small Samples
44- L41	Problems on Small Samples
45- L42	t-distribution
46- L43	Goodness of Fit
47- L44	Confident Limits
48- L45	Problems on t-distribution
49- L46	Problems on t-distribution
50- L47	F-Test
51- P3	**Department Seminar**
52- L48	Problems on F-Test
53- L49	Test based on χ^2Distribution
54- L50	χ^2Test for Population Variance
55- L51	Introduction to Analysis of Variance
56-L52	One Way Classification - **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
57-L53	Example Problems
58-L54	Exercise Problems
59-IT-II	**Internal Test-II**
60- L55	Two Way Classification

61- L56	Example Problems-**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Example Problems
63- L58	Exercise Problems
64- L59	Basis of Experimental Design
65- L60	Randomized Block Design
66- L61	Latin Square
67- L62	Example Problems on Latin Square
68- L63	Introduction to SQC
69- L64	SQC
70- L65	Definitions and Examples
71- L66	Advantages and Problems
72- L67	Process Control
73- L68	Control Chart, Examples
74-P4	**College level meeting/ function**
75- L69	Mean Chart - Example
76- L70	Range Chart - Example
77- L71	P Chart - Example
78- L72	Product Control
79- L73	Problems on control charts - **Allotting portion for Internal Test-III**
	Internal Test III begins on 22.03.2019
80- L74	Problems
81- L75	Sampling Inspection
82-IT-III	**Internal Test-III**
83- L76	Problems
84- L77	Problems on control charts - **Test Paper distribution and result analysis**
85- L78	Problems on control charts
	Entering Internal Test-III Marks into University portal
	Model test begins on 08.04.2019
86-MT	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89- L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "StatisticsPaper - II"
CO1	To analyse the ideas in index number and its applications
CO2	Identify the characteristics of different discrete and continuous distributions.
CO3	To gain the knowledge about different Distribution Tests, such as, the t, F and χ^2 distributions and their applications

CO4	Able to study an introduction to Analysis of Variance, and one / two way classification methods
CO5	Able to understand the process chart and control charts, particularly, mean chart, range chart and P-chart.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Value Based Education
Course Code	SNMA3A
Class	I year (2018-2019)
Semester	Even
Staff Name	Mr. C. Prabhu Daniel Packiyanathan
Credits	2
L. Hours /P. Hours	2 / WK
Total 30Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 20 Hrs (5 units; 5×4=20; 4Hrs /unit)	

Course Objectives

To enable the students to understand the social realities and to inculcate an essential value system towards building a health society

Syllabus

Unit I: Social Justice Definition – need – parameters of social justice – factors responsible for social injustice – caste and gender – contributions of social reformers.

Unit II : Human Rights and Marginalized People Concept of Human Rights – Principles of human rights – human rights and Indian constitution – Rights of Women and children – violence against women – Rights of marginalized People – like women, children, dalits, minorities, physically challenged etc

Unit III: Social Issues and Communal Harmony Social issues – causes and magnitude - alcoholism, drug addiction, poverty, unemployment etc – communal harmany –concept – religion and its place in public in public domain – separation of religion from politics – secularism role of civil society

Unit IV: Media Education and Globalized World Scenario Mass media –functions – characteristics –need and purpose of media literacy – effects and influence - - youth and children – media power – socio cultural and political consequences mass mediated culture - - consumeristic culture – Globalization – new media- prospects and challenges

Unit V: Values and Ethics Personal values – family values – social values – cultural values – Professional values – and overall ethics – duties and responsibilities

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03.12.2018
1-L1	Unit I: Social Justice Definition – need
2-L2	Parameters of social justice
3- P1	**Welcoming of First year and Inauguration of Department Association**
4-L3	Factors responsible for social injustice – caste and gender
5-L4	Contributions of social reformers–**Allotting portion for Internal Test-I**
	Internal Test I begins on 18.01.2019
6-IT-I	**Internal Test-I**
7-L5	Unit II : Concept of Human Rights – Principles of human rights – human rights and Indian constitution – **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
8-L6	Rights of Women and children – violence against women
9-L7	Rights of marginalized People – like women, children, dalits, minorities, physically challenged etc
10-P2	**College level meeting/Cell function**
11-L8	Unit III: Social Issues and Communal Harmony - Social issues – causes and magnitude
12-L9	Alcoholism, drug addiction, poverty, unemployment etc
13-P3	**Department Seminar**
14-L10	Communal harmany –concept –religion and its place in public in public domain
15-L11	Separation of religion from politics –secularism role of civil society
16-L12	Unit IV: Media Education and Globalized World Scenario – Mass media – functions –characteristics –need and purpose of media literacy – effects and influence –**Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
17-IT-1	**Internal Test-II**
18-L13	Youth and children – media power – socio cultural and political consequences mass mediated culture - consumeristic culture –**Test Paper distribution and**

	result analysis
	Entering Internal Test-II Marks into University portal
19-L14	Globalization – new media- prospects and challenges
20- P2	**College level meeting/ function**
21-L15	**Unit V: Values and Ethics** Personal values – family values
22-L16	Social values – cultural values
23- L17	Professional values – and overall ethics**- Allotting portion for Internal Test-III**
	Internal Test III beginson 22.03.2019
24- IT-III	**Internal Test-III**
25-L18	Duties and responsibilities–**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 08.4.2019
26-MT	**Model Test**
27-MT	**Model Test**
28-MT	**Model Test**
29-L19	**Model test paper distribution and previous year university question paper discussion**
30-L20	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Value Based Education"
CO1	Able to understand the social realities
CO2	Enable the students to inculcate an essential value system towards building a health society
CO3	To understand about the social issues and communal harmony in public domain
CO4	To gain the knowledge in Mass media functions, its characteristics and its power
CO5	To know the Globalized world scenario
CO6	To discuss the personal, family, social and cultural values and its ethics

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc. Mathematics
Course Name	Abstract Algebra
Course Code	SMMA41
Class	II year (2018-2019)
Semester	Even
Staff Name	Mrs.P.Gino Metilda
Credits	6
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the concept of Groups ,Ring and Field.
- To study the concept of homomorphism

CORE PAPER – VI

ABSTRACT ALGEBRA-I (90 Hours) (SSMA41)

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. **18L**

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 **16L**

Unit III Normal subgroups : Quotient groups – Group Homomorphis – Canonical homomorphism – kernel of a homomorphism – Isomorphism – Automorphism – Inner automorphism – Permutation groups – Cayley‟s theorem. **20L**

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. **18L**

Unit V Homomorphism of rings – Isomorphism – kernel of a homomorphism – Fundamental theorem – Field of quotients of an integral domain – polynomial rings – Division algorithm **18L**

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03-12-2018
1-L1	Unit I Introduction on Group and definition of a Group
2-L2	Examples for group
3- L3	Examples for group
4-L4	Examples for group
5-L5	Examples for group
6-L6	Definition of subgroups with examples
7-L7	Theorems in Subgroups
8-L8	Theorems in Subgroups
9-L9	Theorems in Subgroups
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Problems in Subgroups
12-L11	Problems in Subgroups
13-L12	Problems in Subgroups
14-L13	Definition of Order of an element and examples
15-L14	Theorems in Order of an element and examples
16-L15	Theorems in Order of an element and examples
17-L16	Theorems in Order of an element and examples
18-L17	Unit II Definition of Cyclic group with examples
19-L18	Theorems in Cyclic group
20-L19	Theorems in Cyclic group
21-L20	Problems in Cyclic group
22-L21	Problems in Cyclic group
23-L22	Group to Cyclic group - **Allotting portion for Internal Test-I**
	Internal Test I begins on 18.01.2019
24-L23	Definition of Cosets and examples
25-L24	Theorems in Cosets

26-IT-1	**Internal Test-I**
27-L25	Theorems in Cosets
28-L26	Theorems in Cosets
29-L27	Lagranges theorem
30-L28	Euler's theorem- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Fermat's theorem
32- L30	Problems in Cosets
33- L31	Problems in Cosets
34-P2	**College level meeting/Cell function**
35- L32	Problems using Lagranges theorem, Euler's theorem and Fermat's theorem
36- L33	Unit III Definition of normal group and examples
37- L34	Theorems in normal subgroup
38- L35	Theorems in normal subgroup
39- L36	Problems in normal subgroup
40- L37	Problems in normal subgroup
41- L38	Definition of Isomorphism with examples
42- L39	Theorems in Isomorphism
43- L40	Theorems in Isomorphism
44- L41	Theorems in Isomorphism
45- L42	Cayley's theorem
46- L43	Problems in Isomorphism
47- L44	Problems in Isomorphism
48- L45	Problems in Isomorphism
49- L46	Definition of homomorphism with examples
50- L47	Fundamental theorem of homomorphism
51- P3	**Department Seminar**
52- L48	Problems in homomorphism
53- L49	Unit IV Definition of Rings and examples
54- L50	Theorems in rings
55- L51	Elementary property of rings
56-L52	Coset to homomorphism- **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
57-L53	Theorems in rings
58-L54	Theorems in rings
59-IT-II	**Internal Test-II**
60- L55	Problems in rings
61- L56	Problems in rings- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Problems in rings
63- L58	Types of rings
64- L59	Theorems in types of rings
65- L60	Theorems in types of rings
66- L61	Theorems in types of rings
67- L62	Definition of Integral domain and theorems in Integral domain
68- L63	Theorems in Integral domain
69- L64	Theorems in Integral domain
70- L65	Problems in Integral domain

71- L66	Unit V Definition of Ideals, Maximal Ideal and Prime Ideal
72- L67	Theorems in Ideals, Maximal Ideal and Prime Ideal
73- L68	Theorems in Ideals, Maximal Ideal and Prime Ideal
74-P4	**College level meeting/ function**
75- L69	Theorems in Ideals, Maximal Ideal and Prime Ideal
76- L70	Theorems in Ideals, Maximal Ideal and Prime Ideal
77- L71	Definition of field of quotient of rings with examples
78- L72	Theorems in field of quotient of rings with examples
79- L73	Rings to Ideals- **Allotting portion for Internal Test-III**
	Internal Test III begins on 22.03.2019
80- L74	Theorems in field of quotient of rings with examples
81- L75	Theorems in field of quotient of rings with examples
82-IT-III	**Internal Test-III**
83- L76	Definition of Polynomial rings with examples
84- L77	Examples of Polynomial rings - **Test Paper distribution and result analysis**
85- L78	Division algorithm theorem
	Entering Internal Test-III Marks into University portal
	Model test begins on 08.04.2019
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course "Abstract Algebra"
CO1	Gain knowledge about groups
CO2	Understand the properties of Groups
CO3	Solving the problems in Groups
CO4	Gain knowledge about Rings
CO5	Understand the properties of Rings
CO6	Solving the problems in Rings

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Trigonometry, Laplace Transforms And Fourier Series
Course Code	SSMA4A
Class	II year (2018-2019)
Semester	Even
Staff Name	Mr. R. Arul Ananthan
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To understand the concept of Trigonometry
- To know the concept of Laplace transform
- To study the concept of Fourier series

Skill Based Core

Paper – II

TRIGONOMETRY, LAPLACE TRANSFORMS AND FOURIER SERIES (60 Hours) (SSMA4A)

Unit I Trigonometry : Expansions of sin nx, cos nx, tan nx and expansions of $\sin^n x$ & $\cos^n x$. **10L**

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. **13L**

Unit III Laplace Transforms – Inverse Laplace Transforms. **13L**

Unit IV Solving linear differential equations with constant coefficients and simultaneous equations using Laplace Transforms. **12L**

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. **12L**

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2018
1-L1	Unit –I Introduction to Trigonometry and Expansions of sin nx
2-L2	Expansions of sin nx
3- L3	Expansions of sin nx
4-L4	Expansions of cos nx
5-L5	Expansions of cos nx
6-L6	Expansions of cos nx
7-L7	Expansions of tan nx
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Expansions of $\sin^n x$
10- L9	Expansions of $\sin^n x$
11-L10	expansions of $\cos^n x$
12-L11	Unit – II Derivation of Hyperbolic functions
13-L12	Relations between hyperbolic functions and circular functions
14-L13	Relations between hyperbolic functions and circular functions
15-L14	Relations between hyperbolic functions and circular functions - **Allotting portion for Internal Test-I**
	Internal Test I begins on 18.01.2019
16-L15	Inverse hyperbolic functions Derivation
17-IT-1	**Internal Test-I**
18-L16	Inverse hyperbolic functions Derivation

19-L17	Definition and Problems on Logarithm of Complex number - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Summation of series by C + iS method.
21- L19	Summation of series by C + iS method.
22- P2	**College level meeting/Cell function**
23-L20	Summation of series by C + iS method.
24-L21	Unit – III Introduction to Laplace transforms
25-L22	Results on Laplace Transforms
26-L23	Results on Laplace Transforms
27-L24	Problems on Laplace Transforms
28-L25	Problems on Laplace Transforms
29-L26	Introduction to Inverse Laplace transforms
30-L27	Results on Inverse Laplace Transforms
31-L28	Problems on Inverse Laplace Transforms
32-L29	Problems on Inverse Laplace Transforms
33-L30	Problems on Inverse Laplace Transforms
34- P3	**Department Seminar**
35-L31	Unit –IV Solving linear differential equations with constant coefficients
36-L32	Solving linear differential equations with constant coefficients- **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
37- L33	Solving linear differential equations with constant coefficients
38- IT-II	**Internal Test-II**
39-L34	Solving linear differential equations with constant coefficients
40-L35	Solving linear differential equations with constant coefficients - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Solving simultaneous differential equations
42- L37	Solving simultaneous differential equations
43- L38	Solving simultaneous differential equations
44- P4	**College level meeting/ function**
45-L39	Solving simultaneous differential equations
46-L40	Solving simultaneous differential equations
47-L41	Unit – V- Fourier Series – Definition
48-L42	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
49-L43	Finding Fourier coefficients for a given periodic function with period 2π and $2l$
50-L44	Finding Fourier coefficients for a given periodic function with period 2π and $2l$ - **Allotting portion for Internal Test-III**
	Internal Test III begins on 22.03.2019
51 L45	Problems on Odd and even functions
52- L46	Problems on Odd and even functions
53-IT-III	**Internal Test-III**
54-L47	Problems on Odd and even functions
55-L48	Problems on Odd and even functions - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test begins on 08.04.2019**

57-MT	**Model Test**
58-MT	**Model Test**
59- L49	Problems on Half range series-**Model test paper distribution and previous year university question paper discussion**
60-L50	Problems on Half range series-**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course "Trigonometry, Laplace Transforms And Fourier Series"
CO1	Enable the students to understand the concept of Trigonometry
CO2	Gaining knowledge on the concept of Laplace transform
CO3	Learners will know about the concept of Fourier series

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Mathematics for Competitive ExaminationsII
Course Code	SNMA4A
Class	II year (2018-2019)
Semester	Even
Staff Name	C.Prabu Daniel Pakkianathan
Credits	2
L. Hours /P. Hours	2 / WK
Total 30Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 20 Hrs (5 units; 5×4=20; 4Hrs /unit)	

Course Objectives

- To learn the problems solving techniques for aptitude problems
- To enable the students prepare themselves for various competitive examinations

Non – Major Elective Paper – II

Mathematics for Competitive Examinations -II (30 Hours) (SNMA4A)

Unit I Simple Interest – Compound interest **6L**

Unit II Time and work **7L**

Unit III Time and distance **7L**

Unit IV Chain Rule **5L**

Unit V Pipes and Cistern **5L**

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03.12.2018
1-L1	Introduction about Simple Interest and formulae
2-L2	Find the simple interest problems discussed
3- P1	**Welcoming of First year and Inauguration of MathematicsAssociation**
4-L3	Introduction about Compound Interest
5-L4	formulae and workout examples - **Allotting portion for Internal Test-I**
	Internal Test I begins on 18.01.2019
6-IT-I	**Internal Test-I**
7-L5	workout examples **-Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
8-L6	Introduction about time and work and workout examples
9-L7	Solved examples and workout exercise problems
10-P2	**College level meeting/Cell function**
11-L8	Introduction about time and distance and workout examples
12-L9	Solved examples and workout exercise problems
13-P3	**Department Seminar**
14-L10	Introduction about chain rule and workout examples
15-L11	Solved examples and workout exercise problems
16-L12	workout examples - **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
17-IT-1	**Internal Test-II**
18-L13	workout examples **-Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
19-L14	Introduction about pipes and cistern and workout examples
20- P2	**College level meeting/ function**
21-L15	Solved examples and workout exercise problems
22-L16	Semester Model questions discusse
23- L17	Semester Model questions discusse- **Allotting portion for Internal Test-III**

	Internal Test III begins on 22.03.2019
24- IT-III	**Internal Test-III**
25-L18	Semester Model questions discusse- **Test Paper distribution and result analysis**
	Model Test begins on 08.04.2019
	Entering Internal Test-III Marks into University portal
26-MT	**Model Test**
27-MT	**Model Test**
28-MT	**Model Test**
29-L19	**Model test paper distribution and previous year university question paper discussion**
30-L20	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2020

Course Outcomes

Learning Outcomes	**COs** of the course “Mathematics for Competitive Examinations -II”
CO1	Students can able to solve simple interest and compound interest in Tnpsc examinations
CO2	calculate time and distance
CO3	Calculate time and work

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Calculus
Course Code	SMMA11
Class	I year (2018-2019)
Semester	Odd
Staff Name	Mrs. T. Santhakumari
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To define the curvature and its radius and discuss its properties in both cartesian and polar coordinate systems
- Define curve, graph, involute and evolute and solve related problems
- Study the curve tracing techniques on graphs and discuss some properties graphically
- Discuss the concepts of asymptotes, especially the asymptotes parallel to axes and inclined lines
- To examine various techniques of integration and apply them to definite and improper integrals

- To study about special integral functions, called beta and gamma functions

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – I / Core-1

CALCULUS (75 Hours)

Unit I : Curvature,Radius of Curvature and Centre of curvature in Cartesian and polar Coordinates

Unit II Pedal Equation-Involute and evolute-Asymptotes

Unit III Singular Points(Node,cusp,conjugate points)-Tracing of curves (cartesian only)

Unit IV Double and Triple Integrals - Changing the order of integration - Jacobians and change of variables

Unit V Beta and Gamma functions – Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals, Improper Integrals.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2018
1-L1	Unit I – Introduction and some basic definitions
2-L2	Curvature, centre of curvature and radius of curvature
3- L3	Cartesian formula for radius of curvature
4-L4	Problems in radius of curvature
5-L5	Parametric equation for rho
6-L6	Exercise problem discussion
7-L7	Polar form of radius of curvature
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Problems under polar form
10- L9	Centre of curvature
11-L10	Problems in centre of curvature
12-L11	p – r equations
13-L12	Finding the p – r equation of a curve
14-L13	Problem discussion on p – r equations
15-L14	Unit II – Definitions of Evolute and involute
16-L15	Finding the evolute of a parabola
17- L16	Finding the evolute of a hyperbola
18- L17	Finding the evolute of an ellipse
19- L18	Finding the radius of curvature using p – r equations
20- L19	Linear asymptotes – an introduction
21- L20	Finding the asymptotes parallel to axes - **Allotting portion for Internal Test-I**
	Internal Test I begins on 30.07.2018

22- L21	Finding the asymptotes for the equation of the type $F_n + F_{n-2} = 0$
23- IT-1	**Internal Test-I**
24- L22	Problems to find the linear asymptotes
25- L23	Exercise problem discussion
26- L24	The asymptotes for the equation of the type $(ax + by + c)^2\ F_{n+2} + F_{n-2} = 0$ - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Asymptotes by inspection
28- L26	Intersection of curve with asymptotes
29- L27	Unit III – Singular points: definitions of node, cusp and conjugate points
30- P2	**College level meeting/Cell function**
31-L28	Species of double points
32-L29	Investigate the nature of the origin
33-L30	Problems on node, cusp and conjugate points
34- L31	Determine the species of a cusp
35- L32	Problems on double points
36- L33	Problems to find the nature of the singular points on some curve
37- L34	Tracing of curves – short notes
38- L35	Steps to tracing a curve
39- L36	Problems on tracing of a curve
40- L37	Trace the curve – Problem discussion
41- L38	Problems discussion
42-P3	**Department Seminar**
43- L39	Unit IV – Integration - Recall
44- L40	Evaluation of the double integrals in cartesian coordinates
45- L41	Problems to solve the double integrals
46- L42	Changing the order of integration
47- L43	Problems in change of order of an integration - **Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
48- L44	Exercise problems discussion
49-IT-II	**Internal Test-II**
50-L45	Double integrals in polar coordinates
51- L46	Problems to find the double integrals in polar coordinates - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Triple integrals – solving method
53- L48	Problems on triple integrals
54- L49	Change of variables - Jacobian matrix and some important rules regarding Jacobian
55- L50	Transformation from cartesian to spherical coordinates
56- L51	Unit V – Improper integrals
57- L52	Problems on improper integrals
58- L53	Discussions on the convergence of some integrals
59-P4	**College level meeting/ function**
60- L54	Beta function – definition and some basic results
61- L55	Properties on beta function
62- L56	Gamma function – definition and some basic results

63- L57	Recurrence formula for Gamma function
64- L58	Further properties on beta function - **Allotting portion for Internal Test-III**
	Internal Test III begins on 08.10.2018
65- L59	Relation between beta and gamma functions
66- L60	Evaluations of some integral values using beta, gamma functions
67-IT-III	**Internal Test-III**
68- L61	Applications to gamma function
69- L62	Problem discussion on beta, gamma functions
70- L63	Problems on beta, gamma functions - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 22.10.2018
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course “CALCULUS”
CO1	Gain the knowledge on radius of curvature and can able to find radius of curvature for given surface in polar and cartesian coordinates
CO2	Able to solve problems on tracing of curve and analyse the properties graphically
CO3	Understand about singular points and able to explain the nodes, cusp and conjugate points
CO4	Analyse the concept of asymptotes which is parallel to both axis as well as to any inclined lines
CO5	Examine various techniques of integration and apply them to definite and improper integrals
CO6	Gain knowledge about special integral functions, called beta and gamma functions

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Classical Algebra
Course Code	SMMA12
Class	I year (2018-2019)
Semester	Odd
Staff Name	Mrs. P.Gino Metilda
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Gain the knowledge of Theory of equations .
- Understanding the concept of Powers of the roots of the equations
- To provide the understanding of Newton's method, Horner's method

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – I / Core - 2

CLASSICAL ALGEBRA (75 Hours)

Unit I Theory of Equations – Formation of equations – Relation between roots and coefficients – symmetric function of the roots.

Unit II Sum of the powers of the roots of an equation – Newton's theorem, Reciprocal Equations.

Unit III Transformation of equations, Descarte's rule of signs – Rolle's theorem

Unit IV Multiple roots, Sturm's Theorem, solving appropriate solution of equations using Newton's and Horner's method.

Unit V Biquadratic equations – solution by Ferrari's method – cubic equations – solutions by Cardon's method. Course Calendar

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2018
1-L1	Unit I Introduction of theory of equations
2-L2	Problems in Formation of equations
3- L3	Problems in Formation of equations
4-L4	Problems in Formation of equations
5-L5	Problems in Formation of equations
6-L6	Introduction to symmetric function of the roots
7-L7	Problems in symmetric function of the roots
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Problems in symmetric function of the roots
10- L9	Problems in symmetric function of the roots
11-L10	Problems in symmetric function of the roots
12-L11	Introduction to relation between roots and coefficient
13-L12	Problems in relation between roots and coefficient
14-L13	Problems in relation between roots and coefficient
15-L14	Unit II Introduction to the sum of the powers of the roots
16-L15	Problems in the sum of the powers of the roots
17- L16	Problems in the sum of the powers of the roots

18- L17	Problems in the sum of the powers of the roots
19- L18	Problems in the sum of the powers of the roots
20- L19	Problems in the sum of the powers of the roots
21- L20	Theory of equations to sum of the powers of the roots - **Allotting portion for Internal Test-I**
	Internal Test I begins on 30.07.2018
22- L21	Newton's theorem
23- IT-1	**Internal Test-I**
24- L22	Problems in the sum of the powers of the roots
25- L23	Problems in the sum of the powers of the roots
26- L24	Problems in the sum of the powers of the roots- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Problems in the sum of the powers of the roots
28- L26	Problems in the sum of the powers of the roots
29- L27	Unit III Introduction to Transformation of equations
30- P2	**College level meeting/Cell function**
31-L28	Problems in Transformation of equations
32-L29	Problems in Transformation of equations
33-L30	Problems in Transformation of equations
34- L31	Introduction to Descart's rule of signs
35- L32	Problems in Descart's rule of signs
36- L33	Problems in Descart's rule of signs
37- L34	Problems in Descart's rule of signs
38- L35	Problems in Descart's rule of signs
39- L36	Rolle's theorem
40- L37	Problems in Rolle's theorem
41- L38	Problems in Rolle's theorem
42-P3	**Department Seminar**
43- L39	Problems in Rolle's theorem
44- L40	Unit IV Definition of Multiple roots and theorem
45- L41	Problems in Multiple roots
46- L42	Problems in Multiple roots
47- L43	Sum of the powers of the roots to Multiple roots - **Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
48- L44	Strum's theorem and problems
49-IT-II	**Internal Test-II**
50-L45	Problems in strum's function
51- L46	Problems in strum's function- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Problems in strum's function
53- L48	Problems in strum's function
54- L49	Problems in Newton's method
55- L50	Problems in Newton's method
56- L51	Problems in Horner's method
57- L52	Problems in Horner's method
58- L53	Unit V Biquadratic equation- Solve the problems using Ferrar's method

59-P4	**College level meeting/ function**
60- L54	Solve the problems using Ferrar's method
61- L55	Solve the problems using Ferrar's method
62- L56	Solve the problems using Ferrar's method
63- L57	Cubic equation- Solve the problems by Cardon's method
64- L58	Strum's theorem to Cardon's method- **Allotting portion for Internal Test-III**
	Internal Test III begins on 08.10.2018
65- L59	Solve the problems by Cardon's method
66- L60	Solve the problems by Cardon's method
67-IT-III	**Internal Test-III**
68- L61	Solve the problems by Cardon's method
69- L62	Solve the problems by Cardon's method
70- L63	Solve the problems by Cardon's method- **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 22.10.2018
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course "CALCULUS"
CO1	Get the knowledge of Theory of equations
CO2	Solved the problems using the Powers of the roots of the equations
CO3	Get the knowledge of Strum's functions

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics (SF Courses)

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc (Mathematics)
Course Name	Statistics-I
Course Code	SAST11
Class	I year (2018-2019)
Semester	Odd
Staff Name	Mr. R. Arul Ananthan
Credits	3
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-4Hrs Dept. Meetings-0Hrs College Meetings-4Hrs Remaining 80Hrs (5 units; 5×16=80; 16 Hrs /unit (Approximately))	

Course Objectives

- How to calculate and apply measures of location and measures of dispersion – grouped and ungrouped data cases.
- How to calculate correlation and regression in various business problems.
- How to apply attributes to various types of problems.
- How to apply discrete and continuous probability distributions to various business problems.

- Provide a foundation and motivation for exposure to statistical ideas subsequent to the course.

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – I / Allied-1

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.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.062018
1-L1	UNIT I- Introduction to moments.
2-L2	Moment's definitions and problems.
3- L3	Moment's problems continued.
4-L4	Introducing the concepts of skewness and kurtosis
5-L5	Introducing the concept curve fitting and problems related to fir a straight line.
6-L6	Explain about how to fit a parabola.
7-L7	Curve fitting problems continued
8-L8	Curve fitting problems continued.

9-L9	Explain about discrete random variables.
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
10-L10	Curve fitting problems and applications.
11-L11	Curve fitting problems and applications continued.
12-L12	Curve fitting problems and applications continued.
13-L13	Curve fitting problems and applications continued.
14-L14	Curve fitting problems and applications continued.
15-L15	Curve fitting problems and applications continued.
16-L16	Curve fitting problems and applications continued.
17-L17	Curve fitting problems and applications continued.
18-L18	Curve fitting problems and applications continued.
19-L19	Curve fitting problems and applications continued.
20-L20	Curve fitting problems and applications continued.
21-L21	Unit – II -Introduction on Correlation coefficents
	Internal Test I begins on 30.07.2018
23-L22	Correlation coefficents
24-L23	Correlation problems.
25-L24	Correlation problems.
26-L25	Correlation coefficients continuation.
26-IT-1	**Internal Test-I**
27-L26	Correlation problems continued.
28-L27	Correlation problems continued.
29-L28	Correlation problems continued.
30-L29	Correlation problems continued.
31-L30	Correlation problems continued.
32-L31	Correlation problems continued.**- Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
33-L32	Problems related to regression.
34-P2	**College level meeting/Cell function**
34-L33	Problems related to regression.
35-L34	Problems related to regression.
36-L35	Problems related to regression.
37-L36	Problems related to regression.
38-L37	Problems related to regression.
39-L38	Problems related to regression.
40-L39	Problems related to regression.
41-L40	Problems related to regression.
42-L41	Problems related to regression.
43-L42	Unit –III – Theory of attributes –Introduction
44-L43	Class frequency and order of class explanation.
45- L44	Class frequency and order of class explanation.
46-L45	Class frequency and order of class explanation.
47-L46	Class frequency and order of class explanation.
48-L47	Explain the concept of dichotomisation
49-L48	Problems on Attributes.
50-L49	Classes and class frequency of attributes.
52-L50	Order of classes and class frequency of attributes.
53-L51	Explain the concept consistency of data.

54-L52	Explain the concept independence of attributes and some problems.
56-L53	Explain consistency of data and problems - **Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
57-L54	Explain consistency of data and problems
58-L55	Explain about condition of consistency and problems.
59-IT-II	**Internal Test-II**
59-L56	Explain consistency of data and problems
60-L57	Explain about condition of consistency and problems.
61-L58	Problems on Yule's coefficient of association- **Test Paper distribution and result analysis.**
	Entering Internal Test-II Marks into University portal
62-L59	Problems on Yule's coefficient of association**.**
63-L60	Problems on Yule's coefficient of association**.**
64-L61	Problems on Yule's coefficient of association**.**
65-L62	UNIT IV -Introduction to statistics and Random variable.
66-L63	Definition of continuous random variables and their problems.
67-L64	Continuous random variables and their problems are continued.
68-L65	Explain about expected value of random variable and related problems.
69-L66	Problems of expected value of random variable are continued.
70-L67	Introducing the concept of moment generating function and do some problems related to moment generating function.
71-L68	Introduce the concept of cumulative generating function.
72-L69	Cummulants generating function problems.
73-L70	Cummulants generating function properties.
74-P4	**College level meeting/ function**
75-L71	Problems on cummulants generating function.
76-L72	UNIT – V Recurrence, characteristic functions.
77-L73	Recurrence, characteristic functions.
78-L74	Recurrence, characteristic functions.
79- L75	Moments about origin , mean and problems.
80 – L76	Mgf, mean and variance of poisson distribution
81-L77	Mgf, mean and variance of poisson distribution**- Allotting portion for Internal Test-III.**
	Internal Test III begins on 08.10.2018
82-IT-III	**Internal Test-III**
83 – L78	Poisson distribution problems continued.
84 –L78	Introducing the concept of normal distribution & Problems
85 –L79	Normal distribution problems **- Test Paper distribution and result analysis.**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 22.10.2018
86-MT	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90- L80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "STATISTICS–I"
CO1	Use appropriate statistical methods in the analysis of simple data sets.
CO2	Students will summarize data visually and numerically
CO3	Appreciate the importance of probability and statistics in computing and research.
CO4	Draw Scatter diagram.
CO5	Interpret and clearly present output from statistical analyses in a clear concise and understandable manner.
CO6	Application of attributesin various fields.
CO7	Demonstration an understanding of the basic concepts of probability and random variables.
CO8	Apply inferential methods relating to the means of Normal distributions.
Experimental Learning	
EL1	To categories and collect differentdata related to population for calculating moments about mean.
EL2	GD on application of correlation coefficients and rank correlation.
EL3	Collect different data for calculating Yule's coefficients of attributes.
Integrated Activity	
IA1	Prepare chart for binomial,normal and poisson distributions.
IA2	How statistics used in day-today life.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

Forslow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B.Sc. Mathematics
Course Name	Environmental Studies
Course Code	SEVS21
Class	I year (2018-2019)
Semester	Odd
Staff Name	1. Mrs. P. Gino Metilda 2. Mr. R. Arul Ananthan
Credits	2
L. Hours /P. Hours	2 / WK
Total 30Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 20Hrs (5 units; 5×4=20; 4Hrs /unit)	

Course Objectives

- Use and over-utilization of surface and ground water

- Mineral resources: Use and exploitation
- Growing energy needs

Syllabus

UNIT I: THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Definition, scope and importance Natural resources and associated problems:Forest resources: Use and over-exploitation, deforestation, timber extraction, dams and their effects on forests and tribal people. – Water resources: Use and over-utilization of surface and ground water, floods, drought, dams-benefits and problems, water conservation and watershed management. -Mineral resources: Use and exploitation, environmental effects.- Food resources: World food problems, changes, effects of modern agriculture, fertilizer-pesticide problems. -Energy resources: Growing energy needs, renewablesndlnon renewable energy sources, alternate energy sources.- Land resources: Land as a resource, land degradation, man-induced landslides, soil erosion and desertification.

UNIT II: ECOSYSTEMS

Forest Ecosystem -Grassland Ecosystem -Desert ecosystem - Aquatic Ecosystem (Ponds, rivers, oceans, estuaries) -Energy flow in the ecosystem-Ecological succession-Food Chains, Food Webs and Ecological Pyramids.

UNIT III: BIODIVERSITY AND ITS CONSERVATION

Introduction Definition: Genetic, species and ecosystem diversity-Biogeographical classification of Jndia -Values of Biodiversity- Biodiversity at global, national and local levels- India as a mega-diversity nation- Hot-Spots of biodiversity -Threats to biodiversity -Endangered and endemic species of India -Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity**.**

UNIT IV: ENVIRONMENTAL POLLUTION

Definition- Causes, effects and control measures of:-Air Pollution -Water Pollution -Soil Pollution - Marine Pollution - Noise Pollution.- Thermal Pollution -Solid Waste Management - Disaster Management: Floods, earthquake, cyclone and landslides.

UNIT V: SOCIAL ISSUES AND THE ENVIRONMENT

Climatic change, global warming, acid rain, ozone depletion.- Wasteland reclamation - Consumerism and Waste products, use and through plastics Environment Protection Act- Air (Prevention and Control of Pollution) Act -Water (Prevention and Control of Pollution) Act -

Wildlife Protection Act Forest Conservation Act -Population Explosion — Family Welfare Programme Human Rights

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2018
1-L1	**Unit-1**:Forest resources: Use and over-exploitation, deforestation, timber extraction, dams and their effects on forests and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, dams-benefits and problems, water conservation and watershed management.
2-L2	Energy resources: Growing energy needs, renewable and non renewable energy sources, alternate energy sources-
3- P1	**Welcoming of First year and Inauguration of BCA Association**
4-L3	Mineral resources: Use and exploitation, environmental effects.
5-L4	Land resources: Land as a resource, land degradation, - **Allotting portion for Internal Test-I**
	Internal Test I begins on 30.07.2018
6-IT-I	**Internal Test-I**
7-L5	man-induced landslides, soil erosion and desertification - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
8-L6	Food resources: World food problems, changes, effects of modern agriculture, fertilizer-pesticide problems**.**
9-L7	Unit-2: Forest Ecosystem -Grassland Ecosystem -Desert ecosystem - Aquatic Ecosystem (Ponds, rivers, oceans, estuaries)
10-P2	**College level meeting/Cell function**
11-L8	Energy flow in the ecosystem-Ecological succession-Food Chains, Food Webs and Ecological Pyramids.
12-L9	Unit-3: Introduction Definition: Genetic, species and ecosystem diversity-Bio geographical classification of India -Values of Biodiversity- Biodiversity at global, national and local levels
13-P3	**Department Seminar**
14-L10	India as a mega-diversity nation- Hot-Spots of biodiversity -Threats to biodiversity -Endangered and endemic species of India -Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity**.**
15-L11	Unit-4: Definition- Causes, effects and control measures of:- -
16-L12	Water Pollution -Soil Pollution - Marine Pollution- **Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
17-IT-1	**Internal Test-II**
18-L13	Air Pollution - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
19-L14	Noise Pollution.- Thermal Pollution -Solid Waste Management - Disaster

	Management: Floods, earthquake, cyclone and landslides.
20- P2	**College level meeting/ function**
21-L15	Unit-5: Climatic change, global warming, acid rain, ozone depletion.- Wasteland reclamation -Consumerism and Waste products, use and through plastics Environment Protection Act
22-L16	Air (Prevention and Control of Pollution) Act -Water (Prevention and Control of Pollution) Act
23- L17	Wildlife Protection Act Forest Conservation Act - **Allotting portion for Internal Test-III**
	Internal Test III begins on 08.10.2018
24- IT-III	**Internal Test-III**
25-L18	Population Explosion — Family Welfare Programme Human Rights- **Test Paper distribution and result analysis**
	Model Test begins on 22.10.2018
	Entering Internal Test-III Marks into University portal
26-MT	**Model Test**
27-MT	**Model Test**
28-MT	**Model Test**
29-L19	**Model test paper distribution and previous year university question paper discussion**
30-L20	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	
CO1	Energy flow in the ecosystem-Ecological succession-Food Chains, Food Webs and Ecological Pyramids
CO2	Noise Pollution.- Thermal Pollution -Solid Waste Management -Disaster Management: Floods, earthquake, cyclone and landslides
CO3	Climatic change, global warming, acid rain, ozone depletion.-Wasteland reclamation
Experimental Learning	
EL1	Soil Pollution
EL2	Disaster Management
Integrated Activity	
IA1	Field Work
IA2	Village Visit

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Real Analysis - I
Course Code	SMMA31
Class	II year (2018-2019)
Semester	Odd
Staff Name	Mr. C. Prabu Daniel Pakkianathan
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To lay a god foundation of classical analysis.
- To study the behaviour of sequences and series
- To understand the several types of sequences and series

CORE PAPER –V

REAL ANALYSIS - I (90 Hours) (SMMA31)

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. **11L**

Unit II Sequences : Bounded sequences – monotonic sequences – convergent sequences – divergent and oscillating sequences – The algebra of limits. **17L**

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. **19L**

Unit IV Series : Infinite series – nth term test – Comparison test – Kummer‟s test – D'Alemberls ratio test – Raabe's test - Gauss test – Root test **23L**

Unit V Alternating series – Leibnitz's test - Tests for convergence of series of arbitrary terms – Multiplication of series- Abel's Throrem-Mertens theorem-Power Series - Radius of convergence **20L**

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2018
1-L1	**Unit -I Real number system :**The field of axioms,
2-L2	Discuss about the order axioms
3- L3	Discuss about the rational numbers, the irrational numbers,
4-L4	Discuss about the least upper bound (supremum). upper bounds,
5-L5	Solved examples discuss
6-L6	Discuss about The completeness axiom
7-L7	Discuss about theabsolute values.
8-L8	Discuss about the triangle inequality
9-L9	Solved examples discuss
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Discuss about theCauchy – schwartz‟s inequality.
12-L11	Solved examples discuss
13-L12	**Unit –II Sequences :** definition of Bounded sequences and examples
14-L13	Problems on bounded sequence
15-L14	Monotonic sequences
16-L15	Problems on monotonic sequence
17-L16	Convergent sequences
18-L17	Problems on convergent sequence

19-L18	Divergent and oscillating sequences
20-L19	Problems on divergent and oscillating sequences sequence
21-L20	The algebra of limits.
22-L21	Solved examples
23-L22	Solved examples- **Allotting portion for Internal Test-I**
	Internal Test I begins on 30-7-2018
24-L23	Any convergent sequence is a bounded sequence
25-L24	Problems on algebra of limits
26-IT-1	**Internal Test-I**
27-L25	**Unit III** Behaviour of monotonic sequences
28-L26	Discuss the behaviour of the geometric sequence
29-L27	Cauchy‟s first limit theorem
30-L28	Solved examples- **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Solved problems
32- L30	Cauchy‟s second limit theorem
33- L31	Cesaro‟s theorem
34-P2	**College level meeting/Cell function**
35- L32	Definition of subsequencesand examples
36- L33	Problems on sequence
37- L34	Cauchy sequence
38- L35	Solved examples
39- L36	Cauchy‟s general principle of convergence.
40- L37	Limit points
41- L38	Unit IV Series :definition of Infinite series and examples
42- L39	Problems on series
43- L40	Comparison test
44- L41	Convergence discuss on Thereom 4.5 and thereom 4.6
45- L42	Theorem on Kummer‟s test
46- L43	D'Alembert's ratio test and rabbe's test
47- L44	Theorem on Gauss test
48- L45	Solved problems
49- L46	Root test and condensation test
50- L47	Solved problems
51- P3	**Department Seminar**
52- L48	**Unit V** Alternating series
53- L49	Leibnitz's test
54- L50	Solved problems
55- L51	Tests for convergence of series of arbitrary terms – Multiplication of series
56-L52	Solved examples- **Allotting portion for Internal Test-II**
	Internal Test II begins on 03-9-18
57-L53	Absolute convergence
58-L54	Problems on absolute convergence
59-IT-II	**Internal Test-II**
60- L55	Dirichlet's test
61- L56	Solved examples- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Example problems discuss

63- L58	Abel's Theorem
64- L59	Solved problems
65- L60	Test the convergence of series of arbitrary terms
66- L61	Mertens theorem
67- L62	Solved problems
68- L63	Power Series
69- L64	Multiplication of power series
70- L65	Solved examples
71- L66	The Cauchy product of two divergent series may be conergent
72- L67	Solved examples
73- L68	Sufficient condition for the convergence of the xauchy product of two series.
74-P4	**College level meeting/ function**
75- L69	Radius of convergence
76- L70	Solved examples
77- L71	Exercise problems solve
78- L72	Example problems
79- L73	Solved examples- **Allotting portion for Internal Test-III**
	Internal Test III begins on 08-10-18
80- L74	Revision some basic definitions
81- L75	Solved examples
82-IT-III	**Internal Test-III**
83- L76	Exercise problems solve
84- L77	Solved examples- **Test Paper distribution and result analysis**
85- L78	Previous Semester questions discuss
	Entering Internal Test-III Marks into University portal
	Model test begins on 22-10-18
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Real Analysis - I”
CO1	Describe fundamental properties of the real numbers that lead to the formal development of real analysis.
CO2	Comprehend rigorous arguments developing the theory underpinning real analysis
CO3	Demonstrate an understanding of limits and how they are used in sequence ,series.
CO4	Construct rigorous mathematical proofs of basic results in analysis.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Vector Calculus
Course Code	SSMA3A
Class	II year (2018-2019)
Semester	Odd
Staff Name	Mr. Jeshua Rajan
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To provide basic knowledge of vector differentiation and vector integration
- To solve problems related to that
- To explain about line integrals, surface integrals

Skill Based Core

Paper – I

VECTOR CALCULUS (60 Hours) (SSMA3A)

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 **13L**

Unit II Divergence – Curl, solenoidal, irrotational vectors – Laplacian operator. **12L**

Unit III Integration of point function – Line integral – Surface integral. **13L**

Unit IV Volume integral – Gauss divergence theorem (statement only) – Problems. **12L**

Unit V Greens theorem and Stoke's theorem (statements only) – problems. **10L**

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2018
1-L1	Unit I – Vector functions, limit of a vector function, examples, vector point functions.
2-L2	Derivative of a vector function and its properties;
3- L3	Derivative of box, vector and dot products - basic properties and some standard problems
4-L4	Scalar point functions and vector point functions - Level functions
5-L5	Solving problems in derivative of vector and scalar point functions
6-L6	Directional derivative of a scalar point function
7-L7	Problems on directional derivatives
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**

9- L8	The vector operator ‘del’ - Gradient of a scalar point function
10- L9	Summation notation for gradient and gradient of sum/product of scalar point functions
11-L10	Some standard properties under gradient
12-L11	Unit II – Divergence and curl of a vector point functions
13-L12	Solenoidal and irrotational vectors - problems
14-L13	Summation notations for curl and divergence and its basic properties
15-L14	Problem discussion under curl - **Allotting portion for Internal Test-I**
	Internal Test I beginson 30.07.2018
16-L15	Solving problems under divergence
17-IT-1	**Internal Test-I**
18-L16	The Laplacian differential operator
19-L17	Laplace function and Harmonic function - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Divergence of a curl of a vector; Divergence of a divergence of a vector.
21- L19	Standard properties on Laplacian differential operator
22- P2	**College level meeting/Cell function**
23-L20	Problems on Laplacian differential operator
24-L21	Unit III –Integration of Point functions : Line integrals
25-L22	Particular forms of line integrals
26-L23	Integrals along a closed curve
27-L24	Independence of path of integration - A necessary and sufficient condition
28-L25	Problems in independent of path of integration
29-L26	Conservative field and scalar potential; line integrals of a conservative field under simple closed curve
30-L27	A necessary and sufficient condition for a vector field to be conservative
31-L28	Surface integrals - Evaluation of surface integral
32-L29	Problems on surface integrals
33-L30	Hemispherical Surface
34- P3	**Department Seminar**
35-L31	Unit IV – Volume integrals
36-L32	Polar coordinates, Cylindrical coordinates and Spherical coordinates – **Allotting portion for Internal Test-II**
	Internal Test II beginson 03.09.2018
37- L33	Solving problems in volume integrals
38- IT-II	**Internal Test-II**
39-L34	Finding volume integrals by changing coordinates systems
40-L35	Calculating triple integral values over the volume of a region - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Gauss’ divergence theorem : a connection between surface and volume integrals
42- L37	Verifying Gauss’ divergence theorem on some certain region
43- L38	Integral theorems derived from the divergence theorem
44- P4	**College level meeting/ function**
45-L39	Finding surface integrals using Gauss’ divergence theorem
46-L40	Finding volume integrals using Gauss’ divergence theorem
47-L41	Unit V – Green’s theorem in plane

48-L42	Stokes' theorem
49-L43	Integral theorems derived from Stokes' theorem
50-L44	Operational meaning of 'Del' in terms of surface integrals – **Allotting portion for Internal Test-III**
	Internal Test III beginson 08.10.2018
51 L45	Operational meaning of 'Del dot' in terms of surface integrals
52- L46	Operational meaning of 'Del cross' in terms of surface integrals
53-IT-III	**Internal Test-III**
54-L47	Problems on Stokes' theorem and its verification using some vector functions
55-L48	Problems on Green's theorem and its verification using some vector functions
	Entering Internal Test-III Marks into University portal
	Model Test begins on 22.10.2018
56- MT	**Model Test**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Vector Calculus"
CO1	Can able to solve problems under gradient and derivative of complicated functions
CO2	Gain knowledge on directional derivatives
CO3	Able to explain about line integrals, surface integrals
CO4	Solve the problems using Gauss' divergence theorem
CO5	Can verify the Stokes' and Greens' theorems using problems

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Mathematics for Competitive Examinations-I
Course Code	SNMA3A
Class	II year (2018-2019)
Semester	Odd
Staff Name	1. Mr. JeshuaRajan 2. Mr. R. Arul Ananthan
Credits	2
L. Hours /P. Hours	2 / WK
Total 30Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 20Hrs (5 units; 5×4=20; 4Hrs /unit)	

Course Objectives

- To learn the problems solving techniques for aptitude problems
- To enable the students prepare themselves for various competitive examinations

Syllabus

Non – Major Elective Paper – I
Mathematics for Competitive Examinations -I (30 Hours) (SNMA3A)

Unit I

Simplifications, averages 7L

Unit II

Ratio and proportion 5L

Unit III

Partnership – Percentage 5L

Unit IV

Profit and Loss 6L

Unit V

Problems on numbers 7L

Text Book:

Objective Arithmetic – R.S. Aggarwal – S.Chand& Co

Books for Reference :

- Quantitative Aptitude for Competitive examinations – AbhijitGuha – TMH
- Mathematics for life – M. Immaculate – Nanjil offset Printers

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2018

1-L1	Unit I – Simplifications – the rule 'BODMAS'
2-L2	Simple problems using BODMAS
3- P1	**Welcoming of First year and Inauguration of Department Association**
4-L3	Averages – Problem discussion
5-L4	Problems on Averages –**Allotting portion for Internal Test-I**
	Internal Test I begins (30.07.2018)
6-IT-I	**Internal Test-I**
7-L5	Unit II – Ratio: basic results and problems - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
8-L6	Proportion: means, extremes - Problems
9-L7	Problems on ratio and proportion
10-P2	**College level meeting/Cell function**
11-L8	Unit III – Results on Partnership and some problems
12-L9	Problems on Partnership
13-P3	**Department Seminar**
14-L10	Percentage calculation
15-L11	Problems using Percentage
16-L12	Unit IV –Profit and Loss - **Allotting portion for Internal Test-II**
	Internal Test II begins (03.09.2018)
17-IT-1	**Internal Test-II**
18-L13	Celling price, cost price, Gain and loss calculating method –**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
19-L14	Problems for profit and loss calculations
20- P2	**College level meeting/ function**
21-L15	Unit V –Problems on numbers
22-L16	Problems to finding numbers using its ratio
23- L17	Problems to finding numbers using its sum and products - **Allotting portion for Internal Test-III**
	Internal Test III begins (08.10.2018)
24- IT-III	**Internal Test-III**
25-L18	Problems on numbers –**Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins (22.10.2018)
26-MT	**Model Test**
27-MT	**Model Test**
28-MT	**Model Test**
29-L19	**Model test paper distribution and previous year university question paper discussion**
30-L20	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Mathematics for Competitive Examinations-I"
CO1	After studying this course, students can able to

	solve problems using BODMAS
CO2	deal problems on numbers
CO3	do problems using ratio and proportion
CO4	calculate profit or loss in any scenario
Experimental Learning	
EL1	Solve previously asked questions in RRB exams and Bank exams.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Algebra – II
Course Code	PMAM21
Class	I year (2017-2018)
Semester	Even
Staff Name	Mr. Jeshua Rajan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To understand the concepts on ring theory
- To classify the properties in Euclidean rings and Principal ideal rings
- To explain about the polynomial rings over some specific spaces
- To study the various types of radicals and direct sum of rings

Syllabus

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**

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07.12.2017
1-L1	Unit I – Introduction to ring and ring homomorphism
2-L2	Kernel of a ring homomorphism and results on it.
3- L3	Examples to explain ring homomorphism and its kernel; definition of Isomorphism
4-L4	Ideal of a ring and examples
5-L5	Illustration of Quotient ring and its homomorphic image
6-L6	Necessary condition for a commutative ring to become a field
7-L7	Maximal ideals; the structure of maximal ideals of the ring of integers
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Necessary and sufficient condition for an ideal of a commutative ring to be a maximal ideal
10- L9	Imbedding a ring into another ring
11-L10	Every integral domain can be imbedded in a field – Proof discussion
12-L11	Every integral domain can be imbedded in a field – Proof discussion (contd.)
13-L12	The field of Quotients of an integral domain
14-L13	Unit II – Integral domain, zero divisors, and Euclidean ring
15-L14	Characterization of ideals in a Euclidean ring
16-L15	Definition of Principal ideal ring and implications between Euclidean ring and Principal ideal ring
17- L16	Definition of ‘divide’ and some results on it
18- L17	greatest common divisor of two elements and its general form in a Euclidean ring
19- L18	‘Units’ in a commutative ring and some properties

20- L19	Associate elements in a commutative ring and d-value of non-unit elements
21- L20	Prime element in a Euclidean ring and expression of every elements in prime factors - **Allotting portion for Internal Test-I**
	Internal Test I begins on 22.01.2018
22- L21	Relatively prime and its property in a Euclidean ring
23- IT-1	**Internal Test-I**
24- L22	Unique Factorization theorem
25- L23	Necessary and sufficient condition for the generating element of an ideal in a Euclidean ring R to be a prime element of R
26- L24	The particular Euclidean ring J[i] - **Test Paper distribution and result analysis**
27- L25	Basic lemmas to prove Fermat theorem
28- L26	Proof of Fermat theorem
29- L27	Unit III – The Polynomial ring F[x] over a field. Defining the equality, sum, product of polynomials
30- P2	**College level meeting/Cell function**
31-L28	Degree of a polynomial and finding the degree of the product of two or more polynomials
32-L29	The Division Algorithm in a polynomial ring
33-L30	Irreducible polynomials over the field and the structure of maximal ideals in polynomial ring
34- L31	Primitive polynomials and its property
35- L32	Content of a polynomial and Gauss' Lemma
36- L33	Integer monic polynomials and The Eisenstein Criterion
37- L34	The polynomial rings over a commutative ring
38- L35	Definition of Unique factorization domain (UFD)
39- L36	The existence of greatest common divisor of any two elements in a UFD
40- L37	Content, primitive concepts in the polynomial rings over a commutative ring
41- L38	Unique factorization of primitive polynomial in R[x] if R is UFD
42-P3	**Department Seminar**
43- L39	The implication of unique factorization domain between R and R[x]
44- L40	Unit IV – Jacobson radical of a ring (rad R); semi-simple ring
45- L41	Finding rad R for some rings, namely ring of integers, C[0,1] and ring of formal power series
46- L42	Structure of an ideal that is subset of the Jacobson radical
47- L43	Corollaries to discuss about idempotent element, nil ideal, invertible elements using 'rad R'. - **Allotting portion for Internal Test-II**
	Internal Test II begins on 26.02.2018
48- L44	Proving that the quotient ring R/rad R is semi-simple.
49-IT-II	**Internal Test-II**
50-L45	Expressing the Jacobson radical of a quotient ring R/I as a function of the radical of R.
51- L46	Necessary and sufficient condition for that a principal ideal domain to be semi-simple; and its consequences. - **Test Paper distribution and result analysis**
52- L47	Prime radical of a ring 'Rad R' and its results

53- L48	Nil radical of an ideal in a ring
54- L49	Relation between the Jacobson and nil radical in the ring of polynomials R[x]
55- L50	Idempotent of a quotient ring can be raised or lifted into the ring – Definition and its results
56- L51	Unit V – Quasi-regular elements in a ring; existence of quasi-regular elements and quasi-inverse
57- L52	The 'circle operation' of Perlis; and some results under circle operation
58- L53	*J*-radical J(R) of a ring and *J*-semisimple ring – Definitions, examples
59-P4	**College level meeting/ function**
60- L54	Claiming that the *J*-radical is an ideal of the ring
61- L55	Proving that the quotient ring R/J(R) is *J*-semisimple.
62- L56	Complete direct sum of the collection of rings
63- L57	Discrete direct sum of the collection of rings and i^{th} component projections
64- L58	Subdirect sum. Structure of a ring that is isomorphic to a subdirect sum of a collection of rings –**Allotting portion for Internal Test-III**
	Internal Test III begins on 01.04.2018
65- L59	Some examples and theorems under subdirect sum
66- L60	A necessary condition of a ring which is prerequisite to study Artinian rings
67-IT-III	**Internal Test-III**
68- L61	Chinese Remainder Theorem and definition of 'sub-directly irreducible'
69- L62	Birkhoff theorem – Proof discussion
70- L63	Heart of a ring and McCoy theorem - **Test Paper distribution and result analysis**
	Model Test begins on 12.04.2018
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra II"
CO1	After studying this course, Students can have a better ability to explain about ring and ring homomorphism.
CO2	Illustrate about ideals and some special kind of ideals
CO3	Classify the properties in Euclidean rings and Principal ideal rings
CO4	Ability to solve problems in Euclidean rings and its particular rings
CO5	Can explain about certain radicals of a ring, such as, Jacobson radical, nil radical, prime radical and *J*-radical.
CO6	Classify the difference between complete direct sums, discrete direct sums, subdirect sums

Experimental Learning	
EL1	Differentiate the types of rings graphically
EL2	Classifications on certain radicals of a ring
EL3	The defining manner of Euclidean ring is demonstrating as an generalization of ring of integers
EL4	Motivated to solve CSIR-NET questions based on ring theory

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis II
Course Code	PMAM22
Class	I year (2017-2018)
Semester	Even
Staff Name	Mrs. P.Gino Metilda
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Understanding the concept of Riemann Integral.
- Gain Knowledge about Uniform convergence
- Understanding the concept of Power series, Fourier series

- Gain Knowledge of Gamma functions

Syllabus

2.1 Paper 7: ANALYSISII

Text Book: Principles of Mathematical Analysis, Third Edition, Walter Rudin – McGraw Hill International BookCompany.

UnitI: Definition and Properties of Integral – Integration andDifferentiation.
Chapter 6: Section: 6.1 – 6.22.

Exercise Problems: Chapter 6: 1, 2, 4, 5, 10, 11.

UnitII: Integration of vector valued functions – Rectifiable arcs, Sequence and Series of functions: Discussion of main problem – Uniform Convergence – Uniform Convergence andContinuity.
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.

UnitIV: The Stone Weierstrass Theorem - PowerSeries.
Chapter 7: Section: 7.26– 7.33 and **Chapter 8:** Section: 8.1 – 8.5.

Exercise Problems: Chapter 8: 1 – 5.

UnitV: 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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Unit I Definition of Riemann Integral and examples
2-L2	Theorems in Riemann Integral
3- L3	Theorems in Riemann Integral

4-L4	Properties of the Integral
5-L5	The fundamental theorem of calculas
6-L6	Theorem of Integration by parts
7-L7	Theorems in Riemann Integral
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Theorems in Riemann Integral
10- L9	Introduction of vector valued functions
11-L10	Theorems in vector valued functions
12-L11	Theorems in vector valued functions
13-L12	Definition of rectifiable curve and theorems
14-L13	Theorems in rectifiable curve
15-L14	Unit II Definition of convergent sequence and convergent series with examples
16-L15	Theorems in convergent sequence and convergent series
17- L16	Theorems in convergent sequence and convergent series
18- L17	Problems in convergent sequence and convergent series
19- L18	Problems in convergent sequence and convergent series
20- L19	Definition of Uniform convergence and examples
21- L20	Riemann Integral to convergent sequence - **Allotting portion for Internal Test-I**
	Internal Test I begins on 22.01.2018
22- L21	Cauchy criterion theorem
23- IT-1	**Internal Test-I**
24- L22	Wierestrass theorem
25- L23	Theorems in Uniform convergent sequence
26- L24	Theorems in Uniform convergent sequence- **Test Paper distribution and result analysis**
27- L25	Theorems in Uniform convergent sequence
28- L26	Problems in Uniform convergent sequence
29- L27	Unit III Definition of Integrations and examples
30- P2	**College level meeting/Cell function**
31-L28	Theorems in Integrations
32-L29	Theorems in Integrations
33-L30	Theorems in Integrations
34- L31	Theorems in Integrations
35- L32	Problems in Integrations
36- L33	Problems in Integrations
37- L34	Theorems in Equicontinuous
38- L35	Theorems in Equicontinuous
39- L36	Theorems in Equicontinuous
40- L37	Theorems in Equicontinuous
41- L38	Problems in Equicontinuous
42-P3	**Department Seminar**
43- L39	Equicontinuous
44- L40	Unit IV The stone wierestrass theorem
45- L41	The stone wierestrass theorem

46- L42	Definition of algebra, Uniform closure and examples
47- L43	Cauchy criterian theorem toEquicontinous - **Allotting portion for Internal Test-II**
	Internal Test II begins on 26.02.2018
48- L44	Theorems in algebra and Uniform closure
49-IT-II	**Internal Test-II**
50-L45	Theorems in algebra and Uniform closure
51- L46	Theorems in algebra- **Test Paper distribution and result analysis**
52- L47	Theorems in algebra and Uniform closure
53- L48	Theorems in algebra and Uniform closure
54- L49	Stone generalisation theorem
55- L50	Introduction in Power series and theorems
56- L51	Theorems in Power series
57- L52	Taylors theorem
58- L53	Unit V Introduction to The algebraic completeness of the complex field
59-P4	**College level meeting/ function**
60- L54	Theorems in the algebraic completeness of the complex field
61- L55	Definition of Fourier series and theorems
62- L56	Definition of orthonormal and orthogonal and theorems
63- L57	Parsevels Theorem
64- L58	Stone wierestrass theorem to Parsevels theorem- **Allotting portion for Internal Test-III**
	Internal Test III begins on 01.04.2018
65- L59	Introduction to gamma function and theorem
66- L60	Some results in gamma functions
67-IT-III	**Internal Test-III**
68- L61	Some results in gamma functions
69- L62	Stirling formula
70- L63	Stirling formula- **Test Paper distribution and result analysis**
	Model Test begins on 12.04.2018
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Analysis II”
CO1	Describes fundamental properties of Riemann Integral
CO2	Solved Problems in Riemann Integral

CO3	Describes the Properties in Power series
CO4	Solving the problems using Power series

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Classical Mechanics
Course Code	PMAM23
Class	I year (2017-2018)
Semester	Even
Staff Name	Mrs. T. Santhakumari
Credits	4
L. Hours /P. Hours	5 / WK

Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)

Course Objectives

- To study mechanical systems under generalized coordinate systems, virtual work, energy and momentum
- To study mechanics developed by Newton, Langrange, Hamilton and Jacobi

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begins on 07.12.2017
1-L1	Unit I – Introduction: Mechanics of a single particle
2-L2	Conservation theorem for linear momentum of a single particle
3- L3	Conservation theorem for angular momentum of a single particle
4-L4	Some remarks on conservation theorems
5-L5	Energy conservation theorem
6-L6	Problem discussion on mechanics of a single particle
7-L7	Mechanics of a system of particles
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Conservation theorem for linear momentum of a system of particles
10- L9	Conservation theorem for angular momentum of a system of particles
11-L10	Theorems on Kinetic energy
12-L11	Problem discussion on Kinetic energy
13-L12	Energy conservation theorem
14-L13	Exercise problems using conservation theorem
15-L14	Unit II – Constraints: Different types of constraints
16-L15	Examples for holonomic constraints and non-holonomic constraints
17- L16	Virtual work and D'Alembert's Principle
18- L17	Lagrange's equation from D'Alembert's Principle – Theorem
19- L18	Lagrange's equation for non-holonomic constraints
20- L19	Velocity dependent potentials
21- L20	Rayleigh Dissipation function –**Allotting portion for Internal Test-I**
	Internal Test I begins on 22.01.2018
22- L21	Lagrangian for charged particle and some problems
23- IT-1	**Internal Test-I**
24- L22	Applications of the Lagrangian equation
25- L23	Lagrangian for a single particle (i) in cartesian coordinates (ii) in polar coordinates
26- L24	Lagrangian for Atwood machine - **Test Paper distribution and result analysis**

27- L25	Time dependent potential
28- L26	Problem - bead sliding on rotating wire and some exercise problems
29- L27	Unit III – Variation principles and lagrange's equation - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Hamilton's principle
32-L29	Stationary values
33-L30	Path of a system – congugration
34- L31	
35- L32	Techniques of calculus of variation - theorem
36- L33	Lagrange's equation from Hamilton's principle
37- L34	Shortest distance between two point in a space
38- L35	Minimum surface of revolution
39- L36	Brachistochrone problem
40- L37	Extension of Hanilton's Principle
41- L38	Extension of Hanilton's Principle non-holonomic system
42-P3	**Department Seminar**
43- L39	Unit IV –Two body central force problem
44- L40	Reduction to one body problem
45- L41	The equations of motion and first integral theorem
46- L42	The Kepler's Second law of planetary motion
47- L43	Derivatives - **Allotting portion for Internal Test-II**
	Internal Test II begins on 26.02.2018
48- L44	Illustrations about derivative and motion
49-IT-II	**Internal Test-II**
50-L45	The equivalent one dimensional problems
51- L46	Classification of orbits - **Test Paper distribution and result analysis**
52- L47	Examples of the method occurs for a linear restoring force
53- L48	Inverse square law for circular orbits
54- L49	The virial theorem.
55- L50	Problem discussion based on the virial's theorem
56- L51	Unit V – The differential equation for the orbit
57- L52	Problems on differential equation for the orbit
58- L53	Integrable power-law potentials
59-P4	**College level meeting/ function**
60- L54	The Kepler problem
61- L55	Inverse square law of force
62- L56	Nature of the orbit depends on e and E
63- L57	The motion in time in the Kepler problem
64- L58	Deriving the approximate version of the Kepler's third law – **Allotting portion for Internal Test-III**

	Internal Test III begins on01.04.2018
65- L59	Existence of conserved vector **A** for the Kepler problem
66- L60	The Laplace-Runge-Lenz vector
67-IT-III	**Internal Test-III**
68- L61	Problem discussion
69- L62	Scattering in a central force field
70- L63	Relation of orbit parameters and scattering angle - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 12.04.2018
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course “Classical Mechanics”
CO1	Able to understand D’ Alembert’s Principle and simple applications of the Lagrangian Formulation.
CO2	Able to analyze the Derivation of Lagrange’s Equations from Hamilton’s Principle and Extension of Hamilton’s Principle to Non-holonomic Systems
CO3	Able to study the concept of the Equations of Motion and the Equivalent One-Dimensional Problems.
CO4	Able to understand the Kepler Problem and Inverse-Square Law of Force.
CO5	Able to distinguish the concept of the Hamilton Equations of Motion and the Principle of Least Action.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Differential Geometry
Course Code	PMAM24
Class	I year (2018-2020)
Semester	Even
Staff Name	Mrs. P. Gino Metilda
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To be able to understand the fundamental theorem for plane curves
- To understand fundamental abstract topological structures
- To improve problem solving skills
- To introduce essential ideas and methods of differential geometry

Syllabus

DIFFERENTIAL GEOMETRY

Unit I: The theory of space curves – Definitions , Arc length – Tangent – Normal and Binormal – Curvature and Torsion.

Unit II: Contact between curves and surfaces – Tangent Surface – Involutes and evolutes – Helices

Unit III: Definition of a surface – Curves on a surface – Helicoids – Metric – Direction Coefficients.

Unit IV: Families of curves – Geodesics , Canonical geodesic equation, Normal Property of geodesics (Christoffel symbols not included).

Unit V: Geodesic curvature , The Second Fundamental form – Principal Curvature – Lines of Curvature (Dupin'sindicatrix not included).

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	UNIT I - THE THEORY OF SPACE CURVES- Introduction of Space curves
2-L2	Definitions of space curves
3- L3	Arc Length
4-L4	Problems on Arc Length
5-L5	Tangent – unit tangent vector
6-L6	Osculating plane
7-L7	Problems on Osculating plane
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Normal - Unit normal vector –Normal plane
10- L9	Theorems on Osculating plane and Normal plane
11-L10	Curvatures of a curve
12-L11	Behaviour of a curve in the neighbourhood of a point on it.
13-L12	Torsion of a curve
14-L13	Curvature &torsion of a curve given as the intersection of two surfaces.
15-L14	UNITII**:** CONTACT BETWEEN CURVES AND SURFACES - Introduction
16-L15	Osculating Circle and Osculating Sphere
17- L16	Locus of centre of Spherical curvature
18- L17	Tangent surface of a curves
19- L18	Involutes of a curve
20- L19	Evolutes of a curve
21- L20	Helices - **Allotting portion for Internal Test-I**
	Internal Test I beginson 22.01.2018
22- L21	To find the equation of the Involutes
23- IT-1	**Internal Test-I**
24- L22	To find the equation of the Evolutes
25- L23	Definition of circular helices and cylindrical helices
26- L24	Characteristic property of Helices-**Test Paper distribution and result analysis**
27- L25	Circular helix and Cylindrical helix
28- L26	Relation between the curvatures of a general helix and its projection on a plane

	orthogonal to its axis
29- L27	**UNIT III:** DEFINITION OF A SURFACE - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Definition of a curve on a surface
32-L29	Definition Of Parametric Equations – Proper Transformation
33-L30	Equivalent relations of two surfaces
34- L31	Curves on surface
35- L32	Parametric curves and orthogonal to each other
36- L33	Definitions of a Helicoids
37- L34	Right helicoids and General helicoids
38-L35	Definition of Metric
39- L36	Problems on Metric
40- L37	Angle between Parametric curves
41- L38	Elements of area
42-P3	**Department Seminar**
43- L39	Direction coefficients
44- L40	UNIT IV- FAMILIES OF CURVES – Introduction
45- L41	General significance of the sense of the tangent vector
46- L42	Orthogonal trajectories
47- L43	Discuss about the Orthogonal trajectories **Allotting portion for Internal Test-II**
	Internal Test II beginson 26.02.2018
48- L44	Problems on Orthogonal trajectories
49-IT-II	**Internal Test-II**
50-L45	Double family of curves
51- L46	Geodesics - **Test Paper distribution and result analysis**
52- L47	Derivation of equations to Geodesics
53- L48	Problems on Geodesics
54- L49	Problems on Geodesics
55- L50	Canonical geodesics equations
56- L51	Normal property of Geodesics
57- L52	Equivalent statement of the normal property
58- L53	UNIT V- GEODESIC CURVATURE-Introduction
59-P4	**College level meeting/ function**
60- L54	Examples on Geodesic curvature
61- L55	Problems onGeodesic curvature
62- L56	Second Fundamental form
63- L57	Mensniersthrorem
64- L58	Principal Curvature- **Allotting portion for Internal Test-III**
	Internal Test III beginson 01.04.2018
65- L59	Lines of Curvature Rodrigue’s formula
66- L60	Euler’s theorem
67-IT-III	**Internal Test-III**
68- L61	Liouville’s formula
69- L62	Geometrical interpretation of the second fundamental form

70- L63	Classification of point on a surface - **Test Paper distribution and result analysis**
	Model Test begins on 12.04.2018
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Differential Geometry"
CO1	Appreciation and understanding of what makes properties and arguments geometric
CO2	Understanding between intrinsic and extrinsic properties
CO3	Define the equivalence of two curves
CO4	Define surfaces and their properties
CO5	Express tangent spaces of surfaces
Integrated Activity	
IA1	Rigorous treatment to the concepts and methods of differential geometry via the classical theory of curves and surfaces in Euclidean space
IA2	Able to understand the classical theory of curves and surfaces

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Graph Theory
Course Code	PMAM25
Class	I year (2017-2018)
Semester	Even
Staff Name	Mr. Jeshua Rajan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Graph Theory is an integral part of Discrete Mathematics and has applications indiversified areas such as Electrical Engineering, Computer science, Linguistics
- Study the basic concepts of Graph theory such as Trees, connectivity, tour, trail, cycles, etc.
- To understand the ideas of matchings and colourings in graphs and some of its applications

- Illustration on ramsey number of a graph and ramsey's graph with recursion formula to calculate ramsey number
- To explain the concepts of independent number and cliques of a graph and its results

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 07.12.2017
1-L1	Unit I – Acyclic graphs, Tree and edges of tree in terms of vertices
2-L2	Cut edges; Equivalent condition for cut edges
3- L3	Spanning tree and some results on spanning tree
4-L4	Edge cut, bond and cotree
5-L5	Cut vertices; Necessary and sufficient condition for a vertex of a tree to be a cut vertex

6-L6	Edge contraction and recursion formula to find the number of spanning trees
7-L7	Cayley's formula and its proof that is given by Prufer
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Connectivity – its basic definitions and examples
10- L9	Theorem giving relation between edge and vertex connectivities
11-L10	Block of a connected graph
12-L11	Menger's theorem
13-L12	Application on construction of reliable communication networks
14-L13	Harary's theorem on *m*-connected graph
15-L14	Unit II – Tour, trail, walk path and cycle definitions with examples
16-L15	Necessary and sufficient condition for a graph to be an eulerian
17- L16	Necessary and sufficient condition for a connected graph to have an Euler trail
18- L17	Hamilton path and cylces of a graph and examples
19- L18	Necessary condition for a graph to be hamiltonian
20- L19	Dirac's theorem
21- L20	Closure of a graph and some basic results - **Allotting portion for Internal Test-I**
	Internal Test I beginson 22.01.2018
22- L21	Closure property on Hamiltonian graph
23- IT-1	**Internal Test-I**
24- L22	Chvatal's theorem on degree sequences
25- L23	Chvatal's theorem on degree majorized graphs
26- L24	Condition for a simple graph to be a Hamiltonian graph - **Test Paper distribution and result analysis**
27- L25	Application: The Chinese postman problem
28- L26	Fleury's Algorithm
29- L27	Unit III – Matchings and Berge theorem
30- P2	**College level meeting/Cell function**
31-L28	Matchings and coverings in bipartite graphs
32-L29	Hall's theorem on bipartite graph
33-L30	Perfect matching and some results
34- L31	Marriage theorem
35- L32	Theorem on maximum matching and minimum covering
36- L33	Tutte's theorem – necessary and sufficient condition for a graph to have a perfect matching
37- L34	Peterson theorem on 3-regular graph
38- L35	Edge chromatic number: basic definitions and examples
39- L36	Results on edge colouring and chromatic number for bipartite graph
40- L37	Vizing's theorem
41- L38	Vizing's theorem (continuation)

42-P3	**Department Seminar**
43- L39	Unit IV –Independent sets of a graph
44- L40	Necessary and sufficient condition for a subset of the vertex set to be an independent set of the graph
45- L41	Edge independence number and Gallai's theorem
46- L42	Koning's theorem on bipartite graph
47- L43	Clique of a graph and some basic results - **Allotting portion for Internal Test-II**
	Internal Test II beginson 26.02.2018
48- L44	Ramsey numbers and recursion formula on ramsey number
49-IT-II	**Internal Test-II**
50-L45	Illustration of ramsey number using graphs
51- L46	(k, l)-Ramsey graph and results- **Test Paper distribution and result analysis**
52- L47	Erdos theorem on r(k, k)
53- L48	Complete *m*-partite graph on *n*-vertices
54- L49	Turan's theorem
55- L50	Turan's theorem (continuation)
56- L51	Unit V – Vertex colouring: k-vertex colouring of a graph, chromatic number of a graph, illustration
57- L52	Theorem on k-critical graphs
58- L53	Results on critical graphs
59-P4	**College level meeting/ function**
60- L54	Driac's theorem on k-critical graph
61- L55	Brook's theorem
62- L56	Subvision of a graph
63- L57	Remarks on Hajos' conjecture
64- L58	Chromatic polynomials of a graph - **Allotting portion for Internal Test-III**
	Internal Test III beginson 01.04.2018
65- L59	Algorithm to find the chromatic polynomial of a graph
66- L60	Chromatic polynomial of any graph as a linear combination of chromatic polynomials of complete graphs
67-IT-III	**Internal Test-III**
68- L61	Girth and chromatic number
69- L62	Mycielski's theorem
70- L63	Problem discussion on chromatic number and polynomials - **Test Paper distribution and result analysis**
	Model Test begins on 12.04.2018
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**

74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Graph Theory"
CO1	Able to understand the definitions namely, cut vertex, bridge and blocks on a graph
CO2	Study the properties of trees and connectivity
CO3	Identify Eulerian graphs and apply results to identify Hamiltonian graphs
CO4	Understand the concepts Planarity including Euler identity
CO5	Discuss and understand the importance of the concepts Matchings and Colourings
CO6	Able to illustrate the ramsey number of a graph and ramsey's graph with recursion formula which is to calculate ramsey number
CO7	Explain the concepts of independent number and cliques of a graph and its results

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Partial Differential Equation
Course Code	PMAE23
Class	I year (2017-2018)
Semester	Even
Staff Name	Mr. C.Prabu Daniel Pakkianathan
Credits	3

L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Syllabus

Text Book: Elements Of Partial Differential Equations, IAN N. SNEDDON, McGraw Hill, New Delhi,1983.

Unit I: Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$ - 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)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 07-12-2017
1-L1	Introduction
2-L2	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
3- L3	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
4-L4	Solve Integral curves of the equations

5-L5	Integral curves of the equations problems
6-L6	Pfaffian Differential Forms and Equations
7-L7	Pfaffian Differential Forms and Equations
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Solution of Pfaffian Differential Equations in three variables
10- L9	Solution of Pfaffian Differential Equations in three variables
11-L10	Solution of Pfaffian Differential Equations in three variables
12-L11	Discuss Problems on integrable and primitive
13-L12	Partial Differential equations of the first order
14-L13	Partial Differential equations elimination problem
15-L14	Partial Differential equations problems
16-L15	Origins of first order Partial Differential equations
17- L16	General solution of the Differential equations
18- L17	Origins of first order Partial Differential equations
19- L18	Linear equations of the first order
20- L19	Linear equations of the first order
21- L20	Linear equations of the first order - **Allotting portion for Internal Test-I**
	Internal Test I begins on 22-01-2018
22- L21	Linear equations of the first order
23- IT-1	**Internal Test-I**
24- L22	General integrals of the linear Partial Differential equations
25- L23	Integral surfaces passing through a given curve
26- L24	Integral surfaces passing through a given curve - **Test Paper distribution and result analysis**
27- L25	Integral surfaces passing through a given curve
28- L26	Integral surfaces passing through a given curve
29- L27	Integral surfaces passing through a given curve
30- P2	**College level meeting/Cell function**
31-L28	Cauchy's Method of Characteristics
32-L29	Cauchy's Method of Characteristics
33-L30	Cauchy's Method of Characteristics
34- L31	Cauchy's Method of Characteristics
35- L32	Compatible systems of First order Equations
36- L33	Compatible systems of First order Equations
37- L34	Compatible systems of First order Equations
38-L35	Compatible systems of First order Equations
39- L36	Charpit's Method
40- L37	Charpit's Method
41- L38	Solve the complete integrals of the equations problem
42-P3	**Department Seminar**
43- L39	Second order equations in Physics
44- L40	Second order equations in Physics
45- L41	Second order equations in Physics
46- L42	Linear Partial Differential equations with Constant Coefficients
47- L43	Linear Partial Differential equations with Constant Coefficients - **Allotting**

	portion for Internal Test-II
	Internal Test II begins on 26-02-2018
48- L44	Linear Partial Differential equations with Constant Coefficients
49-IT-II	**Internal Test-II**
50-L45	Characteristics of Equations in three variables
51- L46	Characteristics of Equations in three variables - **Test Paper distribution and result analysis**
52- L47	Characteristics of Equations in three variables
53- L48	Characteristics of Equations in three variables
54- L49	Characteristics of Equations in three variables
55- L50	Solved example Problems
56- L51	Exercise Problems
57- L52	Exercise Problems
58- L53	Introduction about Separation of variables
59-P4	**College level meeting/ function**
60- L54	Examples onSeparation of variables
61- L55	Separation of variables problems
62- L56	Separation of variables problems
63- L57	Separation of variables exercise problems
64- L58	Separation of variables exercise problems- **Allotting portion for Internal Test-III**
	Internal Test III begins on 01-04-2018
65- L59	Exercise Problems
66- L60	Problems
67-IT-III	**Internal Test-III**
68- L61	Revision
69- L62	Revision
70- L63	Revision - **Test Paper distribution and result analysis**
71-MT	**Model Test begins on 12-04-2018**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Partial Differential Equation”
CO1	Acquisition of knowledge about Pfaffian Differential Forms and Equations and their Solution in three variables.

CO2	Students will know about Origins of first order Partial Differential equations.
CO3	Knowledge gained about Cauchy's Method of Characteristics and Charpit's Method.
CO4	Learners will know about Second order equations in Physics, Linear Partial Differential equations with Constant Coefficients and Characteristics of Equations in three variables.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc (Mathematics)
Course Name	Algebra - I
Course Code	PMAM11
Class	I year (2017-2018)
Semester	Odd
Staff Name	Mr. Jeshua Rajan
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To understand the concepts on group theory
- To classify the properties in Automorphism and Homomorphism
- To study the various proofs of Sylow's theorems
- To study the properties of finite abelian groups.

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begins on 16.06.2017
1-L1	Unit I – Introduction to group theory: A counting principle
2-L2	Product of two subgroups of a group and its characterisation
3- L3	Finding the order of product of subgroups
4-L4	Finding the order of product of subgroups (Continuation)
5-L5	Cosets, Normal subgroup and basic results
6-L6	Necessary and sufficient condition for a subgroup to be a normal subgroup of the given group
7-L7	Quotient group of a given group by its normal subgroup
8-L8	Order of a quotient group
9-L9	Group homomorphism and examples
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Lemma to define natural homomorphism
12-L11	Kernel of a homomorphism and some results on homomorphisms
13-L12	Proving that the kernel of a homomorphism is a normal subgroup
14-L13	Isomorphism, isomorphic and proving that isomorphic is an equivalence relation
15-L14	First isomorphism theorem on groups
16-L15	simple groups - Cauchy's theorem for Abelian groups
17-L16	Sylow's theorem for Abelian groups
18-L17	Sylow's theorem for Abelian groups continuation
19-L18	Unit II – Automorphism of a group and proving that the set of automorphism is a group
20-L19	The group of inner automorphisms
21-L20	The quotient form of inner automorphims using first isomorphism theorem
22-L21	Relation between order of an element and its image under automorphism
23-L22	Problems on inner automorphism - **Allotting portion for Internal Test-I**
	Internal Test I begins on 31.07.2017
24-L23	Structure of an automorphism of a finite cyclic group
25-L24	Cayley's theorem
26-IT-1	**Internal Test-I**

27-L25	Cayley's theorem continuation
28-L26	Generalization of Cayley's theorem
29-L27	Proof arguments on the generalization of Cayley's theorem
30-L28	Necessary condition for a group cannot be simple - **Test Paper distribution and result analysis**
31- L29	Applications of Cayley's theorem
32- L30	Solvable groups: Solvability of its subgroups and homomorphic images.
33- L31	Product of solvable groups
34-P2	**College level meeting/Cell function**
35- L32	Sequence of subgroups using commutator subgroup of the given group and its solvability
36- L33	Unit III – Permutation Groups : Construction of permutation group on four symbols
37- L34	Equivalence relation on permutation group
38- L35	orbit of an elements under a map and a cycle of a map
39- L36	Proving that every permutation is the product of its cycles
40- L37	Transposition , even / odd permutation and some results
41- L38	Alternating subgroup of a permutation with index two
42- L39	Conjugacy relation and proving that this is an equivalence relation
43- L40	Normalizer of an element in a group and its property
44- L41	Another counting principle using the order of normalizer – Class equation
45- L42	Application of the class equation
46- L43	Necessary condition for the center of a group to be non-trivial
47- L44	Cauchy's theorem
48- L45	Partition of an integer and examples
49- L46	Finding the number of conjugate classes in a permutation groups
50- L47	Illustration of conjugate classes in a permutation groups using a very special and simple case
51- P3	**Department Seminar**
52- L48	Unit IV – Sylow's theorem with Wielandt's proof
53- L49	First proof of Sylow's theorem
54- L50	*p*-Sylow subgroub of a group and Second proof of Sylow's theorem
55- L51	Second proof of Sylow's theorem (Continuation)
56-L52	Third proof of Sylow's theorem - **Allotting portion for Internal Test-II**
	Internal Test II begins on 30.08.2017
57-L53	The number $n(k)$ and its formula
58-L54	An existence of *p*-Sylow subgroup of a symmetric groups
59-IT-II	**Internal Test-II**
60- L55	An equivalence relation between two subgroups in a group
61- L56	Double cosets and order of a double coset- **Test Paper distribution and result analysis**
62- L57	A gut step in the third proof of Sylow's theorem
63- L58	Second part of Sylow's theorem

64- L59	Lemma to prove the third part of Sylow's theorem
65- L60	Third part of Sylow's theorem
66- L61	Application of second and third part of Sylow's theorem
67- L62	Examples on finding (prime)-Sylow subgroups in finite groups
68- L63	Examples on finding (prime)-Sylow subgroups in finite groups
69- L64	Unit V – Cartesian product of two groups and operations upon it
70- L65	External direct product of two groups and a particular normal subgroup.
71- L66	External direct product of any *n* groups
72- L67	Internal direct product of normal subgroups in a group
73- L68	Relation between normal subgroups that are in internal direct product
74-P4	**College level meeting/ function**
75- L69	An isomorphism between the external and internal direct products
76- L70	Fundamental result on finite abelian group as a direct product of cyclic groups
77- L71	Proof arguments on finite abelian group as a direct product of cyclic groups
78- L72	Invariants of an abelian group
79- L73	Definition of G(s) and its property - **Allotting portion for Internal Test-III**
	Internal Test III begins on 03.10.2017
80- L74	Finding the order of G(p^m)
81- L75	Invariants and isomorphisms
82-IT-III	**Internal Test-III**
83- L76	Proving the uniqueness of invariants on isomorphic groups
84- L77	Finding the number of abelian groups of prime power order - **Test Paper distribution and result analysis**
85- L78	Problem discussion on finite abelian groups
	Model Test begins on 19.10.2017
86- MT	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89- L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra - I"
CO1	Student will be able to identify the concept of Normal groups and Quotients groups
CO2	To explain the concepts of solvable groups and its properties

CO3	Student will be able to analyze Permutation groups and Counting principle
CO4	Student will be able to explain Sylow's theorem and its applications
CO5	To discuss about both internal and external products and study various results on finite abelian groups
Experimental Learning	
EL1	Motivated to solve CSIR-NET questions based on group theory

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis I
Course Code	PMAM12
Class	I year (2017-2018)
Semester	Odd
Staff Name	Mrs.P.Gino Metilda
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To define a metric space and analyse certain properties on it, such as, closedness, boundedness, perfect sets, open sets, connected sets etc.
- Describe the compact sets and its characterization

Syllabus

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 – Thenumber 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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16.06.2017
1-L1	Unit – I Metric space, distance functions, its examples
2-L2	Types of intervals, convex. Definitions of neighbourhood, limit point and isolated point
3- L3	Definitions of interior point, open sets, closed sets and perfect sets.
4-L4	Definitions of bounded and unbounded sets, dense subsets in a metric spaces
5-L5	Characterization of the neighbourhood of a limit points; Theorems to describe neighbourhood as open set
6-L6	Complement of a set; Relation between open and closed sets using complement
7-L7	Union and intersection of collection of open or closed sets.
8-L8	Closure of a set; properties of closure of a set in a metric space; and open relative to subspaces
9-L9	Compact sets and compact relative to subspace and whole space
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Characterization of compact sets
12-L11	Definition of k-cell and proving that every k-cell is compact.
13-L12	Heine-Borel theorem, Weierstrass theorem
14-L13	Uncountability property of Perfect sets in R^k
15-L14	The Cantor set – construction of a cantor set and some results on it
16-L15	Defining connected set using separated sets
17-L16	Whole structure of a connected subset of the real line R^1
18-L17	Unit – IISequences, limit point of a sequence, convergent sequence. Range of a sequence and boundedness; some examples
19-L18	Necessary and sufficient condition of a sequence in a metric space to be convergent;
20-L19	Uniqueness of limit; relation between convergent and boundedness; existence of a convergence sequence to a limit point of a set
21-L20	Algebraic operations on convergent sequences
22-L21	Particular sequence in R^k and its convergency and algebraic operations
23-L22	Subsequences; Existence of a convergent subsequence of a sequence in compact space - **Allotting portion for Internal Test-I**
	Internal Test I begins (31.07.2017)
24-L23	Sub-sequential limits of a sequence and its closed property
25-L24	Cauchy sequence, diameter of a sequence; diameter of a closure of a set.
26-IT-1	**Internal Test-I**
27-L25	Relation between convergent and Cauchy sequence; Cauchy criterion for convergence of a sequence
28-L26	Monotonic sequence: monotonic increasing and decreasing; Problems.
29-L27	Convergence of monotonic sequence in terms of boundedness property
30-L28	Upper limit and lower limit of a sequence; Characterization of upper (and lower) limit and some properties - **Test Paper distribution and result analysis**
31- L29	Some special sequence (proof using Squeeze lemma)
32- L30	Series and its sum in terms of sequence of partial sums;

33- L31	Cauchy criterion of a series
34-P2	**College level meeting/Cell function**
35- L32	Comparison test; proof argument and testing convergency of series using comparison test
36- L33	Series of non negative terms; Geometric series, Cauchy's condensation test
37- L34	The number *e* and its properties.
38- L35	Unit – III Root test for series
39- L36	Ratio test for series; examples to check the convergence of a series using root and ratio tests
40- L37	Criticism about the root and ratio test.
41- L38	Power series, coefficients of the power series. Radius of convergence of a power series
42- L39	Examples to find the radius of convergence for given series
43- L40	Summation of parts and convergence of a series that is a product of bounded and decreasing sequence
44- L41	Alternating series; Leibnitz test for convergence for alternating series
45- L42	Absolute convergent and conditionally convergent of a series and relation between them
46- L43	Problems on absolute convergent series and alternating series
47- L44	Addition and multiplication of series; the Cauchy product of two given series
48- L45	Mertens theorem to check the convergence of Cauchy product of series
49- L46	Abel's theorem.
50- L47	Examples on Cauchy product of series
51- P3	**Department Seminar**
52- L48	Unit – IV Limits of functions; and uniqueness
53- L49	Algebraic properties on limits of functions
54- L50	Continuous function at a point and continuous on a space
55- L51	Continuous function and its limits; Continuity of a composition of functions
56-L52	Proving that the inverse image of an open(a closed) set is open(closed)– **Allotting portion for Internal Test-II**
	Internal Test II begins (30.08.2017)
57-L53	Continuous property on functions from any metric space into Euclidean space R^k
58-L54	Continuity and compactness
59-IT-II	**Internal Test-II**
60- L55	Continuous image of a compact set is compact
61- L56	Boundedness of a function, Continuous mapping of a compact space is bounded –**Test Paper distribution and result analysis**
62- L57	Uniformly continuous; Relation between continuity and uniformly continuity
63- L58	Discussion using examples to know the essential of compactness of the domain of a continuous function to become a uniformly continuous
64- L59	Continuity and connectedness; Intermediate value theorem
65- L60	Discontinuities – Left and right limit of a function at a point; Discontinuities of first kind and second kind
66- L61	Problems to check the discontinuities of a function
67- L62	Monotonic functions – monotonically increasing and decreasing;

68- L63	Existence of left and right limits of a monotonic function at every point on intervals
69- L64	Countability of discontinuous point of a monotonic function
70- L65	Unit – V The derivative of a real function
71- L66	Implication between continuity and differentiability of a function
72- L67	Differentiability on algebra of differentiable functions
73- L68	Differentiability of composition of differentiable functions
74-P4	**College level meeting/ function**
75- L69	Examples to know the continuity of first and second derivative of functions
76- L70	Local maximum and local minimum; and its differentiable value
77- L71	Generalized mean value theorem and Mean value theorem
78- L72	Differentiability and monotonicity;
79- L73	Intermediate value theorem - **Allotting portion for Internal Test-III**
	Internal Test III begins (03.10.2017)
80- L74	L'Hospital's rule
81- L75	Problems to test differentiability using L'Hospital's rule
82-IT-III	**Internal Test-III**
83- L76	Derivatives of higher order
84- L77	Taylor's theorem - **Test Paper distribution and result analysis**
85- L78	Problems on Taylor's theorem
	Model test begins (19.10.2017)
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Analysis I"
CO1	After completing this course, the student will be able to: Attain mastery in metric spaces, Perfect sets and Connected sets.
CO2	Locate Sequence and Series comprising convergence sequences, upper and lower limits
CO3	Demonstrate the various tests for convergence in series
CO4	Enumerate the limits of functions, infinite limits and limit at infinity
CO5	Understand, in details, about continuity and uniform continuity of functions
CO6	Define properties of Differentiation
CO7	Study in detail the Mean value theorem and Taylor's theorem

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analytic Number Theory
Course Code	PMAM13
Class	I year (2017-2018)
Semester	Odd
Staff Name	Mrs. T. Santhakumari
Credits	4

L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the fundamental theorem of arithmetic and the Euclidean algorithm
- To explain about various kinds of arithmetical functions and its relations
- To find the averages of arithmetical functions
- To understand the prime number theorem and its equivalent forms as well as to derive some of the asymptotic formulas for certain sums

Syllabus

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).

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2017
1-L1	Unit I – Divisibility and properties of divisibility
2-L2	Greatest common divisor of two integers and a theorem representing the structure of g.c.d.
3- L3	Algebraic properties of greatest common divisor and Euclid's lemma
4-L4	Problem discussion
5-L5	Prime numbers and composite numbers; Euclid's theorem
6-L6	Problems on prime and composite numbers
7-L7	The fundamental theorem of arithmetic
8-L8	Some theorems using factorization
9-L9	The series of reciprocals of the primes
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Exercise problem discussion
12-L11	The division algorithm
13-L12	The Euclidean algorithm
14-L13	Problems to finding the g.c.d. using the Euclidean algorithm
15-L14	The greatest common divisor of more than two numbers
16-L15	Exercise problem discussion
17-L16	Exercise problem discussion
18-L17	Unit II – Introduction to arithmetical functions
19-L18	The mobius function and its result
20-L19	More examples and results in arithmetical functions and mobius function
21-L20	The Euler totient function
22-L21	A relation between mobius and Euler totient function
23-L22	Product formula for Euler totient function - **Allotting portion for Internal Test-I**
	Internal Test I begins on 31.07.2017
24-L23	Further properties of Euler totient function
25-L24	The Dirichlet product of arithmetical functions
26-IT-1	**Internal Test-I**
27-L25	Commuativity and associativity of Dirichlet convolution
28-L26	The identity function
29-L27	Dirichlet inverses and its properties

30-L28	The Mobius inversion formula - **Test Paper distribution and result analysis**
31- L29	The Mangoldt’s function and examples
32- L30	Theorem on Mangoldt’s function
33- L31	Exercise problems discussion
34-P2	**College level meeting/Cell function**
35- L32	Exercise problems discussion
36- L33	Unit III – Multiplicative functions and complete multiplicative functions
37- L34	Theorems on Multiplicative functions
38- L35	Multiplicative functions and Dirichlet multiplication
39- L36	Theorems on Dirichlet product of multiplicative functions
40- L37	Exercise problem discussion
41- L38	The inverse of a completely multiplicative function
42- L39	Liouville’s function and its sum
43- L40	The divisor functions
44- L41	The inverse of the divisor functions
45- L42	Generalized convolutions and its associative property
46- L43	The Generalized inversion formula
47- L44	Problems on Generalized inversion formula
48- L45	Unit IV – An introduction to averages of arithmetical functions
49- L46	The big oh notation and Asymptotic equality of functions
50- L47	The Euler’s summation formula
51- P3	**Department Seminar**
52- L48	Some elementary asymptotic formulas
53- L49	Some elementary asymptotic formulas (continuation)
54- L50	The average order of $d(n)$
55- L51	Dirichlet’s asymptotic formula
56-L52	Deriving the Dirichlet’s asymptotic formula - **Allotting portion for Internal Test-II**
	Internal Test II begins on 30.08.2017
57-L53	The average order of the divisor functions
58-L54	The average order of the Euler totient functions
59-IT-II	**Internal Test-II**
60- L55	An application to the distribution of lattice points visible from the origin
61- L56	Definitions: Mutually visible points - **Test Paper distribution and result analysis**
62- L57	Lattice points - theorem
63- L58	Necessary and sufficient condition for two lattice points to be mutually visible
64- L59	Examples on Lattice points
65- L60	Density of the set of lattice points visible form the origin
66- L61	Average order of mobius and Mangoldt’s function
67- L62	Exercise problem discussion
68- L63	Exercise problem discussion
69- L64	Unit V – The partial sums of a Dirichlet product
70- L65	Application to mobius and Mangoldt’s function
71- L66	The Legendre’s identity

72- L67	Theorem to determine an asymptotic formula for $log[x]!$
73- L68	Elementary theorems on the distribution of Prime numbers
74-P4	**College level meeting/ function**
75- L69	Chebyshev's psi-function
76- L70	Chebyshev's theta-function
77- L71	Inequality on difference of Chebyshev's functions
78- L72	Relations connecting Chebyshev's functions
79- L73	Abel's identity - **Allotting portion for Internal Test-III**
	Internal Test III begins on 03.10.2017
80- L74	Expression of Chebyshev's functions in terms of integrals
81- L75	Equivalent forms of the prime number theorem
82-IT-III	**Internal Test-III**
83- L76	Equivalent forms of the prime number theorem (continuation)
84- L77	Inequalities for $\pi(n)$- **Test Paper distribution and result analysis**
85- L78	Inequalities for p_n
	Model Test begins on 19.10.2017
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Analytic Number Theory"
CO1	After completing this course, the student will be able to Understand the concepts of divisibility and Primes.
CO2	To explain about various kinds of arithmetical functions and the relation among them
CO3	Able to calculate the averages of several arithmetical functions
CO4	To understand the prime number theorem and its equivalent forms
CO5	To derive some of the asymptotic formulas for certain sums

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Ordinary Differential Equation
Course Code	PMAM14
Class	I year (2017-2019)
Semester	Odd
Staff Name	Mr. C.PRABU DANIEL PAKKIANATHAN
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 16-6-2017
1-L1	Introduction
2-L2	Second Order linear equations
3- L3	General solution of the Homogeneous equations
4-L4	General solution of the Homogeneous equations
5-L5	General solution of the Homogeneous equations
6-L6	The use of a known solution to find another
7-L7	The use of a known solution to find another
8-L8	The use of a known solution to find another
9-L9	The method of variation of parameters
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	The method of variation of parameters
12-L11	The method of variation of parameters
13-L12	The method of variation of parameters
14-L13	Power series solutions
15-L14	Power series solutions
16-L15	A review of power series solutions
17-L16	A review of power series solutions
18-L17	A review of power series solutions
19-L18	Series solution of first order equations
20-L19	Series solution of first order equations
21-L20	Series solution of first order equations
22-L21	Series solution of first order equations
23-L22	Series solution of first order equations - **Allotting portion for Internal Test-I**
	Internal Test I begins on 31-7-2017
24-L23	Second order equations
25-L24	Second order equations
26-IT-1	**Internal Test-I**
27-L25	Second order equations
28-L26	Ordinary points
29-L27	Ordinary points
30-L28	Ordinary points- **Test Paper distribution and result analysis**
31- L29	Ordinary points
32- L30	Regular singular points
33- L31	Regular singular points
34-P2	**College level meeting/Cell function**
35- L32	Regular singular points
36- L33	Regular singular points
37- L34	Legendre polynomials

38- L35	Legendre polynomials
39- L36	Legendre polynomials
40- L37	Properties of Legendre Polynomials
41- L38	Properties of Legendre Polynomials
42- L39	Properties of Legendre Polynomials
43- L40	Bessel functions
44- L41	Bessel functions
45- L42	Bessel functions
46- L43	Bessel functions
47- L44	The Gamma functions
48- L45	The Gamma functions
49- L46	The Gamma functions
50- L47	The Gamma functions
51- P3	**Department Seminar**
52- L48	Properties of Bessel functions
53- L49	Properties of Bessel functions
54- L50	Properties of Bessel functions
55- L51	Properties of Bessel functions
56-L52	Properties of Bessel functions- **Allotting portion for Internal Test-II**
	Internal Test II begins on 30-08-2017
57-L53	Linear systems
58-L54	Linear systems
59-IT-II	**Internal Test-II**
60- L55	Linear systems
61- L56	Linear systems- **Test Paper distribution and result analysis**
62- L57	Linear systems
63- L58	Linear systems
64- L59	Problems
65- L60	Problems
66- L61	Problems
67- L62	Problems
68- L63	Homogeneous linear systems with constant coefficients
69- L64	Homogeneous linear systems with constant coefficients
70- L65	Homogeneous linear systems with constant coefficients
71- L66	Homogeneous linear systems with constant coefficients
72- L67	Homogeneous linear systems with constant coefficients
73- L68	Homogeneous linear systems with constant coefficients
74-P4	**College level meeting/ function**
75- L69	Homogeneous linear systems with constant coefficients
76- L70	Homogeneous linear systems with constant coefficients
77- L71	Homogeneous linear systems with constant coefficients
78- L72	Problem discussion
79- L73	Problem discussion- **Allotting portion for Internal Test-III**
	Internal Test III begins on 03-10-2017
80- L74	Problem discussion

81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	Problem discussion- **Test Paper distribution and result analysis**
85- L78	Revision
86- L79	**Model Testbegins on 19-10-2017**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Ordinary Differential Equation''
CO1	Students will be able to find the complete solution of a differential equationwith constant coefficients by variation of parameters.
CO2	Knowledge gained about Second Order linear equations and Power series solutions.
CO3	Acquisition of knowledge about Legendre polynomials, Bessel functions, The Gamma functions and Linear systems.
CO4	Students will have a working knowledge of basic application problem described by second order linear differential equations with constant coefficients.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2017-2018)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Numerical Analysis
Course Code	PMAM15
Class	I year(2017-2018)
Semester	Odd
Staff Name	1. Mr. Jeshua Rajan 2. Mr. C. Prabu Daniel Pakkianathan 3. Mrs. T. Santhakumari
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

Numerical Analysis deals with numerical solutions of certain problems of Mathematics. In this course we study iterative methods to solve nonlinear equations in one variable, methods to solve system of equations, interpolation problems and Numerical solutions of differential equations.

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 16.06.2017
1-L1	Unit I – Introduction to interpolation
2-L2	Newton's forward interpolation formula – Algorithm
3- L3	Problem discussion on Newton's forward interpolation formula
4-L4	Newton's backward interpolation formula
5-L5	Problem discussion on Newton's backward interpolation formula
6-L6	Central Difference Interpolation Formula
7-L7	Gauss forward interpolation formula

8-L8	Gauss backward interpolation formula
9-L9	Stirling's formula
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Bessel's Formula
12-L11	Laplace-Everett's formula
13-L12	Lagrange's interpolation formula
14-L13	Problems on Lagrange's interpolation formula
15-L14	Divided differences formulae; relation between divided differences and forward differences
16-L15	Newton's Divided differences formula
17-L16	Inverse interpolations: Lagrange's method, iterative method
18-L17	Hermite's Interpolating polynomial
19-L18	Unit II – Numerical differentiation: an introduction
20-L19	Derivatives using Newton's forward difference formula
21-L20	Derivatives using Newton's forward difference formula
22-L21	Problems to find derivatives using Newton's forward difference formula
23-L22	Problem discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins on 31.07.2017
24-L23	Problems to find derivatives using Newton's forward difference formula
25-L24	Problems to find derivatives using Newton's forward difference formula
26-IT-1	**Internal Test-I**
27-L25	Derivatives using Newton's backward difference formula
28-L26	Derivatives using Newton's backward difference formula
29-L27	Problems to find derivatives using Newton's backward difference formula
30-L28	Derivatives using central difference formulae (Stirling's formula) - **Test Paper distribution and result analysis**
31- L29	Algorithm on derivatives using Stirling's formula
32- L30	Problems to find derivatives using Stirling's formula
33- L31	Maxima and minima of the interpolating polynomial
34-P2	**College level meeting/Cell function**
35- L32	Problems in maxima and minima of the interpolating polynomial
36- L33	Unit III – Introduction to Numerical integration
37- L34	Newton-Cote's quadrature formula
38- L35	Trapezoidal Rule
39- L36	Geometrical interpretation of Trapezoidal rule and Error in Trapezoidal rule
40- L37	Simpson's one third rule: Algorithm
41- L38	Finding truncation error in Simpson's formula
42- L39	Simpson's three eight rule: Algorithm
43- L40	Weddle's rule
44- L41	Romberg's method
45- L42	Problems on numerical integration
46- L43	Two-point Gaussian Quadrature formulae
47- L44	Gaussian three-point quadrature formula
48- L45	Trapezoidal rule for double integrals
49- L46	Simpson's one-third rule for double integrals

50- L47	Problems solving for double integrals
51- P3	**Department Seminar**
52- L48	Unit IV – Introduction to numerical solutions of ordinary differential equations
53- L49	Taylor's series method: Algorithm
54- L50	Problems on Taylors's series method
55- L51	Picard's iteration method
56-L52	Problems using Picard's iteration method – **Allotting portion for Internal Test-II**
	Internal Test II begins on 30.08.2017
57-L53	Euler's algorithm
58-L54	Problems using Euler's method
59-IT-II	**Internal Test-II**
60- L55	Modified Euler's method
61- L56	Solving problems and comparing the difference in Euler's and Modified Euler's method **- Test Paper distribution and result analysis**
62- L57	Runge-Kutta method
63- L58	First order and second order Runge-Kutta method
64- L59	Problem discussion
65- L60	Third order and fourth order Runge-Kutta method
66- L61	Problems on Third order Runge-Kutta method
67- L62	Fourth order Runge-Kutta method
68- L63	Problems on fourth order Runge-Kutta method
69- L64	Unit V – Predictor corrector methods: introduction
70- L65	Milne's predictor method
71- L66	Problems using Milne's predictor method
72- L67	Milne's Corrector method
73- L68	Problems using Milne's corrector method
74-P4	**College level meeting/ function**
75- L69	Problem discussion on Milne's method
76- L70	Problem discussion on Milne's method
77- L71	Adams-Bashforth method: an introduction
78- L72	Adams-Bashforth predictor formula
79- L73	Problems using Adams-Bashforth predictor formula **- Allotting portion for Internal Test-III**
	Internal Test III begins on 03.10.2017
80- L74	Adams-Bashforth corrector formula
81- L75	Problems using Adams-Bashforth predictor formula
82-IT-III	**Internal Test-III**
83- L76	Problems using Adams-Bashforth method
84- L77	Problems discussion **- Test Paper distribution and result analysis**
85- L78	Problems using Adams-Bashforth method
	Model Test begins on 19.10.2017
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**

89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 06.11.2017

Course Outcomes

Learning Outcomes	**COs** of the course "Numerical Analysis"
CO1	Demonstrate understanding of common numerical methods and used to obtain approximate solutions to otherwise intractable mathematical problems
CO2	Analyse and evaluate the accuracy of common numerical methods
CO3	Compare different algorithms with respect to accuracy and efficiency solution
CO4	Analyse the errors obtained in the numerical solution of problems
CO5	Using appropriate numerical methods , determine the solutions to given non linear equations
CO6	Using appropriate numerical methods , determine approximate solutions to ordinary differential solutions
Integrated Activity	
IA1	Determine approximate numerical solutions to mathematical problems which can not always be solved by conventional analytical techniques
IA2	Demonstrate the important of selecting the right numerical technique for a particular application.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Algebra II
Course Code	PMAM21
Class	I year (2018-2019)
Semester	Even

Staff Name	Mr. Jeshua Rajan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To understand the concepts on ring theory
- To classify the properties in Euclidean rings and Principal ideal rings
- To explain about the polynomial rings over some specific spaces
- To study the various types of radicals and direct sum of rings

Syllabus

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**

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03.12.2018
1-L1	Unit I – Introduction to ring and ring homomorphism
2-L2	Kernel of a ring homomorphism and results on it.
3- L3	Examples to explain ring homomorphism and its kernel; definition of Isomorphism
4-L4	Ideal of a ring and examples
5-L5	Illustration of Quotient ring and its homomorphic image
6-L6	Necessary condition for a commutative ring to become a field
7-L7	Maximal ideals; the structure of maximal ideals of the ring of integers
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Necessary and sufficient condition for an ideal of a commutative ring to be a maximal ideal
10- L9	Imbedding a ring into another ring
11-L10	Every integral domain can be imbedded in a field – Proof discussion
12-L11	Every integral domain can be imbedded in a field – Proof discussion (contd.)
13-L12	The field of Quotients of an integral domain
14-L13	Unit II – Integral domain, zero divisors, and Euclidean ring
15-L14	Characterization of ideals in a Euclidean ring
16-L15	Definition of Principal ideal ring and implications between Euclidean ring and Principal ideal ring
17- L16	Definition of 'divide' and some results on it
18- L17	greatest common divisor of two elements and its general form in a Euclidean ring
19- L18	'Units' in a commutative ring and some properties
20- L19	Associate elements in a commutative ring and d-value of non-unit elements
21- L20	Prime element in a Euclidean ring and expression of every elements in prime factors - **Allotting portion for Internal Test-I**
	Internal Test I begins (18.01.2019)
22- L21	Relatively prime and its property in a Euclidean ring
23- IT-1	**Internal Test-I**
24- L22	Unique Factorization theorem
25- L23	Necessary and sufficient condition for the generating element of an ideal in a Euclidean ring R to be a prime element of R
26- L24	The particular Euclidean ring J[i] - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Basic lemmas to prove Fermat theorem

28- L26	Proof of Fermat theorem
29- L27	Unit III – The Polynomial ring F[x] over a field. Defining the equality, sum, product of polynomials
30- P2	**College level meeting/Cell function**
31-L28	Degree of a polynomial and finding the degree of the product of two or more polynomials
32-L29	The Division Algorithm in a polynomial ring
33-L30	Irreducible polynomials over the field and the structure of maximal ideals in polynomial ring
34- L31	Primitive polynomials and its property
35- L32	Content of a polynomial and Gauss' Lemma
36- L33	Integer monic polynomials and The Eisenstein Criterion
37- L34	The polynomial rings over a commutative ring
38- L35	Definition of Unique factorization domain (UFD)
39- L36	The existence of greatest common divisor of any two elements in a UFD
40- L37	Content, primitive concepts in the polynomial rings over a commutative ring
41- L38	Unique factorization of primitive polynomial in R[x] if R is UFD
42-P3	**Department Seminar**
43- L39	The implication of unique factorization domain between R and R[x]
44- L40	Unit IV – Jacobson radical of a ring (rad R); semi-simple ring
45- L41	Finding rad R for some rings, namely ring of integers, C[0,1] and ring of formal power series
46- L42	Structure of an ideal that is subset of the Jacobson radical
47- L43	Corollaries to discuss about idempotent element, nil ideal, invertible elements using 'rad R'. - **Allotting portion for Internal Test-II**
	Internal Test II begins (25.02.2019)
48- L44	Proving that the quotient ring R/rad R is semi-simple.
49-IT-II	**Internal Test-II**
50-L45	Expressing the Jacobson radical of a quotient ring R/I as a function of the radical of R.
51- L46	Necessary and sufficient condition for that a principal ideal domain to be semi-simple; and its consequences. - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Prime radical of a ring 'Rad R' and its results
53- L48	Nil radical of an ideal in a ring
54- L49	Relation between the Jacobson and nil radical in the ring of polynomials R[x]
55- L50	Idempotent of a quotient ring can be raised or lifted into the ring – Definition and its results
56- L51	Unit V – Quasi-regular elements in a ring; existence of quasi-regular elements and quasi-inverse
57- L52	The 'circle operation' of Perlis; and some results under circle operation
58- L53	*J*-radical J(R) of a ring and *J*-semisimple ring – Definitions, examples
59-P4	**College level meeting/ function**
60- L54	Claiming that the *J*-radical is an ideal of the ring
61- L55	Proving that the quotient ring R/J(R) is *J*-semisimple.

62- L56	Complete direct sum of the collection of rings
63- L57	Discrete direct sum of the collection of rings and ith component projections
64- L58	Subdirect sum. Structure of a ring that is isomorphic to a subdirect sum of a collection of rings –**Allotting portion for Internal Test-III**
	Internal Test III begins (22.03.2019)
65- L59	Some examples and theorems under subdirect sum
66- L60	A necessary condition of a ring which is prerequisite to study Artinian rings
67-IT-III	**Internal Test-III**
68- L61	Chinese Remainder Theorem and definition of 'sub-directly irreducible'
69- L62	Birkhoff theorem – Proof discussion
70- L63	Heart of a ring and McCoy theorem - **Test Paper distribution and result analysis**
	Model Test begins (08.04.2019)
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra II"
CO1	After studying this course, Students can have a better ability to explain about ring and ring homomorphism.
CO2	Illustrate about ideals and some special kind of ideals
CO3	Classify the properties in Euclidean rings and Principal ideal rings
CO4	Ability to solve problems in Euclidean rings and its particular rings
CO5	Can explain about certain radicals of a ring, such as, Jacobson radical, nil radical, prime radical and *J*-radical.
CO6	Classify the difference between complete direct sums, discrete direct sums, subdirect sums
Experimental Learning	
EL1	Differentiate the types of rings graphically
EL2	Classifications on certain radicals of a ring
EL3	The defining manner of Euclidean ring is demonstrating as an generalization of ring of integers
EL4	Motivated to solve CSIR-NET questions based on ring theory

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis II
Course Code	PMAM22
Class	I year (2018-2019)
Semester	Even
Staff Name	Mrs. P. Gino Metilda
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Understanding the concept of Riemann Integral.
- Gain Knowledge about Uniform convergence
- Understanding the concept of Power series, Fourier series
- Gain Knowledge of Gamma functions

Syllabus

2.2 Paper 7: ANALYSISII

Text Book: Principles of Mathematical Analysis, Third Edition, Walter Rudin – McGraw Hill International BookCompany.

UnitI: Definition and Properties of Integral – Integration andDifferentiation.

Chapter 6: Section: 6.1 – 6.22.

Exercise Problems: Chapter 6: 1, 2, 4, 5, 10, 11.

UnitII: Integration of vector valued functions – Rectifiable arcs, Sequence and Series of functions: Discussion of main problem – Uniform Convergence – Uniform Convergence andContinuity.
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.

UnitIV: The Stone Weierstrass Theorem - PowerSeries.
Chapter 7: Section: 7.26– 7.33 and **Chapter 8:** Section: 8.1 – 8.5.

Exercise Problems: Chapter 8: 1 – 5.

UnitV: 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.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03.12.2018
1-L1	Unit I Definition of Riemann Integral and examples
2-L2	Theorems in Riemann Integral
3- L3	Theorems in Riemann Integral
4-L4	Properties of the Integral
5-L5	The fundamental theorem of calculas
6-L6	Theorem of Integration by parts
7-L7	Theorems in Riemann Integral
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Theorems in Riemann Integral
10- L9	Introduction of vector valued functions
11-L10	Theorems in vector valued functions
12-L11	Theorems in vector valued functions
13-L12	Definition of rectifiable curve and theorems

14-L13	Theorems in rectifiable curve
15-L14	Unit II Definition of convergent sequence and convergent series with examples
16-L15	Theorems in convergent sequence and convergent series
17- L16	Theorems in convergent sequence and convergent series
18- L17	Problems in convergent sequence and convergent series
19- L18	Problems in convergent sequence and convergent series
20- L19	Definition of Uniform convergence and examples
21- L20	Riemann Integral to convergent sequence - **Allotting portion for Internal Test-I**
	Internal Test I begins on 18.01.2019
22- L21	Cauchy criterion theorem
23- IT-1	**Internal Test-I**
24- L22	Wierestrass theorem
25- L23	Theorems in Uniform convergent sequence
26- L24	Theorems in Uniform convergent sequence - **Test Paper distribution and result analysis**
27- L25	Theorems in Uniform convergent sequence
28- L26	Problems in Uniform convergent sequence
29- L27	Unit III Definition of Integrations and examples
30- P2	**College level meeting/Cell function**
31-L28	Theorems in Integrations
32-L29	Theorems in Integrations
33-L30	Theorems in Integrations
34- L31	Theorems in Integrations
35- L32	Problems in Integrations
36- L33	Problems in Integrations
37- L34	Theorems in Equicontinuous
38- L35	Theorems in Equicontinuous
39- L36	Theorems in Equicontinuous
40- L37	Theorems in Equicontinuous
41- L38	Problems in Equicontinuous
42-P3	**Department Seminar**
43- L39	Equicontinuous
44- L40	Unit IV The stone wierestrass theorem
45- L41	The stone wierestrass theorem
46- L42	Definition of algebra, Uniform closure and examples
47- L43	Cauchy criterian theorem toEquicontinous - **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
48- L44	Theorems in algebra and Uniform closure
49-IT-II	**Internal Test-II**
50-L45	Theorems in algebra and Uniform closure
51- L46	Theorems in algebra - **Test Paper distribution and result analysis**
52- L47	Theorems in algebra and Uniform closure
53- L48	Theorems in algebra and Uniform closure

54- L49	Stone generalisation theorem
55- L50	Introduction in Power series and theorems
56- L51	Theorems in Power series
57- L52	Taylors theorem
58- L53	Unit V Introduction to The algebraic completeness of the complex field
59-P4	**College level meeting/ function**
60- L54	Theorems in the algebraic completeness of the complex field
61- L55	Definition of Fourier series and theorems
62- L56	Definition of orthonormal and orthogonal and theorems
63- L57	Parsevels Theorem
64- L58	Stone wierestrass theorem to Parsevels theorem- **Allotting portion for Internal Test-III**
	Internal Test III begins on 22.03.2019
65- L59	Introduction to gamma function and theorem
66- L60	Some results in gamma functions
67-IT-III	**Internal Test-III**
68- L61	Some results in gamma functions
69- L62	Stirling formula
70- L63	Stirling formula - **Test Paper distribution and result analysis**
	Model Test begins on 08.04.2019
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Analysis II"
CO1	Describes fundamental properties of Riemann Integral
CO2	Solved Problems in Riemann Integral
CO3	Describes the Properties in Power series
CO4	Solving the problems using Power series

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Classical Mechanics
Course Code	PMAM23
Class	I year (2018-2019)
Semester	Even
Staff Name	Mrs. T. Santhakumari
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To study mechanical systems under generalized coordinate systems, virtual work, energy and momentum
- To study mechanics developed by Newton, Langrange, Hamilton and Jacobi

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begins on 03.12.2018
1-L1	Unit I – Introduction: Mechanics of a single particle
2-L2	Conservation theorem for linear momentum of a single particle
3- L3	Conservation theorem for angular momentum of a single particle
4-L4	Some remarks on conservation theorems
5-L5	Energy conservation theorem
6-L6	Problem discussion on mechanics of a single particle
7-L7	Mechanics of a system of particles
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Conservation theorem for linear momentum of a system of particles
10- L9	Conservation theorem for angular momentum of a system of particles
11-L10	Theorems on Kinetic energy
12-L11	Problem discussion on Kinetic energy
13-L12	Energy conservation theorem
14-L13	Exercise problems using conservation theorem
15-L14	Unit II – Constraints: Different types of constraints
16-L15	Examples for holonomic constraints and non-holonomic constraints
17- L16	Virtual work and D'Alembert's Principle
18- L17	Lagrange's equation from D'Alembert's Principle – Theorem
19- L18	Lagrange's equation for non-holonomic constraints
20- L19	Velocity dependent potentials
21- L20	Rayleigh Dissipation function –**Allotting portion for Internal Test-I**
	Internal Test I begins on 18.01.2019
22- L21	Lagrangian for charged particle and some problems
23- IT-1	**Internal Test-I**
24- L22	Applications of the Lagrangian equation
25- L23	Lagrangian for a single particle (i) in cartesian coordinates (ii) in polar coordinates
26- L24	Lagrangian for Atwood machine - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Time dependent potential
28- L26	Problem - bead sliding on rotating wire and some exercise problems
29- L27	Unit III – Variation principles and lagrange's equation - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Hamilton's principle
32-L29	Stationary values
33-L30	Path of a system – congugration
34- L31	Path of a system – congugration

35- L32	Techniques of calculus of variation - theorem
36- L33	Lagrange’s equation from Hamilton’s principle
37- L34	Shortest distance between two point in a space
38- L35	Minimum surface of revolution
39- L36	Brachistochrone problem
40- L37	Extension of Hanilton’s Principle
41- L38	Extension of Hanilton’s Principle non-holonomic system
42-P3	**Department Seminar**
43- L39	Unit IV –Two body central force problem
44- L40	Reduction to one body problem
45- L41	The equations of motion and first integral theorem
46- L42	The Kepler’s Second law of planetary motion
47- L43	Derivatives - **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
48- L44	Illustrations about derivative and motion
49-IT-II	**Internal Test-II**
50-L45	The equivalent one dimensional problems
51- L46	Classification of orbits - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Examples of the method occurs for a linear restoring force
53- L48	Inverse square law for circular orbits
54- L49	The virial theorem.
55- L50	Problem discussion based on the virial’s theorem
56- L51	Unit V – The differential equation for the orbit
57- L52	Problems on differential equation for the orbit
58- L53	Integrable power-law potentials
59-P4	**College level meeting/ function**
60- L54	The Kepler problem
61- L55	Inverse square law of force
62- L56	Nature of the orbit depends on e and E
63- L57	The motion in time in the Kepler problem
64- L58	Deriving the approximate version of the Kepler’s third law – **Allotting portion for Internal Test-III**
	Internal Test III begins on 22.03.2019
65- L59	Existence of conserved vector **A** for the Kepler problem
66- L60	The Laplace-Runge-Lenz vector
67-IT-III	**Internal Test-III**
68- L61	Problem discussion
69- L62	Scattering in a central force field
70- L63	Relation of orbit parameters and scattering angle - **Test Paper distribution and**

	result analysis
	Entering Internal Test-III Marks into University portal
	Model Test begins on 08.04.2019
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Classical Mechanics"
CO1	Able to understand D' Alembert's Principle and simple applications of the Lagrangian Formulation.
CO2	Able to analyze the Derivation of Lagrange's Equations from Hamilton's Principle and Extension of Hamilton's Principle to Non-holonomic Systems
CO3	Able to study the concept of the Equations of Motion and the Equivalent One-Dimensional Problems.
CO4	Able to understand the Kepler Problem and Inverse-Square Law of Force.
CO5	Able to distinguish the concept of the Hamilton Equations of Motion and the Principle of Least Action.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics

Course Name	Classical Mechanics
Course Code	PMAM23
Class	I year (2018-2019)
Semester	Even
Staff Name	Mrs. T. Santhakumari
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To study mechanical systems under generalized coordinate systems, virtual work, energy and momentum
- To study mechanics developed by Newton, Langrange, Hamilton and Jacobi

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begins on 03.12.2018
1-L1	Unit I – Introduction: Mechanics of a single particle
2-L2	Conservation theorem for linear momentum of a single particle
3- L3	Conservation theorem for angular momentum of a single particle
4-L4	Some remarks on conservation theorems
5-L5	Energy conservation theorem
6-L6	Problem discussion on mechanics of a single particle
7-L7	Mechanics of a system of particles
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Conservation theorem for linear momentum of a system of particles
10- L9	Conservation theorem for angular momentum of a system of particles
11-L10	Theorems on Kinetic energy
12-L11	Problem discussion on Kinetic energy
13-L12	Energy conservation theorem
14-L13	Exercise problems using conservation theorem
15-L14	Unit II – Constraints: Different types of constraints
16-L15	Examples for holonomic constraints and non-holonomic constraints
17- L16	Virtual work and D’Alembert’s Principle
18- L17	Lagrange’s equation from D’Alembert’s Principle – Theorem
19- L18	Lagrange’s equation for non-holonomic constraints
20- L19	Velocity dependent potentials
21- L20	Rayleigh Dissipation function –**Allotting portion for Internal Test-I**
	Internal Test I begins on 18.01.2019
22- L21	Lagrangian for charged particle and some problems

23- IT-1	**Internal Test-I**
24- L22	Applications of the Lagrangian equation
25- L23	Lagrangian for a single particle (i) in cartesian coordinates (ii) in polar coordinates
26- L24	Lagrangian for Atwood machine - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Time dependent potential
28- L26	Problem - bead sliding on rotating wire and some exercise problems
29- L27	Unit III – Variation principles and lagrange's equation - Introduction
30- P2	**College level meeting/Cell function**
31-L28	Hamilton's principle
32-L29	Stationary values
33-L30	Path of a system – congugration
34- L31	Path of a system – congugration
35- L32	Techniques of calculus of variation - theorem
36- L33	Lagrange's equation from Hamilton's principle
37- L34	Shortest distance between two point in a space
38- L35	Minimum surface of revolution
39- L36	Brachistochrone problem
40- L37	Extension of Hanilton's Principle
41- L38	Extension of Hanilton's Principle non-holonomic system
42-P3	**Department Seminar**
43- L39	Unit IV –Two body central force problem
44- L40	Reduction to one body problem
45- L41	The equations of motion and first integral theorem
46- L42	The Kepler's Second law of planetary motion
47- L43	Derivatives - **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
48- L44	Illustrations about derivative and motion
49-IT-II	**Internal Test-II**
50-L45	The equivalent one dimensional problems
51- L46	Classification of orbits - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Examples of the method occurs for a linear restoring force
53- L48	Inverse square law for circular orbits
54- L49	The virial theorem.
55- L50	Problem discussion based on the virial's theorem
56- L51	Unit V – The differential equation for the orbit
57- L52	Problems on differential equation for the orbit
58- L53	Integrable power-law potentials

59-P4	**College level meeting/ function**
60- L54	The Kepler problem
61- L55	Inverse square law of force
62- L56	Nature of the orbit depends on *e* and *E*
63- L57	The motion in time in the Kepler problem
64- L58	Deriving the approximate version of the Kepler's third law – **Allotting portion for Internal Test-III**
	Internal Test III begins on 22.03.2019
65- L59	Existence of conserved vector **A** for the Kepler problem
66- L60	The Laplace-Runge-Lenz vector
67-IT-III	**Internal Test-III**
68- L61	Problem discussion
69- L62	Scattering in a central force field
70- L63	Relation of orbit parameters and scattering angle - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 08.04.2019
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Classical Mechanics"
CO1	Able to understand D' Alembert's Principle and simple applications of the Lagrangian Formulation.
CO2	Able to analyze the Derivation of Lagrange's Equations from Hamilton's Principle and Extension of Hamilton's Principle to Non-holonomic Systems
CO3	Able to study the concept of the Equations of Motion and the Equivalent One-Dimensional Problems.
CO4	Able to understand the Kepler Problem and Inverse-Square Law of Force.
CO5	Able to distinguish the concept of the Hamilton Equations of Motion and the Principle of Least Action.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Partial Differential Equation
Course Code	PMAE23
Class	I year (2018-2019)
Semester	Even
Staff Name	Mr. C. Prabu Daniel Pakkianathan
Credits	3
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65Hrs (5 units; 5×13=65; 13Hrs /unit)	

Syllabus

Text Book: Elements Of Partial Differential Equations, IAN N. SNEDDON, McGraw Hill, New Delhi,1983.

Unit I: Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$ - 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)

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03-12-2018
1-L1	Introduction
2-L2	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
3- L3	Methods of Solution of $\frac{dx}{p}+\frac{dy}{Q}+\frac{dx}{R}$
4-L4	Solve Integral curves of the equations
5-L5	Integral curves of the equations problems
6-L6	Pfaffian Differential Forms and Equations
7-L7	Pfaffian Differential Forms and Equations
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Solution of Pfaffian Differential Equations in three variables
10- L9	Solution of Pfaffian Differential Equations in three variables
11-L10	Solution of Pfaffian Differential Equations in three variables
12-L11	Discuss Problems on integrable and primitive
13-L12	Partial Differential equations of the first order
14-L13	Partial Differential equations elimination problem
15-L14	Partial Differential equations problems
16-L15	Origins of first order Partial Differential equations
17- L16	General solution of the Differential equations
18- L17	Origins of first order Partial Differential equations
19- L18	Linear equations of the first order
20- L19	Linear equations of the first order
21- L20	Linear equations of the first order - **Allotting portion for Internal Test-I**
	Internal Test I begins on 18-01-2019
22- L21	Linear equations of the first order
23- IT-1	**Internal Test-I**
24- L22	General integrals of the linear Partial Differential equations
25- L23	Integral surfaces passing through a given curve
26- L24	Integral surfaces passing through a given curve- **Test Paper distribution and**

	result analysis
	Entering Internal Test-I Marks into University portal
27- L25	Integral surfaces passing through a given curve
28- L26	Integral surfaces passing through a given curve
29- L27	Integral surfaces passing through a given curve
30- P2	**College level meeting/Cell function**
31-L28	Cauchy's Method of Characteristics
32-L29	Cauchy's Method of Characteristics
33-L30	Cauchy's Method of Characteristics
34- L31	Cauchy's Method of Characteristics
35- L32	Compatible systems of First order Equations
36- L33	Compatible systems of First order Equations
37- L34	Compatible systems of First order Equations
38-L35	Compatible systems of First order Equations
39- L36	Charpit's Method
40- L37	Charpit's Method
41- L38	Solve the complete integrals of the equations problem
42-P3	**Department Seminar**
43- L39	Second order equations in Physics
44- L40	Second order equations in Physics
45- L41	Second order equations in Physics
46- L42	Linear Partial Differential equations with Constant Coefficients
47- L43	Linear Partial Differential equations with Constant Coefficients- **Allotting portion for Internal Test-II**
	Internal Test II begins on 25-02-2019
48- L44	Linear Partial Differential equations with Constant Coefficients
49-IT-II	**Internal Test-II**
50-L45	Characteristics of Equations in three variables
51- L46	Characteristics of Equations in three variables- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Characteristics of Equations in three variables
53- L48	Characteristics of Equations in three variables
54- L49	Characteristics of Equations in three variables
55- L50	Solved example Problems
56- L51	Exercise Problems
57- L52	Exercise Problems
58- L53	Introduction about Separation of variables
59-P4	**College level meeting/ function**
60- L54	Examples onSeparation of variables
61- L55	Separation of variables problems
62- L56	Separation of variables problems
63- L57	Separation of variables exercise problems
64- L58	Separation of variables exercise problems- **Allotting portion for Internal Test-**

	III
	Internal Test III begins on 22-03-2019
65- L59	Exercise Problems
66- L60	Problems
67-IT-III	**Internal Test-III**
68- L61	Revision
69- L62	Revision
70- L63	Revision- **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test begins on 08-04-2019**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course "Partial Differential Equation"
CO1	Acquisition of knowledge about Pfaffian Differential Forms and Equations and their Solution in three variables.
CO2	Students will know about Origins of first order Partial Differential equations.
CO3	Knowledge gained about Cauchy's Method of Characteristics and Charpit's Method.
CO4	Learners will know about Second order equations in Physics, Linear Partial Differential equations with Constant Coefficients and Characteristics of Equations in three variables.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Graph Theory
Course Code	PMAM25
Class	I year (2018-2019)
Semester	Even
Staff Name	Mr. R. Arul Ananthan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Graph Theory is an integral part of Discrete Mathematics and has applications indiversified areas such as Electrical Engineering, Computer science, Linguistics
- Study the basic concepts of Graph theory such as Trees, connectivity, tour, trail, cycles, etc.
- To understand the ideas of matchings and colourings in graphs and some of its applications
- Illustration on ramsey number of a graph and ramsey's graph with recursion formula to calculate ramsey number
- To explain the concepts of independent number and cliques of a graph and its results

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03.12.2018

1-L1	Unit I – Acyclic graphs, Tree and edges of tree in terms of vertices
2-L2	Cut edges; Equivalent condition for cut edges
3- L3	Spanning tree and some results on spanning tree
4-L4	Edge cut, bond and cotree
5-L5	Cut vertices; Necessary and sufficient condition for a vertex of a tree to be a cut vertex
6-L6	Edge contraction and recursion formula to find the number of spanning trees
7-L7	Cayley's formula and its proof that is given by Prufer
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Connectivity – its basic definitions and examples
10- L9	Theorem giving relation between edge and vertex connectivities
11-L10	Block of a connected graph
12-L11	Menger's theorem
13-L12	Application on construction of reliable communication networks
14-L13	Harary's theorem on *m*-connected graph
15-L14	Unit II – Tour, trail, walk path and cycle definitions with examples
16-L15	Necessary and sufficient condition for a graph to be an eulerian
17- L16	Necessary and sufficient condition for a connected graph to have an Euler trail
18- L17	Hamilton path and cylces of a graph and examples
19- L18	Necessary condition for a graph to be hamiltonian
20- L19	Dirac's theorem
21- L20	Closure of a graph and some basic results - **Allotting portion for Internal Test-I**
	Internal Test I beginson 18.01.2019
22- L21	Closure property on Hamiltonian graph
23- IT-1	**Internal Test-I**
24- L22	Chvatal's theorem on degree sequences
25- L23	Chvatal's theorem on degree majorized graphs
26- L24	Condition for a simple graph to be a Hamiltonian graph - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Application: The Chinese postman problem
28- L26	Fleury's Algorithm
29- L27	Unit III – Matchings and Berge theorem
30- P2	**College level meeting/Cell function**
31-L28	Matchings and coverings in bipartite graphs
32-L29	Hall's theorem on bipartite graph
33-L30	Perfect matching and some results
34- L31	Marriage theorem
35- L32	Theorem on maximum matching and minimum covering

36- L33	Tutte's theorem – necessary and sufficient condition for a graph to have a perfect matching
37- L34	Peterson theorem on 3-regular graph
38- L35	Edge chromatic number: basic definitions and examples
39- L36	Results on edge colouring and chromatic number for bipartite graph
40- L37	Vizing's theorem
41- L38	Vizing's theorem (continuation)
42-P3	**Department Seminar**
43- L39	Unit IV –Independent sets of a graph
44- L40	Necessary and sufficient condition for a subset of the vertex set to be an independent set of the graph
45- L41	Edge independence number and Gallai's theorem
46- L42	Koning's theorem on bipartite graph
47- L43	Clique of a graph and some basic results - **Allotting portion for Internal Test-II**
	Internal Test II beginson 25.02.2019
48- L44	Ramsey numbers and recursion formula on ramsey number
49-IT-II	**Internal Test-II**
50-L45	Illustration of ramsey number using graphs
51- L46	(k, l)-Ramsey graph and results- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Erdos theorem on r(k, k)
53- L48	Complete *m*-partite graph on *n*-vertices
54- L49	Turan's theorem
55- L50	Turan's theorem (continuation)
56- L51	Unit V – Vertex colouring: k-vertex colouring of a graph, chromatic number of a graph, illustration
57- L52	Theorem on k-critical graphs
58- L53	Results on critical graphs
59-P4	**College level meeting/ function**
60- L54	Driac's theorem on k-critical graph
61- L55	Brook's theorem
62- L56	Subvision of a graph
63- L57	Remarks on Hajos' conjecture
64- L58	Chromatic polynomials of a graph - **Allotting portion for Internal Test-III**
	Internal Test III beginson 22.03.2019
65- L59	Algorithm to find the chromatic polynomial of a graph
66- L60	Chromatic polynomial of any graph as a linear combination of chromatic polynomials of complete graphs
67-IT-III	**Internal Test-III**

68- L61	Girth and chromatic number
69- L62	Mycielski's theorem
70- L63	Problem discussion on chromatic number and polynomials - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
	Model Test begins on 08.04.2019
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Graph Theory"
CO1	Able to understand the definitions namely, cut vertex, bridge and blocks on a graph
CO2	Study the properties of trees and connectivity
CO3	Identify Eulerian graphs and apply results to identify Hamiltonian graphs
CO4	Understand the concepts Planarity including Euler identity
CO5	Discuss and understand the importance of the concepts Matchings and Colourings
CO6	Able to illustrate the ramsey number of a graph and ramsey's graph with recursion formula which is to calculate ramsey number
CO7	Explain the concepts of independent number and cliques of a graph and its results

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2019-2020)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Functional Analysis
Course Code	**PMAM41**

Class	II year (2019-2020)
Semester	Even
Staff Name	Dr. R. Murugesan
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objective

- The aim of the course is to enable the student to understand the basic ideas of functional analysis. The course deals with Normed linear spaces, Banach spaces, Hilbert spaces, bounded linear functional, operators and projections. Functional analysis is an important area of pure mathematics which has wide range of applications in quantum mechanics, theoretical physics, control theory, approximation theory, and optimization techniques. The learner will be able to appreciate these advanced mathematical structures and its application various fields.

Syllabus

Functional Analysis

UNIT 1: BanachSpaces: Banach Spaces- The definition and some examples-Continuous linear transformations- The Hahn Banach Theorem
Chapter 9 Sections 46, 47, 48 .
Problems: Section 46 (1-4), 47 (1-3) 48 (1).

UNIT 2: Imbedding: The Natural Imbedding of N in N**- The open mapping theorem
Chapter 9 Sections 49, 50
Problems: Section 49 (1-3), 50 (2,3)

UNIT 3: Hilbert Spaces: Conjugate of an operator -Hilbert Spaces-The Definition and some simple properties- Orthogonal compliments
Chapter 9 Section 51, Chapter 10 Sections 52, 53
Problems: Section 51 (1-3) 52 (4,6), 53 (1-4).

UNIT 4: The Conjugate space and adjoint: Orthonormal sets-The conjugate space H*- The Adjoint of an operator- Self adjoint operators
Chapter 10 Sections 54, 55, 56, 57
Problems: Section 54 (1,5) 55 (1-3), 56 (1-4), 57 (1,2)

UNIT 5: Spectral Theory: Normal and Unitary operators- projections, Finite dimensional spectral theory- Determinants and the spectrum of an operator- The spectral theorem
Chapter 10 Sections 58, 59, Chapter 11 Sections 61, 62
Problems: Section 58, 59, 61, 62 (1-5) .

Text Book: Introduction to Topology and Modern Analysis- G.F. SIMMONS-McGraw- Hill International Editions

Books for Reference:
1. Functional Analysis - Second edition (2011), Tata MC Graw Hill Education Private Ltd. (New Delhi) – Walter Rudin.
2. Functional Analysis – K.ChandrasekaraRao, Narosa Publishing House (2009) New Delhi.

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03.12.2018
1-L1	Introduction
2-L2	Banach Spaces
3- L3	Banach Spaces
4-L4	Banach Spaces
5-L5	The definition and some examples
6-L6	The definition and some examples
7-L7	Continuous linear transformations
8-L8	Continuous linear transformations
9-L9	Continuous linear transformations
10-P1	**Inauguration of Mathematics Association**
11-L10	The Hahn Banach Theorem
12-L11	The Hahn Banach Theorem
13-L12	The Hahn Banach Theorem
14-L13	**Imbedding**
15-L14	The Natural Imbedding of N in N**
16-L15	The Natural Imbedding of N in N**
17-L16	The Natural Imbedding of N in N**
18-L17	The Natural Imbedding of N in N**
19-L18	The open mapping theorem
20-L19	The open mapping theorem
21-L20	The open mapping theorem
22-L21	The open mapping theorem
23-L22	Hilbert Spaces**Allotting portion for Internal Test-I**
	Internal Test I begins18.01.2018
24-L23	Hilbert Spaces
25-L24	Hilbert Spaces
26-IT-1	**Internal Test I**

27-L25	Conjugate of an operator
28-L26	Conjugate of an operator
29-L27	Conjugate of an operator
30-L28	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Hilbert Spaces
32- L30	Hilbert Spaces
33- L31	Hilbert Spaces
34-P2	**College level meeting/Cell function**
35- L32	The Definition and some simple properties
36- L33	The Definition and some simple properties
37- L34	The Definition and some simple properties
38- L35	Orthogonal compliments
39- L36	Orthogonal compliments
40- L37	Orthogonal compliments
41- L38	The Conjugate space and adjoint
42- L39	Orthonormal sets
43- L40	Orthonormal sets
44- L41	Orthonormal sets
45- L42	The conjugate space H*
46- L43	The conjugate space H*
47- L44	The conjugate space H*
48- L45	The Adjoint of an operator
49- L46	The Adjoint of an operator
50- L47	The Adjoint of an operator
51- P3	**Department Seminar**
52- L48	Self adjoint operators
53- L49	Self adjoint operators
54- L50	Self adjoint operators
55- L51	Self adjoint operators
56-L52	Self adjoint operators **- Allotting portion for Internal Test-II**
	Internal Test II begins on25.02.2019
57-L53	Spectral Theory
58-L54	Spectral Theory
59-IT-II	**Internal Test-II**
60- L55	Spectral Theory
61- L56	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Normal and Unitary operators
63- L58	Normal and Unitary operators
64- L59	Normal and Unitary operators
65- L60	Normal and Unitary operators
66- L61	projections
67- L62	projections
68- L63	Finite dimensional spectral theory

69- L64	Finite dimensional spectral theory
70- L65	Finite dimensional spectral theory
71- L66	Determinants and the spectrum of an operator
72- L67	Determinants and the spectrum of an operator
73- L68	Determinants and the spectrum of an operator
74-P4	**College level meeting/ function**
75- L69	Determinants and the spectrum of an operator-
76- L70	The spectral theorem
77- L71	The spectral theorem
78- L72	The spectral theorem
79- L73	The spectral theorem**Allotting portion for Internal Test-III**
	Internal Test III begins on22.03.2019
80- L74	Problems
81- L75	Problems
82-IT-III	**Internal Test-III**
83- L76	Problems
84- L77	**Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Test 08.04.2019**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course “Functional Analysis”
CO1	To gain knowledge about Banach Spaces, Hilbert Spaces and Banach Algebra.
CO2	To use algebraic structure in Analysis.
CO3	Graduates will have a strong foundations and in depth understanding of the current topics related with functional Analysis, Spectral Theory, Approximation Theory.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Complex Analysis
Course Code	PMAM42
Class	II year (2018-2019)
Semester	Even
Staff Name	Mrs. T. Santhakumari
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To gain advanced knowledge about Complex functions and Analytic functions as mappings
- To study Cauchy integral formula, local properties of analytic functions, general form ofCauchy’s theorem
- To evaluation of definite integrals and harmonic functions
- To understand the concept of Analyticity Conformality, Linear Transformation and Complex Integration

Syllabus

MSU / 2017-18 / PG –Colleges / M.Sc.(Mathematics) / Semester -IV / Ppr.no.19 / Core - 17

Complex Analysis(90 hours)

Prerequisite:

Basic knowledge of concepts of Differentiation and Integration for functions of real variables further in UG level they level the fundamental Ideas and theorems about Complex plane power series residues.

Unit I: **Analytic functions :**Analytic functions – Polynomials – Power series- Abel's limit theorem.

Chapter 2: Sec 1.1 – 1.4, Sec 2 .4 &2.5 .
Problems: Chapter 2: 1.2 (1,4,5,7) 2.4 (2- 6) .

Unit II: **Conformal mappings :**Conformal mappings - Linear transformations –the linear group – the cross ratio- Symmetry – line integrable – line integrable as functions of arc.

Chapter 3: Sec 2.3, 3.1 – 3.3, **Chapter 4 :** Sec 1.1 – 1.3(1,3,4,5).
Problems: Chapter3: 3.1 (4); 3.2 (1,4) 3.3 (1,2,4);

Unit III: **Cauchy's theorem for Rectangle :**Cauchy's theorem for Rectangle – Cauchy's theorem in a disc, Cauchy's Integral formula, Index of a point – The integral formula.

Chapter 4: Sec 1.4 & 1.5, 2.1& 2.2
Problems: Chapter 4: 2.2 (1-3)

Unit IV: **Higher derivatives** : Taylor's Theorem :Higher derivatives -Taylor's Theorem – Zeros and Poles – The local mapping – The maximum principle and the general statement of Cauchy's Theorem (Statement only) .

Chapter 4: Sec 2.3, 3.1 – 3.4 and 4.4.
Problems: Chapter 4 **:** 2.3 (1) , 3.2(2 – 4)

Unit V: **Calculus of Residues:**Calculus of Residues –The Residue theorem - The Argument Principle – Evaluation of definite integrals.

Chapter 4: Sec 5.1 – 5.3
Problems: Chapter 4: 5.2(1-3) ,5.3 (1, 3(a- g))

Text : **Complex Analysis – Lars V.Ahlfors** – Tata McGraw Hill (Third Edition)

Book for Reference:

Foundations of Complex Analysis – S.Ponnusamy – Narosa Publishing House 2015 (Second Edition).

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begins on 03.12.2018
1-L1	Unit I – Concepts of analytic functions
2-L2	Limits and continuity
3- L3	Definition of analytic functions
4-L4	Some basic results and examples on analytic functions
5-L5	Theorems based on analytic functions
6-L6	Harmonic functions and Laplace equation
7-L7	Conjugate harmonic functions
8-L8	Problems on analytic functions
9-L9	Luca's theorem
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Rational functions – Results
12-L11	Theorem on rational function
13-L12	Rationalize a function
14-L13	Abel's theorem
15-L14	Abel's limit theorem
16-L15	Exercise problems on analytical functions
17-L16	Radius of convergence of a function – problems
18-L17	Unit II – Conformal mappings
19-L18	Some results on conformal mapping
20-L19	The linear group
21-L20	Finding the linear transformation
22-L21	Problems on linear transformation
23-L22	Cross ratio - **Allotting portion for Internal Test-I**
	Internal Test I begins on 18.01.2019
24-L23	Theorems in cross ratio
25-L24	Problem discussion on cross ratio
26-IT-1	**Internal Test-I**
27-L25	Symmetry property
28-L26	Theorem on symmetry property
29-L27	Line integrals

30-L28	Properties of line integrals - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Problems on line integrals
32- L30	Rectifiable arcs
33- L31	Basic results on rectifiable arcs
34-P2	**College level meeting/Cell function**
35- L32	Problems on rectifiable arcs
36- L33	Unit III – Cauchy's theorem for rectangle
37- L34	Cauchy's theorem for rectangle (continuation)
38- L35	Finding integral values using Cauchy's theorem
39- L36	Cauchy's theorem in a disk
40- L37	Cauchy's theorem in a disk (continuation)
41- L38	Index of a point with respect to a closed curve
42- L39	Lemma in index number
43- L40	Definition of index and some results
44- L41	Lemma to finding the integral formula
45- L42	The integral formula - Proof discussion
46- L43	Problems to find integral values using the integral formula
47- L44	Exercise problems discussion
48- L45	Unit IV – Higher order derivatives
49- L46	Lemma for Morera's theorem
50- L47	Morera's theorem – proof discussion
51- P3	**Department Seminar**
52- L48	Lioville's theorem
53- L49	Fundamental theorem of Algebra
54- L50	Problem discussion
55- L51	Removable singularities
56-L52	Taylor's theorem - **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
57-L53	Zeros and poles
58-L54	Relation between zeros and poles in rational polynomials
59-IT-II	**Internal Test-II**
60- L55	Isolated singularities and illustration
61- L56	Essential singularities and illustration - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Meromorphic functions
63- L58	Theorems on singularities
64- L59	Problems to find zeros and poles
65- L60	Local mapping theorem
66- L61	Maximum modulus principle
67- L62	Some more theorems
68- L63	General statement of Cauchy's theorem - Problems to evaluate the integral value
69- L64	Unit V – Residues
70- L65	Residue theorem

71- L66	Some remarks under residue theorem
72- L67	Problems for finding residue
73- L68	Argument principle
74-P4	**College level meeting/ function**
75- L69	Theorems on argument principle
76- L70	Rouche's theorem
77- L71	Generalisation of Arugment principle
78- L72	Evaluation of definite integrals
79- L73	Problems on definite integrals - **Allotting portion for Internal Test-III**
	Internal Test III begins on 22.03.2019
80- L74	Type I - problems
81- L75	Type II - problems
82-IT-III	**Internal Test-III**
83- L76	Type III - problems
84- L77	Type IV - problems - **Test Paper distribution and result analysis**
85- L78	Exercise problems discussion
	Entering Internal Test-III Marks into University portal
	Model Test begins on 08.04.2019
86- MT	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89- L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Complex Analysis"
CO1	Able to analyze Analytic functions and exponential functions
CO2	Able to apply Cauchy's theorem for disk and the Integral formula
CO3	Able to understand Local properties of Analytic functions
CO4	Able to study Residue theorem and the argument principle
CO5	Able to differentiate the Taylor's series and Laurent series
CO6	Acquistation of solving problems in Complex Integration and boundary value problems.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Advanced Algebra II
Course Code	PMAM43
Class	II year (2018-2019)
Semester	Even
Staff Name	Mr. C. Prabu Daniel Pakkianathan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- This paper aims to an in depth knowledge about the algebraic structure of fields, which is vital in providing algebraic tools to find roots of equations.This course starts with basic concepts of fields, existence and properties of extension fields of polynomials. Also it aims to provide the use of Gaolis theory in discussing the existence of roots of polynomials

Syllabus

Advanced Algebra II

Unit I: Extension fields.:Extension fields.

Sections: 5.1 Problems: 5.1(1-5, 8)

Unit II: Roots of Polynomials: Roots of polynomials – More about roots.

Sections: 5.3, 5.5 Problems: 5.5(1-3)

Unit III: Elements of Galois Theory: Elements of Galois theory.

Sections: 5.6

Unit IV: Finite fields :Finite fields – Wedderburn's theorem(First proof only)

Sections: 7.1, 7.2(Theorem 7.2.1-First proof only)

Unit V: Some special theorems:A theorem of Frobenius – Integral quaternions and the four square theorem.

Sections: 7.3, 7.4.

Text Book:

Topics in Algebra(Second edition) Wiley Eastern Limited – I.N. Herstein

Book for Reference:

1) A course in Abstract algebra (3rd edition)-Vijay.K.Khanna,S.K.Bhambri – Vikas Publishing House –Newdelhi.
2) Modern Algebra –Surjeetsingha and Qazizameerudin- Vikas Publishing House –Newdelhi.
3) Fields and Rings –Kaplemsky ,Irving (Second edition)-University of Chicago- Chicago -(1972).

Course Calendar

Hour allotment	**Class Schedule**
	Even Semester Begin on 03.12.2018
1-L1	Introduction
2-L2	Extension fields
3- L3	Extension fields
4-L4	Extension fields
5-L5	Extension fields
6-L6	Extension fields
7-L7	Extension fields
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Exercise Problems
10- L9	Exercise Problems
11-L10	Roots of polynomials
12-L11	Roots of polynomials
13-L12	Roots of polynomials
14-L13	Roots of polynomials
15-L14	Roots of polynomials
16-L15	Roots of polynomials
17- L16	More about roots
18- L17	More about roots
19- L18	More about roots
20- L19	More about roots
21- L20	Problem Discussions - **Allotting portion for Internal Test-I**
	Internal Test I beginson 18.01.2019
22- L21	Elements of Galois theory
23- IT-1	**Internal Test-I**
24- L22	Elements of Galois theory
25- L23	Elements of Galois theory
26- L24	Elements of Galois theory**- Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Elements of Galois theory
28- L26	Elements of Galois theory
29- L27	Elements of Galois theory
30- P2	**College level meeting/Cell function**
31-L28	Elements of Galois theory
32-L29	Elements of Galois theory
33-L30	Elements of Galois theory
34- L31	Elements of Galois theory
35- L32	Elements of Galois theory
36- L33	Elements of Galois theory
37- L34	Finite fields
38-L35	Finite fields
39- L36	Finite fields
40- L37	Finite fields

41- L38	Finite fields
42-P3	**Department Seminar**
43- L39	Finite fields
44- L40	Finite fields
45- L41	Finite fields
46- L42	Finite fields
47- L43	Problem Discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
48- L44	Wedderburn’s theorem
49-IT-II	**Internal Test-II**
50-L45	Wedderburn’s theorem
51- L46	Wedderburn’s theorem**- Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	A theorem of Frobenius
53- L48	A theorem of Frobenius
54- L49	A theorem of Frobenius
55- L50	A theorem of Frobenius
56- L51	A theorem of Frobenius
57- L52	A theorem of Frobenius
58- L53	A theorem of Frobenius
59-P4	**College level meeting/ function**
60- L54	Integral quaternions and the four square theorem.
61- L55	Integral quaternions and the four square theorem.
62- L56	Integral quaternions and the four square theorem.
63- L57	Integral quaternions and the four square theorem.
64- L58	Problem Discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins on 22.03.2019
65- L59	Revision
66- L60	Revision
67-IT-III	**Internal Test-III**
68- L61	Class Test
69- L62	Class Test
70- L63	Class Test**- Test Paper distribution and result analysis**
	Model test begins on 08.04.2019
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23.04.2019

Course Outcomes

Learning Outcomes	**COs** of the course "Advanced Algebra II"
CO1	Gain knowledge in fields in the theory of numbers, the theory of equations and Galois Theory.
CO2	Understand the application of Galois Theory in theory of equations and Geometry.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Topology II
Course Code	PMAM44
Class	II year (2018-2019)
Semester	Even
Staff Name	1. P.Gino Metilda

	2. C.Prabhu Daniel Pakianathan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- Gain knowledge in separation axioms iin Topological Spaces. .
- Understanding the concepts of Normal and Regular Spaces
- Understanding the concepts of Locally finite

Syllabus

UnitI: **Separation axioms.:** The countability axioms – Separationaxioms.

Chapter 4: Sections 30, 31.

Problems: Section 30: 2,3 and Section 31: 1-3.

UnitII: **The Urysohn lemma :**Normal spaces – The Urysohnlemma.

Chapter 4: Sections 32, 33.

Problems: Section 32: 1, 3, 4 and Section 33: 1-2.

UnitIII: **Urysohn and Tietz extension theorem :**The Urysohn metrization theorem – The Tietz extensiontheorem.

Chapter 4: Sections 34, 35.

Problems: Section 34: 1, 3 and Section 35: 1, 3.

UnitIV: **The Tychonofftheorem :**TheTychonoff theorem – Local finiteness.

Chapter 5: Sections 37 and Chapter 6: Section 39

Problems: Section 37: 1,2 and Section 39: 3,5.

UnitV: **Baire Spaces.:**BaireSpaces.

Chapter 8: Sections 48.

Problems: Section 48: 1, 3, 4, 6.

Course Calendar

Hour allotment	Class Schedule
	Even Semester Begin on 03-12-2018
1-L1	Unit I Definition in countable axioms and examples
2-L2	Theorem in countable axioms
3- L3	Theorem in countable axioms
4-L4	Theorem in countable axioms
5-L5	Definition in separation axioms
6-L6	Theorems in separation axioms
7-L7	Theorems in separation axioms
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Theorems in separation axioms
10- L9	Theorems in separation axioms
11-L10	Problems in countable axioms
12-L11	Problems in countable axioms
13-L12	Problems in separation axioms
14-L13	Problems in separation axioms
15-L14	Unit II Theorems in normal spaces
16-L15	Theorems in normal spaces
17- L16	Theorems in normal spaces
18- L17	Theorems in normal spaces
19- L18	Problems in normal spaces
20- L19	Problems in normal spaces
21- L20	Countable axioms to normal spaces- **Allotting portion for Internal Test-I**
	Internal Test I begins on 18.01.2019
22- L21	Urysohn lemma-Theorem
23- IT-1	**Internal Test-I**
24- L22	Urysohn lemma-Theorem
25- L23	Theorems using Urysohn lemma
26- L24	Theorems using Urysohn lemma - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Theorems using Urysohn lemma
28- L26	Problems using Urysohn lemma
29- L27	Unit III Introduction to Urysohn metrization theorem
30- P2	**College level meeting/Cell function**
31-L28	Proof of Urysohn metrization theorem
32-L29	Proof of Urysohn metrization theorem
33-L30	Proof of Urysohn metrization theorem

34- L31	Imbedding theorem
35- L32	Tietz extension theorem
36- L33	Tietz extension theorem
37- L34	Tietz extension theorem
38- L35	Problems using Urysohn metrization theorem
39- L36	Problems using Urysohn metrization theorem
40- L37	Problems using Tietz extension theorem
41- L38	Problems using Tietz extension theorem
42-P3	**Department Seminar**
43- L39	Problems using Tietz extension theorem
44- L40	Unit IV Preliminaries in Tychnoff theorem
45- L41	Lemma1 for Tychnoff theorem
46- L42	Lemma2 for Tychnoff theorem
47- L43	Urysohn lemma to Tietz extension theorem - **Allotting portion for Internal Test-II**
	Internal Test II begins on 25.02.2019
48- L44	Proof of Tychnoff theorem
49-IT-II	**Internal Test-II**
50-L45	Proof of Tychnoff theorem
51- L46	Proof of Tychnoff theorem- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Definition of Locally finite and theorems
53- L48	Theorems in Locally finite
54- L49	Theorems in Locally finite
55- L50	Introduction of Baire spaces and examples
56- L51	Lemma in Baire spaces
57- L52	Baire category theorem
58- L53	Unit V Theorem in Baire spaces
59-P4	**College level meeting/ function**
60- L54	Theorem in Baire spaces
61- L55	Theorem in Baire spaces
62- L56	Problems in Baire spaces
63- L57	Problems in Baire spaces
64- L58	Tychnoff theorem to Baire spaces- **Allotting portion for Internal Test-III**
	Internal Test III begins on 22.03.2019
65- L59	Exercise problems for revision
66- L60	Exercise problems for revision
67-IT-III	**Internal Test-III**
68- L61	Exercise problems for revision
69- L62	Exercise problems for revision
70- L63	Exercise problems - **Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test**
72-MT	**Model Test**
73-MT	**Model Test**

74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 23-04-2019

Course Outcomes

Learning Outcomes	**COs** of the course "Topology II"
CO1	Improves the understanding of Seperation axioms
CO2	Solved problems in Sepeeration axioms
CO3	Get knowledge to do research in these areas

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc (Mathematics)
Course Name	Algebra - I
Course Code	PMAM11
Class	I year (2018-2019)
Semester	Odd
Staff Name	Mr. R. Arul Ananthan
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To understand the concepts on group theory
- To classify the properties in Automorphism and Homomorphism
- To study the various proofs of Sylow's theorems
- To study the properties of finite abelian groups.

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begins on 18.06.2018
1-L1	Unit I – Introduction to group theory: A counting principle
2-L2	Product of two subgroups of a group and its characterisation
3- L3	Finding the order of product of subgroups
4-L4	Finding the order of product of subgroups (Continuation)
5-L5	Cosets, Normal subgroup and basic results
6-L6	Necessary and sufficient condition for a subgroup to be a normal subgroup of the given group
7-L7	Quotient group of a given group by its normal subgroup
8-L8	Order of a quotient group
9-L9	Group homomorphism and examples
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Lemma to define natural homomorphism
12-L11	Kernel of a homomorphism and some results on homomorphisms
13-L12	Proving that the kernel of a homomorphism is a normal subgroup
14-L13	Isomorphism, isomorphic and proving that isomorphic is an equivalence relation
15-L14	First isomorphism theorem on groups
16-L15	simple groups - Cauchy's theorem for Abelian groups
17-L16	Sylow's theorem for Abelian groups
18-L17	Sylow's theorem for Abelian groups continuation
19-L18	Unit II – Automorphism of a group and proving that the set of automorphism is a group
20-L19	The group of inner automorphisms
21-L20	The quotient form of inner automorphims using first isomorphism theorem
22-L21	Relation between order of an element and its image under automorphism
23-L22	Problems on inner automorphism - **Allotting portion for Internal Test-I**
	Internal Test I begins on 30.07.2018

24-L23	Structure of an automorphism of a finite cyclic group
25-L24	Cayley's theorem
26-IT-1	**Internal Test-I**
27-L25	Cayley's theorem continuation
28-L26	Generalization of Cayley's theorem
29-L27	Proof arguments on the generalization of Cayley's theorem
30-L28	Necessary condition for a group cannot be simple - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Applications of Cayley's theorem
32- L30	Solvable groups: Solvability of its subgroups and homomorphic images.
33- L31	Product of solvable groups
34-P2	**College level meeting/Cell function**
35- L32	Sequence of subgroups using commutator subgroup of the given group and its solvability
36- L33	Unit III – Permutation Groups : Construction of permutation group on four symbols
37- L34	Equivalence relation on permutation group
38- L35	orbit of an elements under a map and a cycle of a map
39- L36	Proving that every permutation is the product of its cycles
40- L37	Transposition , even / odd permutation and some results
41- L38	Alternating subgroup of a permutation with index two
42- L39	Conjugacy relation and proving that this is an equivalence relation
43- L40	Normalizer of an element in a group and its property
44- L41	Another counting principle using the order of normalizer – Class equation
45- L42	Application of the class equation
46- L43	Necessary condition for the center of a group to be non-trivial
47- L44	Cauchy's theorem
48- L45	Partition of an integer and examples
49- L46	Finding the number of conjugate classes in a permutation groups
50- L47	Illustration of conjugate classes in a permutation groups using a very special and simple case
51- P3	**Department Seminar**
52- L48	Unit IV – Sylow's theorem with Wielandt's proof
53- L49	First proof of Sylow's theorem
54- L50	*p*-Sylow subgroub of a group and Second proof of Sylow's theorem
55- L51	Second proof of Sylow's theorem (Continuation)
56-L52	Third proof of Sylow's theorem - **Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
57-L53	The number $n(k)$ and its formula
58-L54	An existence of *p*-Sylow subgroup of a symmetric groups
59-IT-II	**Internal Test-II**

60- L55	An equivalence relation between two subgroups in a group
61- L56	Double cosets and order of a double coset- **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	A gut step in the third proof of Sylow's theorem
63- L58	Second part of Sylow's theorem
64- L59	Lemma to prove the third part of Sylow's theorem
65- L60	Third part of Sylow's theorem
66- L61	Application of second and third part of Sylow's theorem
67- L62	Examples on finding (prime)-Sylow subgroups in finite groups
68- L63	Examples on finding (prime)-Sylow subgroups in finite groups
69- L64	Unit V – Cartesian product of two groups and operations upon it
70- L65	External direct product of two groups and a particular normal subgroup.
71- L66	External direct product of any n groups
72- L67	Internal direct product of normal subgroups in a group
73- L68	Relation between normal subgroups that are in internal direct product
74-P4	**College level meeting/ function**
75- L69	An isomorphism between the external and internal direct products
76- L70	Fundamental result on finite abelian group as a direct product of cyclic groups
77- L71	Proof arguments on finite abelian group as a direct product of cyclic groups
78- L72	Invariants of an abelian group
79- L73	Definition of $G(s)$ and its property - **Allotting portion for Internal Test-III**
	Internal Test III begins on 08.10.2018
80- L74	Finding the order of $G(p^m)$
81- L75	Invariants and isomorphisms
82-IT-III	**Internal Test-III**
83- L76	Proving the uniqueness of invariants on isomorphic groups
84- L77	Finding the number of abelian groups of prime power order - **Test Paper distribution and result analysis**
85- L78	Problem discussion on finite abelian groups
	Entering Internal Test-III Marks into University portal
	Model Test begins on 22.10.2018
86- MT	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89- L79	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Algebra - I"
CO1	Student will be able to identify the concept of Normal groups and Quotients groups
CO2	To explain the concepts of solvable groups and its properties
CO3	Student will be able to analyze Permutation groups and Counting principle
CO4	Student will be able to explain Sylow's theorem and its applications
CO5	To discuss about both internal and external products and study various results on finite abelian groups
Experimental Learning	
EL1	Motivated to solve CSIR-NET questions based on group theory

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analysis I
Course Code	PMAM12
Class	I year (2018-2019)
Semester	Odd
Staff Name	Mrs.P.Gino Metilda
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To define a metric space and analyse certain properties on it, such as, closedness, boundedness, perfect sets, open sets, connected sets etc.
- Describe the compact sets and its characterization

Syllabus

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 – Thenumber 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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2018
1-L1	Unit – I Metric space, distance functions, its examples
2-L2	Types of intervals, convex. Definitions of neighbourhood, limit point and isolated point
3- L3	Definitions of interior point, open sets, closed sets and perfect sets.
4-L4	Definitions of bounded and unbounded sets, dense subsets in a metric spaces
5-L5	Characterization of the neighbourhood of a limit points; Theorems to describe neighbourhood as open set
6-L6	Complement of a set; Relation between open and closed sets using complement
7-L7	Union and intersection of collection of open or closed sets.
8-L8	Closure of a set; properties of closure of a set in a metric space; and open relative to subspaces
9-L9	Compact sets and compact relative to subspace and whole space
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Characterization of compact sets
12-L11	Definition of k-cell and proving that every k-cell is compact.
13-L12	Heine-Borel theorem, Weierstrass theorem
14-L13	Uncountability property of Perfect sets in R^k
15-L14	The Cantor set – construction of a cantor set and some results on it
16-L15	Defining connected set using separated sets
17-L16	Whole structure of a connected subset of the real line R^1
18-L17	Unit – II Sequences, limit point of a sequence, convergent sequence. Range of a sequence and boundedness; some examples
19-L18	Necessary and sufficient condition of a sequence in a metric space to be convergent;
20-L19	Uniqueness of limit; relation between convergent and boundedness; existence of a convergence sequence to a limit point of a set
21-L20	Algebraic operations on convergent sequences
22-L21	Particular sequence in R^k and its convergency and algebraic operations
23-L22	Subsequences; Existence of a convergent subsequence of a sequence in compact space - **Allotting portion for Internal Test-I**
	Internal Test I begins (30.07.2018)
24-L23	Sub-sequential limits of a sequence and its closed property
25-L24	Cauchy sequence, diameter of a sequence; diameter of a closure of a set.
26-IT-1	**Internal Test-I**
27-L25	Relation between convergent and Cauchy sequence; Cauchy criterion for convergence of a sequence
28-L26	Monotonic sequence: monotonic increasing and decreasing; Problems.
29-L27	Convergence of monotonic sequence in terms of boundedness property
30-L28	Upper limit and lower limit of a sequence; Characterization of upper (and lower) limit and some properties - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal

31- L29	Some special sequence (proof using Squeeze lemma)
32- L30	Series and its sum in terms of sequence of partial sums;
33- L31	Cauchy criterion of a series
34-P2	**College level meeting/Cell function**
35- L32	Comparison test; proof argument and testing convergency of series using comparison test
36- L33	Series of non negative terms; Geometric series, Cauchy's condensation test
37- L34	The number *e* and its properties.
38- L35	Unit – III Root test for series
39- L36	Ratio test for series; examples to check the convergence of a series using root and ratio tests
40- L37	Criticism about the root and ratio test.
41- L38	Power series, coefficients of the power series. Radius of convergence of a power series
42- L39	Examples to find the radius of convergence for given series
43- L40	Summation of parts and convergence of a series that is a product of bounded and decreasing sequence
44- L41	Alternating series; Leibnitz test for convergence for alternating series
45- L42	Absolute convergent and conditionally convergent of a series and relation between them
46- L43	Problems on absolute convergent series and alternating series
47- L44	Addition and multiplication of series; the Cauchy product of two given series
48- L45	Mertens theorem to check the convergence of Cauchy product of series
49- L46	Abel's theorem.
50- L47	Examples on Cauchy product of series
51- P3	**Department Seminar**
52- L48	Unit – IV Limits of functions; and uniqueness
53- L49	Algebraic properties on limits of functions
54- L50	Continuous function at a point and continuous on a space
55- L51	Continuous function and its limits; Continuity of a composition of functions
56-L52	Proving that the inverse image of an open(a closed) set is open(closed) – **Allotting portion for Internal Test-II**
	Internal Test II begins (03.09.2018)
57-L53	Continuous property on functions from any metric space into Euclidean space R^k
58-L54	Continuity and compactness
59-IT-II	**Internal Test-II**
60- L55	Continuous image of a compact set is compact
61- L56	Boundedness of a function, Continuous mapping of a compact space is bounded – **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Uniformly continuous; Relation between continuity and uniformly continuity
63- L58	Discussion using examples to know the essential of compactness of the domain of a continuous function to become a uniformly continuous
64- L59	Continuity and connectedness; Intermediate value theorem
65- L60	Discontinuities – Left and right limit of a function at a point; Discontinuities of

	first kind and second kind
66- L61	Problems to check the discontinuities of a function
67- L62	Monotonic functions – monotonically increasing and decreasing;
68- L63	Existence of left and right limits of a monotonic function at every point on intervals
69- L64	Countability of discontinuous point of a monotonic function
70- L65	Unit – V The derivative of a real function
71- L66	Implication between continuity and differentiability of a function
72- L67	Differentiability on algebra of differentiable functions
73- L68	Differentiability of composition of differentiable functions
74-P4	**College level meeting/ function**
75- L69	Examples to know the continuity of first and second derivative of functions
76- L70	Local maximum and local minimum; and its differentiable value
77- L71	Generalized mean value theorem and Mean value theorem
78- L72	Differentiability and monotonicity;
79- L73	Intermediate value theorem - **Allotting portion for Internal Test-III**
	Internal Test III begins (08.10.2018)
80- L74	L'Hospital's rule
81- L75	Problems to test differentiability using L'Hospital's rule
82-IT-III	**Internal Test-III**
83- L76	Derivatives of higher order
84- L77	Taylor's theorem - **Test Paper distribution and result analysis**
85- L78	Problems on Taylor's theorem
	Entering Internal Test-III Marks into University portal
	Model test begins (22.10.2018)
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Analysis II"
CO1	After completing this course, the student will be able to: Attain mastery in metric spaces, Perfect sets and Connected sets.
CO2	Locate Sequence and Series comprising convergence sequences, upper and lower limits
CO3	Demonstrate the various tests for convergence in series
CO4	Enumerate the limits of functions, infinite limits and limit at

	infinity
CO5	Understand, in details, about continuity and uniform continuity of functions
CO6	Define properties of Differentiation
CO7	Study in detail the Mean value theorem and Taylor's theorem

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)d

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Analytic Number Theory
Course Code	PMAM13
Class	I year (2018-2019)
Semester	Odd

Staff Name	Mrs. T. Santhakumari
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To introduce the fundamental theorem of arithmetic and the Euclidean algorithm
- To explain about various kinds of arithmetical functions and its relations
- To find the averages of arithmetical functions
- To understand the prime number theorem and its equivalent forms as well as to derive some of the asymptotic formulas for certain sums

Syllabus

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).

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2018
1-L1	Unit I – Divisibility and properties of divisibility
2-L2	Greatest common divisor of two integers and a theorem representing the structure of g.c.d.
3- L3	Algebraic properties of greatest common divisor and Euclid's lemma
4-L4	Problem discussion
5-L5	Prime numbers and composite numbers; Euclid's theorem
6-L6	Problems on prime and composite numbers
7-L7	The fundamental theorem of arithmetic
8-L8	Some theorems using factorization
9-L9	The series of reciprocals of the primes
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Exercise problem discussion
12-L11	The division algorithm
13-L12	The Euclidean algorithm
14-L13	Problems to finding the g.c.d. using the Euclidean algorithm
15-L14	The greatest common divisor of more than two numbers
16-L15	Exercise problem discussion
17-L16	Exercise problem discussion
18-L17	Unit II – Introduction to arithmetical functions
19-L18	The mobius function and its result
20-L19	More examples and results in arithmetical functions and mobius function
21-L20	The Euler totient function
22-L21	A relation between mobius and Euler totient function
23-L22	Product formula for Euler totient function - **Allotting portion for Internal Test-I**
	Internal Test I begins on 30.07.2018
24-L23	Further properties of Euler totient function
25-L24	The Dirichlet product of arithmetical functions
26-IT-1	**Internal Test-I**
27-L25	Commuativity and associativity of Dirichlet convolution
28-L26	The identity function
29-L27	Dirichlet inverses and its properties

30-L28	The Mobius inversion formula - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	The Mangoldt's function and examples
32- L30	Theorem on Mangoldt's function
33- L31	Exercise problems discussion
34-P2	**College level meeting/Cell function**
35- L32	Exercise problems discussion
36- L33	Unit III – Multiplicative functions and complete multiplicative functions
37- L34	Theorems on Multiplicative functions
38- L35	Multiplicative functions and Dirichlet multiplication
39- L36	Theorems on Dirichlet product of multiplicative functions
40- L37	Exercise problem discussion
41- L38	The inverse of a completely multiplicative function
42- L39	Liouville's function and its sum
43- L40	The divisor functions
44- L41	The inverse of the divisor functions
45- L42	Generalized convolutions and its associative property
46- L43	The Generalized inversion formula
47- L44	Problems on Generalized inversion formula
48- L45	Unit IV – An introduction to averages of arithmetical functions
49- L46	The big oh notation and Asymptotic equality of functions
50- L47	The Euler's summation formula
51- P3	**Department Seminar**
52- L48	Some elementary asymptotic formulas
53- L49	Some elementary asymptotic formulas (continuation)
54- L50	The average order of $d(n)$
55- L51	Dirichlet's asymptotic formula
56-L52	Deriving the Dirichlet's asymptotic formula - **Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
57-L53	The average order of the divisor functions
58-L54	The average order of the Euler totient functions
59-IT-II	**Internal Test-II**
60- L55	An application to the distribution of lattice points visible from the origin
61- L56	Definitions: Mutually visible points - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Lattice points - theorem
63- L58	Necessary and sufficient condition for two lattice points to be mutually visible
64- L59	Examples on Lattice points
65- L60	Density of the set of lattice points visible form the origin
66- L61	Average order of mobius and Mangoldt's function
67- L62	Exercise problem discussion
68- L63	Exercise problem discussion
69- L64	Unit V – The partial sums of a Dirichlet product

70- L65	Application to mobius and Mangoldt’s function
71- L66	The Legendre’s identity
72- L67	Theorem to determine an asymptotic formula for $log[x]!$
73- L68	Elementary theorems on the distribution of Prime numbers
74-P4	**College level meeting/ function**
75- L69	Chebyshev’s psi-function
76- L70	Chebyshev’s theta-function
77- L71	Inequality on difference of Chebyshev’s functions
78- L72	Relations connecting Chebyshev’s functions
79- L73	Abel’s identity - **Allotting portion for Internal Test-III**
	Internal Test III begins on 08.10.2018
80- L74	Expression of Chebyshev’s functions in terms of integrals
81- L75	Equivalent forms of the prime number theorem
82-IT-III	**Internal Test-III**
83- L76	Equivalent forms of the prime number theorem (continuation)
84- L77	Inequalities for $\pi(n)$- **Test Paper distribution and result analysis**
85- L78	Inequalities for p_n
	Entering Internal Test-III Marks into University portal
	Model Test begins on 22.10.2018
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course “Analytic Number Theory”
CO1	After completing this course, the student will be able to Understand the concepts of divisibility and Primes.
CO2	To explain about various kinds of arithmetical functions and the relation among them
CO3	Able to calculate the averages of several arithmetical functions
CO4	To understand the prime number theorem and its equivalent forms
CO5	To derive some of the asymptotic formulas for certain sums

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Ordinary Differential Equation
Course Code	PMAM14
Class	I year (2018-2019)
Semester	Odd
Staff Name	Mr. C.Prabu Daniel Pakkianathan
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80Hrs (5 units; 5×16=80; 16Hrs /unit)	

Syllabus

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.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18-6-2018
1-L1	Introduction
2-L2	Second Order linear equations
3- L3	General solution of the Homogeneous equations
4-L4	General solution of the Homogeneous equations
5-L5	General solution of the Homogeneous equations
6-L6	The use of a known solution to find another
7-L7	The use of a known solution to find another
8-L8	The use of a known solution to find another
9-L9	The method of variation of parameters
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	The method of variation of parameters
12-L11	The method of variation of parameters
13-L12	The method of variation of parameters
14-L13	Power series solutions
15-L14	Power series solutions
16-L15	A review of power series solutions
17-L16	A review of power series solutions
18-L17	A review of power series solutions
19-L18	Series solution of first order equations
20-L19	Series solution of first order equations
21-L20	Series solution of first order equations
22-L21	Series solution of first order equations
23-L22	**____ - Allotting portion for Internal Test-I**
	Internal Test I begins on 30-7-2018
24-L23	Second order equations
25-L24	Second order equations
26-IT-1	**Internal Test-I**
27-L25	Second order equations
28-L26	Ordinary points
29-L27	Ordinary points
30-L28	**____ - Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Ordinary points
32- L30	Regular singular points

33- L31	Regular singular points
34-P2	**College level meeting/Cell function**
35- L32	Regular singular points
36- L33	Regular singular points
37- L34	Legendre polynomials
38- L35	Legendre polynomials
39- L36	Legendre polynomials
40- L37	Properties of Legendre Polynomials
41- L38	Properties of Legendre Polynomials
42- L39	Properties of Legendre Polynomials
43- L40	Bessel functions
44- L41	Bessel functions
45- L42	Bessel functions
46- L43	Bessel functions
47- L44	The Gamma functions
48- L45	The Gamma functions
49- L46	The Gamma functions
50- L47	The Gamma functions
51- P3	**Department Seminar**
52- L48	Properties of Bessel functions
53- L49	Properties of Bessel functions
54- L50	Properties of Bessel functions
55- L51	Properties of Bessel functions
56-L52	**____ - Allotting portion for Internal Test-II**
	Internal Test II begins on 03-09-2018
57-L53	Linear systems
58-L54	Linear systems
59-IT-II	**Internal Test-II**
60- L55	Linear systems
61- L56	**____ - Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Linear systems
63- L58	Linear systems
64- L59	Problems
65- L60	Problems
66- L61	Problems
67- L62	Problems
68- L63	Homogeneous linear systems with constant coefficients
69- L64	Homogeneous linear systems with constant coefficients
70- L65	Homogeneous linear systems with constant coefficients
71- L66	Homogeneous linear systems with constant coefficients
72- L67	Homogeneous linear systems with constant coefficients
73- L68	Homogeneous linear systems with constant coefficients
74-P4	**College level meeting/ function**
75- L69	Homogeneous linear systems with constant coefficients

76- L70	Homogeneous linear systems with constant coefficients
77- L71	Homogeneous linear systems with constant coefficients
78- L72	Problem discussion
79- L73	**____ - Allotting portion for Internal Test-III**
	Internal Test III begins on 08-10-2018
80- L74	Problem discussion
81- L75	Revision
82-IT-III	**Internal Test-III**
83- L76	Revision
84- L77	**____ - Test Paper distribution and result analysis**
85- L78	Revision
	Entering Internal Test-III Marks into University portal
86- L79	**Model Testbegins on 22-10-2018**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course "Ordinary Differential Equation''
CO1	Students will be able to find the complete solution of a differential equationwith constant coefficients by variation of parameters.
CO2	Knowledge gained about Second Order linear equations and Power series solutions.
CO3	Acquisition of knowledge about Legendre polynomials, Bessel functions, The Gamma functions and Linear systems.
CO4	Students will have a working knowledge of basic application problem described by second order linear differential equations with constant coefficients.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Numerical Analysis
Course Code	PMAM15
Class	I year(2018-2019)
Semester	Odd
Staff Name	Mr. S. John Augastine
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

Numerical Analysis deals with numerical solutions of certain problems of Mathematics. In this course we study iterative methods to solve nonlinear equations in one variable, methods to solve system of equations, interpolation problems and Numerical solutions of differential equations.

Syllabus

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.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2018
1-L1	Unit I – Introduction to interpolation
2-L2	Newton's forward interpolation formula – Algorithm
3- L3	Problem discussion on Newton's forward interpolation formula
4-L4	Newton's backward interpolation formula
5-L5	Problem discussion on Newton's backward interpolation formula
6-L6	Central Difference Interpolation Formula

7-L7	Gauss forward interpolation formula
8-L8	Gauss backward interpolation formula
9-L9	Stirling's formula
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Bessel's Formula
12-L11	Laplace-Everett's formula
13-L12	Lagrange's interpolation formula
14-L13	Problems on Lagrange's interpolation formula
15-L14	Divided differences formulae; relation between divided differences and forward differences
16-L15	Newton's Divided differences formula
17-L16	Inverse interpolations: Lagrange's method, iterative method
18-L17	Hermite's Interpolating polynomial
19-L18	Unit II – Numerical differentiation: an introduction
20-L19	Derivatives using Newton's forward difference formula
21-L20	Derivatives using Newton's forward difference formula
22-L21	Problems to find derivatives using Newton's forward difference formula
23-L22	Problem discussion - **Allotting portion for Internal Test-I**
	Internal Test I begins on 30.07.2018
24-L23	Problems to find derivatives using Newton's forward difference formula
25-L24	Problems to find derivatives using Newton's forward difference formula
26-IT-1	**Internal Test-I**
27-L25	Derivatives using Newton's backward difference formula
28-L26	Derivatives using Newton's backward difference formula
29-L27	Problems to find derivatives using Newton's backward difference formula
30-L28	Derivatives using central difference formulae (Stirling's formula) - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Algorithm on derivatives using Stirling's formula
32- L30	Problems to find derivatives using Stirling's formula
33- L31	Maxima and minima of the interpolating polynomial
34-P2	**College level meeting/Cell function**
35- L32	Problems in maxima and minima of the interpolating polynomial
36- L33	Unit III – Introduction to Numerical integration
37- L34	Newton-Cote's quadrature formula
38- L35	Trapezoidal Rule
39- L36	Geometrical interpretation of Trapezoidal rule and Error in Trapezoidal rule
40- L37	Simpson's one third rule: Algorithm
41- L38	Finding truncation error in Simpson's formula
42- L39	Simpson's three eight rule: Algorithm
43- L40	Weddle's rule
44- L41	Romberg's method
45- L42	Problems on numerical integration
46- L43	Two-point Gaussian Quadrature formulae
47- L44	Gaussian three-point quadrature formula

48- L45	Trapezoidal rule for double integrals
49- L46	Simpson's one-third rule for double integrals
50- L47	Problems solving for double integrals
51- P3	**Department Seminar**
52- L48	Unit IV – Introduction to numerical solutions of ordinary differential equations
53- L49	Taylor's series method: Algorithm
54- L50	Problems on Taylors's series method
55- L51	Picard's iteration method
56-L52	Problems using Picard's iteration method – **Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
57-L53	Euler's algorithm
58-L54	Problems using Euler's method
59-IT-II	**Internal Test-II**
60- L55	Modified Euler's method
61- L56	Solving problems and comparing the difference in Euler's and Modified Euler's method - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Runge-Kutta method
63- L58	First order and second order Runge-Kutta method
64- L59	Problem discussion
65- L60	Third order and fourth order Runge-Kutta method
66- L61	Problems on Third order Runge-Kutta method
67- L62	Fourth order Runge-Kutta method
68- L63	Problems on fourth order Runge-Kutta method
69- L64	Unit V – Predictor corrector methods: introduction
70- L65	Milne's predictor method
71- L66	Problems using Milne's predictor method
72- L67	Milne's Corrector method
73- L68	Problems using Milne's corrector method
74-P4	**College level meeting/ function**
75- L69	Problem discussion on Milne's method
76- L70	Problem discussion on Milne's method
77- L71	Adams-Bashforth method: an introduction
78- L72	Adams-Bashforth predictor formula
79- L73	Problems using Adams-Bashforth predictor formula - **Allotting portion for Internal Test-III**
	Internal Test III begins on 08.10.2018
80- L74	Adams-Bashforth corrector formula
81- L75	Problems using Adams-Bashforth predictor formula
82-IT-III	**Internal Test-III**
83- L76	Problems using Adams-Bashforth method
84- L77	Problems discussion - **Test Paper distribution and result analysis**
85- L78	Problems using Adams-Bashforth method
	Entering Internal Test-III Marks into University portal

	Model Test begins on 22.10.2018
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Numerical Analysis"
CO1	Demonstrate understanding of common numerical methods and used to obtain approximate solutions to otherwise intractable mathematical problems
CO2	Analyse and evaluate the accuracy of common numerical methods
CO3	Compare different algorithms with respect to accuracy and efficiency solution
CO4	Analyse the errors obtained in the numerical solution of problems
CO5	Using appropriate numerical methods , determine the solutions to given non linear equations
CO6	Using appropriate numerical methods , determine approximate solutions to ordinary differential solutions
Integrated Activity	
IA1	Determine approximate numerical solutions to mathematical problems which can not always be solved by conventional analytical techniques
IA2	Demonstrate the important of selecting the right numerical technique for a particular application.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics

Course Name	Measure and Integration
Course Code	PMAM31
Class	II year (2018-2019)
Semester	Odd
Staff Name	P.Gino Metilda
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- Gain the knowledge of measure spaces and measure interruption
- Understanding the concept of lebesgue measure, lebesgue integration and signed measure
- To provide the understanding of general measure spaces

Syllabus

UnitI: **LebesgueMeasure:**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 – CantelliLemma.

Chapter 2 : Sec 2.1 – 2.5

Problems : Chapter 2 : 1 – 12 and 17

UnitII: **Lebesgue Measurable functions&Sequential pointwise Limits and related Theorems**: Lebesgue Measurable functions – Sums, Products and Compositions. Sequential pointwise Limits and Simple Approximation – Littlewood's Three Principles, Egoroff's Theorem and Lusin'sTheorem

Chapter 3 : Sec 3.1 - 3.3and

Problems :Chapter 3 : 1 – 3

Unit III: LebesgueIntegration : Lebesgue Integration – The Riemann Integral – The Lebesgue Integralofa bounded Measurable function over a set of finite measure – The Lebesgue integral of non-negative functions.

Chapter 4 : Sec 4.1 to 4.3

Unit IV: **Lebesgue Integral &Differentiablility**:The general Lebesgue Integral – Countable Additivity and Continuity of Integration. Differentiation and Integration – Continuity of monotone functions – Differentiability of monotone function: Lebesgue's theorem – Functions of bounded variations: Jordan's theorem.

Chapter 4 : Sec 4.4 & 4.5

Chapter 6 : Sec 6.1 - 6.3

UnitV: **Absolutely continuous functions &Signed Measures:** Absolutely continuous functions – Integrating Derivatives : Differentiating Indefinite Integrals. Measure and Integration – Measures and Measurable sets – Signed Measures : The Hahn and Jordan Decompositions – The Caratheodory measure induced by an outer measure – The construction of outermeasure

Chapter 6 : Sec 6.4 & 6.5

Chapter 17 : Sec : 17.1 - 17.4

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2018
1-L1	Unit I Introduction to Measure theory
2-L2	Definition of outer measure with examples
3- L3	Theorems in outer measure
4-L4	Theorems in outer measure
5-L5	Definition of Lebesgue measure and examples
6-L6	Theorems in Lebesgue measure
7-L7	Theorems in Lebesgue measure
8-L8	Theorems in Lebesgue measure
9-L9	Theorems in Lebesgue measure
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Outer an Inner approximation theorem
12-L11	Theorems in Lebesgue measure
13-L12	Countable additivity theorem
14-L13	Borel Canteli lemma
15-L14	Problems in Lebesgue measure
16-L15	Problems in Lebesgue measure
17-L16	Problems in Lebesgue measure
18-L17	Unit II Introduction to Lebesgue functions
19-L18	Theorems in Lebesgue functions
20-L19	Theorems in Lebesgue functions
21-L20	Introduction to sequential pointwise limits
22-L21	Theorems in Lebesgue functions

23-L22	Outer measure to Lebesgue function - **Allotting portion for Internal Test-I**
	Internal Test I begins on 30.07.2018
24-L23	Simple approximation theorem
25-L24	Little wood's three principle theorem
26-IT-1	**Internal Test-I**
27-L25	Little wood's three principle theorem
28-L26	Egoroff's theorem
29-L27	Egoroff's theorem
30-L28	**____ - Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Lusin Theorem
32- L30	Problems in Lebesgue functions
33- L31	Problems in Lebesgue functions
34-P2	**College level meeting/Cell function**
35- L32	Problems in Lebesgue functions
36- L33	Unit III Introduction on Lebesgue Integration
37- L34	Theorems in Lebesgue Integration
38- L35	Theorems in Lebesgue Integration
39- L36	Theorems in Lebesgue Integration
40- L37	Theorems in Riemann Integral
41- L38	Theorems in Riemann Integral
42- L39	Theorems in Riemann Integral
43- L40	Theorems in Riemann Integral
44- L41	Introduction to Lebesgue integral of measurable non negative function
45- L42	Theorems in Lebesgue integral of measurable non negative function
46- L43	Theorems in Lebesgue integral of measurable non negative function
47- L44	Theorems in Lebesgue integral of measurable non negative function
48- L45	Problems in Lebesgue functions
49- L46	Problems in Lebesgue functions
50- L47	Problems in Lebesgue functions
51- P3	**Department Seminar**
52- L48	Problems in Riemann Integral
53- L49	Unit IV Introduction of countable additivity and continuity of Integration
54- L50	Theorems in countable additivity and continuity of Integration
55- L51	Theorems in countable additivity and continuity of Integration
56-L52	Simple approximation theorem to Riemann integral- **Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
57-L53	Theorems in countable additivity and continuity of Integration
58-L54	Theorems in differentiation and Integration
59-IT-II	**Internal Test-II**
60- L55	Theorems in differentiation and Integration
61- L56	**____ - Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorems in differentiation and Integration

63- L58	Theorems in differentiation and Integration
64- L59	Theorems in differentiability of monotone function
65- L60	Theorems in differentiability of monotone function
66- L61	Lebesgue theorem
67- L62	Jordan’s theorem
68- L63	Jordan’s theorem
69- L64	Problems in the differentiability of monotone function
70- L65	Unit V Introduction to absolutely continuous functions
71- L66	Theorems inabsolutely continuous functions
72- L67	Theorems inabsolutely continuous functions
73- L68	Theorems inabsolutely continuous functions
74-P4	**College level meeting/ function**
75- L69	Theorems in differentiation and indefinite integration
76- L70	Theorems in differentiation and indefinite integration
77- L71	Introduction to measure and measurable sets
78- L72	Theorems in measure and measurable sets
79- L73	Theorems in differentiation and integration to measurable set- **Allotting portion for Internal Test-III**
	Internal Test III begins
80- L74	Theorems in signed measure
81- L75	Theorems in signed measure
82-IT-III	**Internal Test-III on 08.10.2018**
83- L76	Hahn- Decomposition theorem
84- L77	**____ - Test Paper distribution and result analysis**
85- L78	Construction of outer measure
	Entering Internal Test-III Marks into University portal
	Model Test begins on 22.10.2018
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01-11-2018

Course Outcomes

Learning Outcomes	**COs** of the course “Measure and Integration”
CO1	Knowledge gained about lebesgue theory
CO2	Solved problems using lebegue theory
CO3	Grt knowledge about their properties and constructions

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	TopologyI
Course Code	PMAM32
Class	II year (2018-2019)
Semester	Odd
Staff Name	Mr. Jeshua Rajan
Credits	4
L. Hours /P. Hours	6 / WK
Total 90 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 80 Hrs (5 units; 5×16=80; 16Hrs /unit)	

Course Objectives

- To distinguish space by means of Simple Topologicalinvariants.
- Gain the knowledge of constructing spaces by giving and to prove that incertain case, that the result is homeomorphic to standard spaces.
- Basic knowledge in Set Theory and Analysis at Undergraduatelevel.

Syllabus

UnitI: **Topological spaces :**Topological spaces – Basis fortopology – The order topology – The subspace topology- Closed sets and limitpoints.
Chapter 2: Sections: 12-14 and 16,17.
Problems: Section 13: 1, 4 and Section 16: 4, 6. Section 17: 1,11-13

UnitII: **Product topology :**The product topology on X × Y – Continuous functions – Product topology
Chapter 2: Section 15, 18,19.

Problems: Section 18: 2,3 and Section 19: 1-3.

UnitIII: **Metric Topology :**MetricTopology
Chapter 2: Section 20, 21
Problems: Section 20:1-3 and section 21:1, 2.

UnitIV: **Some spaces in topological spaces:**Connected spaces –Compactspaces.

Chapter 3: Sections: 23,26
Problems: Section 23: 2-4 and Section 26: 3, 6.

UnitV: **Compactness :**Limit point compactness – Localcompactness.
Chapter 3: Section 28,29.
Problems: Section 29:2,3.

Course Calendar

Hour allotment	Class Schedule
	Odd Semester Begin on 18.06.2018
1-L1	Unit I Introduction on topology
2-L2	Definition of Basis and examples
3- L3	Theorems in Basis
4-L4	Theorems in Basis
5-L5	Theorems in Basis
6-L6	Definition of Ordered Topology and Subspace Topology with examples
7-L7	Lemmas in subspace Topology
8-L8	Theorems in subspace Topology
9-L9	Definition and examples on closed set and closure of a set
10-P1	**Welcoming of First year and Inauguration of Mathematics Association**
11-L10	Theorems in closed set
12-L11	Theorems in closed set
13-L12	Definition of Interior of a set and limit point of a set with examples
14-L13	Theorems in limit point of a set
15-L14	Definition of Hausdorff space and examples
16-L15	Theorems in Hausdorff space
17-L16	Theorems in Hausdorff space
18-L17	Unit II Definition of Product Topology and examples
19-L18	Theorems in Product Topology
20-L19	Theorems in Product Topology
21-L20	Definition of Continuous functions with examples
22-L21	Theorems in Continuous functions
23-L22	Topology on Continuous functions - **Allotting portion for Internal Test-I**
	Internal Test I begins on 30.07.2018
24-L23	Definition of Homeomorphism and examples

25-L24	Theorems in Homeomorphism
26-IT-1	**Internal Test-I**
27-L25	The Pasting Lemma and examples
28-L26	Theorems in Product Topology
29-L27	Theorems in Product Topology
30-L28	Theorems in Product Topology - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
31- L29	Theorems in Product Topology
32- L30	Problems in Product Topology
33- L31	Problems in Product Topology
34-P2	**College level meeting/Cell function**
35- L32	Problems in Product Topology
36- L33	Unit III Definition of Metric spaces and examples
37- L34	Theorems in Metric Topology
38- L35	Theorems in Metric Topology
39- L36	Theorems in Metric Topology
40- L37	Theorems in Metric Topology
41- L38	Theorems in Metric Topology
42- L39	Theorems in Metric Topology
43- L40	Theorems in Metric Topology
44- L41	Problems in Metric Topology
45- L42	Problems in Metric Topology
46- L43	Problems in Metric Topology
47- L44	Problems in Metric Topology
48- L45	Problems in Metric Topology
49- L46	Problems in Metric Topology
50- L47	Problems in Metric Topology
51- P3	**Department Seminar**
52- L48	Problems in Metric Topology
53- L49	Unit IV Seperation axioms and the definition of the Connected space
54- L50	Examples for connected spaces
55- L51	Theorems in connected spaces
56-L52	Homeomorphism to connected spaces - **Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
57-L53	Theorems in connected spaces
58-L54	Theorems in connected spaces
59-IT-II	**Internal Test-II**
60- L55	Theorems in connected spaces
61- L56	Theorems in connected spaces - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
62- L57	Theorems in connected spaces
63- L58	Problems in connected spaces
64- L59	Problems in connected spaces
65- L60	Definition of Compact spaces and examples
66- L61	Theorems in connected spaces

67- L62	Theorems in connected spaces
68- L63	Problems in connected spaces
69- L64	Problems in connected spaces
70- L65	Unit V – Limit Point Compactness Theorem
71- L66	Limit Point Compactness Theorem
72- L67	Limit Point Compactness Theorem
73- L68	Problems in Limit Point Compactness Theorem
74-P4	**College level meeting/ function**
75- L69	Problems in Limit Point Compactness Theorem
76- L70	Problems in Limit Point Compactness Theorem
77- L71	Problems in Limit Point Compactness Theorem
78- L72	Problems in Limit Point Compactness Theorem
79- L73	Connected spaces to Limit point compactness- **Allotting portion for Internal Test-III**
	Internal Test III begins on 08.10.2018
80- L74	Some Exercise problems for revision
81- L75	Some Exercise problems for revision
82-IT-III	**Internal Test-III**
83- L76	Some Exercise problems for revision
84- L77	Some Exercise problems for revision - **Test Paper distribution and result analysis**
85- L78	Some Exercise problems for revision
	Entering Internal Test-III Marks into University portal
	Model test begins on 22.10.2018
86- L79	**Model Test**
87-MT	**Model Test**
88-MT	**Model Test**
89-MT	**Model test paper distribution and previous year university question paper discussion**
90-L-80	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Topology I"
CO1	Define the notion of limit of a function at agiven point and if there exists estimate the limit
CO2	Define the notion of metric space,construct the topology by using the metric and using this topology identify the continuity of the functions which are defined between metric.
CO3	Use the open ball on metric spaces, construct the metric topology and define open-closed sets of the space.
CO4	Define the notion of Topology
CO5	Define the subspace topology

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)d

(Prepared by staff member handling the course)

Programme Name	B. Sc Mathematics
Course Name	Advanced Algebra – I
Course Code	PMAM33
Class	II year (2018-2019)
Semester	Odd
Staff Name	Mr. C.Prabu Daniel Pakkianathan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

- To introduce some of the most fundamental algebraic structures like inner product space, dual space, etc.
- To know the relation between the expression of matrix and linear transformations.
- Explain some of the canonical forms: Triangular form, Nilpotent form and Jordan decomposition form.
- Introduce the notation of general matrix and its properties.
- To understand the concepts of normal, unitary, Hermitian, skew-Hermitian matrices.

Syllabus

MSU / 2017-18 / PG –Colleges / M.Sc.(Mathematics) / Semester -III / Ppr.no.14 / Core-13

Advanced Algebra I (75 Hours)

Prerequisites:

Basic knowledge in set theory and Matrix theory

Unit I:

Vector spaces: Dual spaces – Inner product spaces.

Sections: 4.3 and 4.4.

Unit II:

Linear transformations: The Algebra of linear transformations – Characteristic roots – Matrices.

Sections: 6.1 – 6.3.

Unit III:

Canonical Forms: Triangular form – Nilpotent form – Jordan form.

Sections: 6.4 - 6.6.

Unit IV:

Matrices: Trace and transpose – Determinants.

Sections: 6.8-6.9

Unit V:

Transformations: Hermitian, unitary and normal transformations.

Sections: 6.10(Up to Lemma 6.10.11)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begins on 18.06.2018
1-L1	Unit I – Introductory Class – Basic concepts of vector spaces, linearly independence and bases
2-L2	Linear transformation between vector spaces, Dual Spaces
3- L3	Basic Properties in dual space Hom(V, W)
4-L4	The Dual space
5-L5	Theorem of isomorphism between a vector space and its dual space
6-L6	Annihilator of a subspace in a vector space and its properties
7-L7	First isomorphism theorem on vector spaces
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Definition of inner product space and its examples
10- L9	Norm value of a vector and proof of Schwarz inequality
11-L10	Orthogonal property, orthogonal complement of a set, orthonormal set and necessary properties on it
12-L11	Gram-Schmidt Orthogonalization process and explanation using an example
13-L12	Unique representation of a vector space as a direct sum of subspace and its

	orthogonal complement
14-L13	Unit II – The algebra of linear transformations and definition of algebra and the notation $A_F(V)$=Hom(V, V).
15-L14	Cayley's theorem on algebra
16-L15	Polynomials over a field, minimal polynomials, roots of a polynomial in algebra and some theorems
17- L16	Singular elements and regular elements in A(V)
18- L17	Properties on singular and regular elements and invertible linear transformations
19- L18	Range and Rank of a linear transformation r(T) and its properties
20- L19	Problem discussion on rank
21- L20	Characteristic roots of a linear transformation on a finite-dimensional vector space over a field – **Allotting portion for Internal Test-I**
	Internal Test I begins (30.07.2018)
22- L21	Characteristic vectors of a linear transformation and some necessary conditions on it
23- IT-1	**Internal Test-I**
24- L22	Matrix representation of a linear transformation with respect to basis elements
25- L23	Illustrate the matrix representations of differentiable operator with respect to different bases
26- L24	Defining the generalized matrix and its properties –**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Algebra isomorphism between A(V) and F_n by T – > m(T)
28- L26	Similarities between matrices of a linear transformation T with respect to different bases
29- L27	Unit III –Canonical form: 1 Triangular form, similarities between linear transformations, invariant space under T
30- P2	**College level meeting/Cell function**
31-L28	Sufficient condition for a matrix of T to be triangular (in terms of characteristic roots of matrix)
32-L29	Structure of the polynomial of T which is in triangular form
33-L30	Canonical form: 2 Nilpotent transformations,
34- L31	Matrix of linear transformation T with respect to the decomposition of V
35- L32	Index of nilpotence; the general structure of the matrix of a nilpotent transformation
36- L33	Existence of invariant subspace of a vector space V that decompose V.
37- L34	Necessary and sufficient condition for two nilpotent transformation to be similar.
38- L35	Canonical form: 3 Jordan Form (Jordan decomposition of a finite-dimensional vector space)
39- L36	Structure of a minimal polynomial of T_i on V_i where V is the direct sum of V_i's where i > 1.
40- L37	Jordan block belonging to characteristic roots, Jordan canonical form and its matrix
41- L38	Necessary and sufficient condition for that a linear transformation can be brought to the same Jordan form
42-P3	**Department Seminar**
43- L39	Unit IV – Trace of a matrix, properties of linearity and commutativity when trace is considered as functions on F_n

44- L40	Trace of a linear transformations, trace of T is as the sum of its characteristic roots
45- L41	Jacobson Lemma and a sufficient condition for a linear transformation T to be nilpotent (using trace of T)
46- L42	Transpose of a matrix and its elementary properties
47- L43	Symmetrix matrix and Skew-symmetric matrix – **Allotting portion for Internal Test-II**
	Internal Test II begins (03.09.2018)
48- L44	Adjoint of a matrix on F_n – Hermitian and skew-Hermitian matrices
49-IT-II	**Internal Test-II**
50-L45	Determinants of a matrix – defining procedure
51- L46	Some elementary properties on determinants–**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
52- L47	Vanishing the determinant value of a matrix that have two rows/columns are equal
53- L48	Determinant of invertible matrix and product of matrices
54- L49	Cramer's rule; necessary and sufficient condition for a matrix to be a invertible matrix
55- L50	Secular equation of a matrix and its existence for every matrix – Cayley-Hamilton Theorem
56- L51	Unit V –Unitary linear transformation - definition using inner products
57- L52	Necessary and sufficient condition for a transformation to be unitary (using orthonormal basis)
58- L53	The motivation theorem for adjoint; Hermitian adjoint of a linear transformation
59-P4	**College level meeting/ function**
60- L54	Elementary properties of Hermitian adjoint of T
61- L55	Hermitian(self-adjoint) and skew-Hermitian linear transformation
62- L56	Characteristic roots of any Hermitian transformation is real – proof argument
63- L57	Normal linear transformation
64- L58	Characteristic roots of Normal transformations – **Allotting portion for Internal Test-III**
	Internal Test III begins (08.10.2018)
65- L59	Relation between a normal transformation and its Hermitian adjoint. Relation between the characteristic roots of a normal transformation and its Hermitian adjoint
66- L60	Relation between distinct characteristic vectors belonging to distinct characteristic roots of a normal transformation – Arguments
67-IT-III	**Internal Test-III**
68- L61	Diagonalization process in the matrix of normal/unitary/Hermitian transformations
69- L62	Necessary and sufficient conditions for a normal transformation N to be a Hermitian (or Unitary) transformation
70- L63	Commutative property in normal matrix and its adjoints– **Test Paper distribution and result analysis**
	Model Test begins (22.10.2018)
	Entering Internal Test-III Marks into University portal
71-MT	**Model Test**
72-MT	**Model Test**

73-MT	**Model Test**
74-L64	**Model test paper distribution and previous year university question paper discussion**
75-L65	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Advanced Algebra – I"
CO1	Able to asses properties implied by the definitions of groups and rings
CO2	Student can understand the notion of Dual Spaces.
CO3	Student can understand the algebra of Linear transformations.
CO4	Can easily explain about the fundamental algebraic structures like inner product space, linear transformations, dual space,etc.
CO5	Describe the relation between the expression of matrix and linear transformations.
CO6	Can able to discuss about characteristic roots and its characteristic vectors
CO7	Gained knowledge about the standard canonical forms, called as Triangular form, Nilpotent form and Jordan decomposition form.
CO8	Studied several properties of matrices and its determinants
CO9	Understand the concepts of normal, unitary, Hermitian, skew-Hermitian matrices as well as linear transformations
Experimental Learning	
EL1	Students are motivated to solve CSIR-NET questions depending upon matrix theory, especially trace, transpose.
EL2	Theory on Determinant matrices are induced to study with the help of examples
EL3	Gram-Schmidt Orthogonalization process can understand by integral and differential operators
Integrated Activity	
IA1	Demonstrate about the page rank using in Google – Application of Characteristic roots
IA2	Use technological tools such as computer algebra systems or graphing calculators for visualization and calculation of linear algebra concepts

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John’s College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2019-2020)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Operations Research
Course Code	**PMAM34**
Class	II year (2018-2019)
Semester	Odd
Staff Name	Dr. R. Murugesan
Credits	4
L. Hours /P. Hours	5 / WK
Total 75 Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 65 Hrs (5 units; 5×13=65; 13Hrs /unit)	

Course Objectives

This course deals with network models, dynamic and integer programming, inventory and queuing theory, nonlinear programming, and provide the mathematical basis behind these techniques. The aim of this course is to help the students to understand and apply some of the widely used techniques of Operations Research.

Syllabus

Operations Research (75 Hours)

Unit I: Transportation Models And Its Variants: Definition Of The Transportation Model – Nontraditional 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.

Chapter 11 – Sections 11.1, 11.2, 11.3, Chapter 16 – Sections 16.1, 16.2 and Exercise problems.

Unit V: Queuing Theory: Basic Elements Of Queuing Model – Role Of Poisson And Exponential Distributions – Pure Birth And Death Models – Specialised Poisson Queues

Chapter 17 – Sections 17.2, 17.3, 17.4, 17.6(upto 17.6.3) and Exercise problems.

Text Book:

1. Operations Research(Sixth Edition) , Hamdy A. Taha, Prentice Hall Of India Private Limited, New Delhi.

Books for Reference:

1. Introduction to Operations Research – Fredrick, Shiller, GenraldJ.Literman – MC Graw Hill (2017)

2. Operations Research – KantiSwarup, P.K. Gupta, Man Mohan – Sultan Chand and sons. (2016)

3. Operations Research (Fifth edition) J.N Sharma, McMillian Publications (2013)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18.06.2018
1-L1	Introduction
2-L2	Transportation Models And Its Variants: Definition Of The Transportation Model
3- L3	Transportation Models And Its Variants: Definition Of The Transportation Model
4-L4	Transportation Models And Its Variants: Definition Of The Transportation Model
5-L5	Transportation Models And Its Variants: Definition Of The Transportation Model
6-L6	Nontraditional Transportation Model
7-L7	Nontraditional Transportation Model
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Nontraditional Transportation Model

10- L9	Transportation Algorithm
11-L10	Transportation Algorithm
12-L11	Transportation Algorithm
13-L12	The Assignment Model
14-L13	The Assignment Model
15-L14	The Assignment Model
16-L15	Network Analysis: Network Definitions
17- L16	Network Analysis: Network Definitions
18- L17	Minimal Spanning Tree Algorithm
19- L18	Minimal Spanning Tree Algorithm
20- L19	Minimal Spanning Tree Algorithm
21- L20	Problem discussions - **Allotting portion for Internal Test-I**
	Internal Test I begins30.07.2018
22- L21	Shortest Route Problem
23- IT-1	**Internal Test-I**
24- L22	Shortest Route Problem
25- L23	Maximum Flow Model
26- L24	**Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
27- L25	Maximum Flow Model
28- L26	CPM
29- L27	CPM
30- P2	**College level meeting/Cell function**
31-L28	PERT
32-L29	PERT
33-L30	Integer Linear Programming: Introduction
34- L31	Integer Linear Programming: Introduction
35- L32	Integer Linear Programming: Introduction
36- L33	Applications
37- L34	Applications
38-L35	Integer Programming Solutions
39- L36	Integer Programming Solutions
40- L37	Integer Programming Solutions
41- L38	Algorithms
42-P3	**Department Seminar**
43- L39	Algorithms
44- L40	Inventory Theory: Basic Elements Of An Inventory Model
45- L41	Inventory Theory: Basic Elements Of An Inventory Model
46- L42	Inventory Theory: Basic Elements Of An Inventory Model
47- L43	Problem discussions - **Allotting portion for Internal Test-II**
	Internal Test II begins03.09.2018
48- L44	Deterministic Models: Single Item Stock Model With And Without Price Breaks
49-IT-II	**Internal Test-II**
50-L45	Deterministic Models: Single Item Stock Model With And Without Price Breaks
51- L46	**Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal

52- L47	Multiple Items Stock Model With Storage Limitations
53- L48	Multiple Items Stock Model With Storage Limitations
54- L49	Probabilistic Models
55- L50	Probabilistic Models
56- L51	Continuous Review Model
57- L52	Continuous Review Model
58- L53	Continuous Review Model
59-P4	**College level meeting/ function**
60- L54	Queuing Theory: Basic Elements Of Queuing Model
61- L55	Queuing Theory: Basic Elements Of Queuing Model
62- L56	Role Of Poisson And Exponential Distributions
63- L57	Role Of Poisson And Exponential Distributions
64- L58	Problem discussions - **Allotting portion for Internal Test-III**
	Internal Test III begins08.10.2018
65- L59	Pure Birth And Death Models
66- L60	Pure Birth And Death Models
67-IT-III	**Internal Test-III**
68- L61	Specialised Poisson Queues
69- L62	Specialised Poisson Queues
70- L63	**Test Paper distribution and result analysis**
71-MT	**Entering Internal Test-III Marks into University portal**
72-MT	**Model Test22.10.2018**
73-MT	**Model Test**
74-L64	**Model Test**
75-L65	**Model test paper distribution and previous year university question paper discussion**
	Feedback of the Course, analysis and report preparation
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Operations Research"
CO1	To modify real life into Standard Mathematical Models.
CO2	To learn different optimization techniques.
CO3	To know classification of different structured problems.
CO4	Basic computing knowledge and techniques at undergraduate level.
CO5	Identification of actual problems and its equivalent mathematical models.
CO6	Application to different optimization techniques in real life situations.
CO7	Knowledge gained in utilization of Optimum Resources.

# Blended Learning	: using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,
# For Advanced Learner	: use library books, E- books, motivate student to prepare for higher study.
# For slow learner	: special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.
# Extension activity	: Motivate student to take classes for school students.

HOD Signature   Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc Mathematics
Course Name	Research Methodology
Course Code	PMAM35
Class	II year (2018-2019)
Semester	Odd
Staff Name	S. John Augastine
Credits	4
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3 Hrs Dept. Meetings-2 Hrs College Meetings-2 Hrs Remaining 50 Hrs (5 units; 5×10=50; 10Hrs /unit)	

Course Objectives

- To understand the Basic aspects in research
- To learn Mathematical and Statistical technique for research
- To acquire basic knowledge about various instruments and techniques in Mathematical research.

Syllabus

MSU / 2017-18 / PG –Colleges / M.Sc.(Mathematics) / Semester -III

Research Methodology

Unit I : Research Project

Research Project – Difference between a dissertation and a thesis– Basic requirements of a research degree –Writing a proposal –Ethical considerations

Unit II : Components of a Research Project

Different components of a research project–Literature review – Methodology – Results / data – Conclusions – Bibliography - Appendices.

Unit III : Some Special Distributions

The Gamma and Chi – Square distribution – The normal distribution

Unit IV : Sampling Theory

Transformation of variables – t & F distributions.

Unit V : Random variables

The MGF technique – Distributions of $\bar{X}$ and $\frac{ns^2}{\sigma^2}$ - Expectations of functions of random variables-The Central Limit Theorem.

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2018
1-L1	UNIT I : RESEARCH PROJECT – Introduction - Research Project
2-L2	Explaining about dissertation
3- L3	Explaining about a thesis
4-L4	Difference between a dissertation and a thesis
5-L5	Basic requirements of a research degree
6-L6	Discuss about originality
7-L7	Other requirements of the thesis
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9- L8	Writing a proposal
10- L9	Format of a proposal
11-L10	Ethical considerations
12-L11	UNIT II : COMPONENTS OF A RESEARCH PROJECT –General introduction
13-L12	Different components of a research project
14-L13	Preliminary section, Body of the work, Supporting sections
15-L14	Title page - **Allotting portion for Internal Test-I**
	Internal Test I begins ON 30.07.2018
16-L15	Abstract of the project
17-IT-1	**Internal Test-I**
18-L16	Acknowledgement Section
19-L17	List of contents - **Test Paper distribution and result analysis**
	Entering Internal Test-I Marks into University portal
20-L18	Literature review
21- L19	Methodology – Results / data
22- P2	**College level meeting/Cell function**
23-L20	Conclusions – Bibliography - Appendices.

24-L21	UNIT III : SOME SPECIAL DISTRIBUTIONS –Introduction to distributions
25-L22	Gamma distribution – Mean ,Variance and MGF
26-L23	Problems on gamma distribution
27-L24	Derivation of Normal distribution
28-L25	Normal distribution – Mean ,Variance and MGF
29-L26	Properties of Normal distribution
30-L27	Problems on Normal distribution
31-L28	Derivation of Chi-square distribution
32-L29	Chi-square distribution – Mean ,Variance and MGF
33-L30	Problems on Chi-square distribution
34- P3	**Department Seminar**
35-L31	UNIT IV : SAMPLING THEORY – Introduction to transformation of variables
36-L32	Distribution of functions of random variables **- Allotting portion for Internal Test-II**
	Internal Test II begins on 03.09.2018
37- L33	Random samples
38- IT-II	**Internal Test-II**
39-L34	Problems on Random samples
40-L35	Transformation of variables of the discrete type **- Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L36	Problems on Transformation of variables of the discrete type
42- L37	Transformation of variables of the continuous type
43- L38	Problems on Transformation of variables of the continuous type
44- P4	**College level meeting/ function**
45-L39	Derivation of t-distribution and problems
46-L40	Derivation of F-distribution and problems
47-L41	UNIT V : RANDOM VARIABLES – Introduction
48-L42	The MGF Technique
49-L43	Problems on MGF technique
50-L44	Distributions of $\bar{X}$ and$\frac{ns^2}{\sigma^2}$**- Allotting portion for Internal Test-III**
	Internal Test III begins on 08.10.2018
51 L45	Problems on$\bar{X}$ and$\frac{ns^2}{\sigma^2}$
52- L46	The Central Limit Theorem
53-IT-III	**Internal Test-III**
54-L47	Expectations of functions of random variables
55-L48	Problems onExpectations of functions of random variables **- Test Paper distribution and result analysis**
	Entering Internal Test-III Marks into University portal
56- MT	**Model Test**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**

60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Research Methodology"
CO1	Training and participating in active research activities for their academic and professional levels.
CO2	Creation of novel ideas and simple technique useful to society(R/D)
CO3	Acquire background knowledge in research publication and thesis writing.
CO4	Develop skills in quantitative data analysis and presentation
CO5	Develop advanced critical thinking skills
Integrated Activity	
IA1	Preparing a thesis model
IA2	Able to understand graphical representations and statistical information in media and daily life

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

For slow learner : special care taken, motivate the advanced learner to support the slow learner to study.To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal

St. John's College, Palayamkottai

Department of Mathematics

COURSE ACADEMIC PLAN (2018-2019)

(Prepared by staff member handling the course)

Programme Name	M. Sc (Mathematics)
Course Name	Calculus of Variations and Integral Equations.
Course Code	PMAE32
Class	II year (2018-2019)
Semester	Odd
Staff Name	Mr. R. Arul Ananthan
Credits	3
L. Hours /P. Hours	4 / WK
Total 60Hrs/Sem Internal Test-3 Hrs Model Test-3Hrs Dept. Meetings-0Hrs College Meetings-0Hrs Remaining 54Hrs (5 units; 5×10.8=54; 10.8Hrs /unit)	

Course Objectives

- The objective of this paper is to place at the disposal of the student, the basis of an intelligent working knowledge of a number of facts and techniques which are useful in varied fields of application.
- To impart analytical ability in solving variational problems and Integral equation.
- To acquire the knowledge of solving problems in the fields of mechanics and mathematical physics.

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Mathematics) / Semester – III / Elective-2(b)

CALCULUS OF VARIATIONS AND INTEGRAL EQUATIONS

UNIT I -Maxima and Minima

Calculus of Variations and Applications– Maxima and Minima– The simplest case– Illustrative examples.

Exercises problems: Chapter 2(2, 6, 8 and 18)
Sections: 2.1-2.4
UNIT II-Lagrange's Multipliers
Thevariational notations– The more general case – Constraints and Lagrange'sMultipliers – Variable end points.
Exercises problems: Chapter 2(19, 20 and 21)
UNIT III - Integral Equations
Integral Equations – Introduction –Relation between differential and integral equations – The Green's function.
Exercises problems: Chapter 3(1,9, 11)
UNIT IV - Fredholm equations
Linear Equations in cause and effect- The influence function -Fredholm equations with separable kernels – Illustrative Examples.
Exercises problems: Chapter 3(40 and 43)
Unit V - Hilbert Schmidt theory
Hilbert Schmidt theory – Iterative methods for solving equations of second kind.
Exercises problems: Chapter 3(52 and 53)

Course Calendar

Hour allotment	**Class Schedule**
	Odd Semester Begin on 18-6-2018
1-L1	Unit –I -Introduction of calculus of variation. And explain the concept of maxima and minima.
2-L2	Definition of maxima and minima and some examples.
3- L3	Derivation of maxima and minima for several variabels.
4-L4	Explain the simplest case- Euler equation.
5-L5	Derivation of various forms of euler equation.
6-L6	Solutions of euler equation and problems.
7-L7	Examples and some problems related to euler equation.
8-L8	Problems of an euler equation.
8- P1	**Welcoming of First year and Inauguration of Mathematics Association**
9-L9	Explain natural boundary conditions.
10-L10	Natural boundary conditions derivations.
11-L11	Transition problems derivations. And excersise problems **Seminar by student.**
12-L12	Unit- II- Introduction to variational notation
13-L13	Variational notations derivations.
14-L14	Continuation of Variational notations derivations.
15-L15	Problems related to Variational notations. - **Allotting portion for Internal Test-I.**
	I internal test begins on 30.07.2018
16-L16	Variational notations problems continued.
17-IT-1	**Internal Test-I**
17-L17	Introduction to more general case.
18-L18	Derivation of ostrogradsky equation. - **Test Paper distribution and result**

	analysis
	Entering Internal Test-I Marks into University portal
19-L19	Derivation of ostrogradsky equation continued.
20-L20	Problems related to the more general case.
21-L21	Introduce the concept of Constraints and Lagrange multipliers.
22- P2	**College level meeting/Cell function**
22-L22	Derivations of Lagrange multipliers.
23-L23	Problems of Lagrange multipliers.
24-L24	Problems of Lagrange multipliers. And Unit Test
25-L25	Derivation and problems of variable end points
26-L26	Exercise problems.
27-L27	Variable end points continuation.
29-L28	Variable end points continuation.
30-L29	Unit-III – Introduction to Integral equation
31-L30	Explain the types of integral equations**.**
32-L31	Explain the fredholm integral equations.
33-L32	Explain the volterra integral equations.
34- P3	**Department Seminar**
35-L34	Volterra integral equations continued.
36-L35	Introduction to Green's function. - **Allotting portion for Internal Test-II**
	Internal Test II begins on 30.09.2018
37-L36	Properties of Green's function.
38- IT-II	**Internal Test-II**
38-L37	Green's function derivation.
39-L38	Problems on Green's function.
40-L39	Problems on Green's function continued. - **Test Paper distribution and result analysis**
	Entering Internal Test-II Marks into University portal
41-L40	Introduction to Bessel equation.
42-L41	Problems on Bessel equation.
43-L42	UNIT –IV- Introduction to Influence function.
44- P4	**College level meeting/ function**
45-L43	Problems on Influence function.
46-L44	Explain about separable kernel and examples, and theorems related to separable kernels.
47-L45	Illustrative examples related to separable kernel. **- Test Paper distribution and result analysis**
48-L46	Illustrative examples related to separable kernel.
49-L47	UNIT - V – Introduction to Hilbert – Schmidt theory
50-L48	Some theorems related to Hilbert – Schmidt theory **Allotting portion for Internal Test-III**
	Internal Test III begins on 08.10.20189
51-L49	Derivation related to Hilbert Schmidt theory.
52-L50	Derivation of nonhomogeneous Fredholm equation of the second kind.
53-L51	Continuation of derivation of nonhomogeneous Fredholm equation of the second kind. **Model Test Announcement.**
53-IT-III	**Internal Test-III**

54-L52	Problems related to Hilbert Schmidt theory. Over all view of the course by PPT
55-L53	Problems related to Hilbert Schmidt theory. - **Test Paper distribution and result analysis**
	Model Test begins on 22.10.2018
56- MT	**Model Test**
57-MT	**Model Test**
58-MT	**Model Test**
59- L49	**Model test paper distribution and previous year university question paper discussion**
60-L50	**Feedback of the Course, analysis and report preparation**
	Last Working day on 01.11.2018

Course Outcomes

Learning Outcomes	**COs** of the course "Calculus Of Variations And Integral Equations"
CO1	Fully understand the properties of geometrical problems.
CO2	Be familiar with variational problems.
CO3	Be familiar isoperimetric problems.
CO4	Be through with different types of integral equations.
CO5	Students will be able to recognize difference between Volterra and Fredholm integral equation, First kind, Second kind, Homogenous and etc.
CO5	Be exposed to the successive approximation method.
Experimental Learning	
EL1	To do working models to explain functionals.
EL2	To collect, categoriesproblems using lagrange multipliers and constraints.
Integrated Activity	
IA1	Prepare chart forEuler equations.
IA3	Prepare chart for integral equations.
IA2	How calculus of variation used in day-today life.

Blended Learning : using PPT, video, library resources, ICT techniques, E-learning resources, Google classroom, study tour, etc.,

For Advanced Learner : use library books, E- books, motivate student to prepare for higher study.

Forslow learner : special care taken, motivate the advanced learner to support the slow learner to study. To attend the remedial classes.

Extension activity : Motivate student to take classes for school students.

HOD Signature Staff Signature

Principal