RATHNAVEL SUBRAMANIAM COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
SULUR, COIMBATORE-641402

DEPARTMENT OF MATHEMATICS

B. Sc MATHEMATICS

Syllabus effective for the students admitted during the Academic Year 2017 -2018 Batch onwards

(2017-2020)

HOD **PRINCIPAL** **COE**

PROGRAMME OUTCOMES (POs):

PO1	Graduates can have strong fundamentals in their specific discipline along with Digital Strategic knowledge.
PO2	To increase student's ability to communicate effectively with the community /society in verbal /written language to give or receive clears instruction.
PO3	To enhance their ability to understand and identify the professional and ethical responsibilities.
PO4	To enrich their personality and character development.

PROGRAMME SPECIFIC OUTCOMES: (PSOs)

Upon completion of Bachelor of Mathematics Degree, STUDENTS are able to achieve the following outcomes.

PSO1	Investigate and apply Mathematical problems and solutions in a variety of contexts related to the field of Data Analyst, Market Research Analyst, Software Engineer, Professional Engineers in the department of Navy, Data Scientist, Physicists and Astronomers, Structural Dynamic Engineer and Research Engineer - Efficacy Engineering.
PSO2	To implant the capacity to apply the concepts of Calculus, Linear Algebra, Statistics, Differential Equations and Laplace Transforms, Operations Research, Numerical Methods, Latex and Mat Lab etc in development and implementation of application oriented.
PSO3	Develop an understanding of the underlying unifying structures of Graph Theory, Analytical Geometry, Trigonometry and Vector Calculus, Dynamics and Discrete Mathematics.
PSO4	Develop and understand the value of proof, the single factor that distinguishes from the courses such as Classical Algebra, Modern Algebra and Complex Analysis and demonstrate proficiency in writing and understanding proofs.

GRADUATE ATTRIBUTES

- DISIPLINE KNOWLEDGE
- PROBLEM ANALYSIS
- CRITICAL THINKING
- MODERN TOOLS USAGE
- SOFT SKILLS
- SELF LEARNING
- LIFE LONG LEARNING
- INDIVIDUAL & TEAM WORK
- PROJECT MANAGEMENT & FINANCE

RATHNAVEL SUBRAMANIAM COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
Affiliated to Bharathiar University, Coimbatore-641 402

SCHEME OF EXAMINATION – CBCS PATTERN

PROGRAMME: B. Sc (Mathematics)
(Effective from the Academic year 2017-2018)

Credits & Marks Distribution

Sl. No.	Course Type	Number of Courses	Credits	Marks	Total Credits
1	Multi Indian/ International Languages	2	4	200	8
2	Ability Enhancement Compulsory Courses – I & II : Group-I (English)	2	4	200	8
3	Ability Enhancement Compulsory Courses – II & IV: Group-II	2	1+3	200	4
4	Discipline Specific Courses	12	6	1200	72
5	Discipline Specific Elective Courses	4+1	6	500	30
6	Extra Disciplinary Course (EDC)	1	6	100	6
7	Skill Enhancement Courses	2 + 1	4	200	8
8	ALCTA– e Learning in MOOC platform	1	4*	Completion	4*
9	Non Credit Courses – Group I	2	-	Grade	-
10	Non Credit Courses – Group II	6	-	Grade	-
11	Non Credit Courses – Group III	4	-	Completed	-
Total				**2600**	**136 + 4***

Multi-Indian/ International Languages								
Course	**Course Name**	**L**	**T**	**P**	**CIA**	**SEE**	**Total**	**Credits**
Two courses - Any **one** group								
Group I								
MIL-I	Tamil I	6	-	-	25	75	100	4
MIL-II	Tamil II	6	-	-	25	75	100	4
Group II								
MIL-I	Hindi I	6	-	-	25	75	100	4
MIL-II	Hindi II	6	-	-	25	75	100	4
Group III								
MIL-I	Malayalam I	6	-	-	25	75	100	4
MIL-II	Malayalam II	6	-	-	25	75	100	4
Group IV								
MIL-I	French I	6	-	-	25	75	100	4
MIL-II	French II	6	-	-	25	75	100	4
Group V								
MIL-I	Arabic I	6	-	-	25	75	100	4
MIL-II	Arabic II	6	-	-	25	75	100	4
Total							**200**	**8**

Ability Enhancement Compulsory Courses (AECC) - Group I : (I & II Sem)								
AECC – G1-I	English-I- Grammar and usage	6	-	-	25	75	100	4
AECC – G1-II	English-II – Communicative English	6	-	-	25	75	100	4
Total							**200**	**8**

Ability Enhancement Compulsory Courses (AECC) - Group II : (II & IV Sem)								
AECC – G2-I	Environmental Studies	1	-	-	100	-	100	1
AECC – G2-II	Aptitude	3	-	-	100	-	100	3
Total							**200**	**4**

Discipline Specific Courses (DSC)								
DSC – I	Statistics-I	5	1		25	75	100	6
DSC – II	Classical Algebra	5	1		25	75	100	6
DSC – III	Calculus	5	1		25	75	100	6
DSC – IV	Statistics-II	4		4	25 40	75 60	100	6
DSC – V	Analytical Geometry	4		4	25 40	75 60	100	6
DSC – VI	Trigonometry and Vector Calculus	4		4	25 40	75 60	100	6
DSC – VII	Mechanics	4		4	25 40	75 60	100	6
DSC –VIII	Differential Equations and Laplace transforms	4		4	25 40	75 60	100	6
DSC – IX	Modern Algebra	5	1		25	75	100	6
DSC – X	Real Analysis	5	1		25	75	100	6
DSC – XI	Complex Analysis	5	1		25	75	100	6
DSC – XII	Elementary Number Theory	5	1		25	75	100	6
Total							**1200**	**72**

Discipline Specific Elective Courses (DSE) I : (III Sem)								
Course	**Course Name**	**L**	**T**	**P**	**CIA**	**EoS**	**Total**	**Credits**
One course – From the group								
DSE –I	Numerical Methods	4		4	25 40	75 60	100	6
DSE –I	Astronomy-I	5	1		25	75	100	6
Total							**100**	**6**

Discipline Specific Elective Courses (DSE) II : (IV Sem)								
Course	**Course Name**	**L**	**T**	**P**	**CIA**	**EoS**	**Total**	**Credits**
One course – From the group								
DSE – II	Operations Research	5	1		25	75	100	6
DSE –II	Astronomy-II	5	1		25	75	100	6
Total							**100**	**6**

Discipline Specific Elective Courses (DSE) III : (V Sem)								
Course	**Course Name**	**L**	**T**	**P**	**CIA**	**EoS**	**Total**	**Credits**
One course –From the group								
DSE –III	Linear Algebra	4		4	25 40	75 60	100	6
DSE –III	Latex	4		4	25 40	75 60	100	6
Total							**100**	**6**

Discipline Specific Elective Courses (DSE) IV: (VI Sem)								
Course	**Course Name**	**L**	**T**	**P**	**CIA**	**EoS**	**Total**	**Credits**
One course –From the group								
DSE –IV	Discrete Mathematics	4		4	25 40	75 60	100	6
DSE –IV	Mat Lab	4		4	25 40	75 60	100	6
Total							**100**	**6**

Discipline Specific Elective Courses (DSE) V: (VI Sem)								
DSE -V	Project Work & Viva Voce	6			40	60	100	6
Total							**100**	**6**

Discipline Specific Elective Courses (DSE) : (V Sem)								
Extra Disciplinary Course : (EDC)								
Any one Course from the following								
EDC	Commercial Correspondence	5	1		25	75	100	6
EDC	Entrepreneurship	5	1		25	75	100	6
EDC	Project Management	5	1		25	75	100	6
EDC	Insurance and Risk Management	5	1		25	75	100	6
EDC	Social Media Marketing	5	1		25	75	100	6
EDC	E-Commerce	5	1		25	75	100	6
EDC	Indian Tax System	5	1		25	75	100	6
EDC	Digital marketing	5	1		25	75	100	6
EDC	Java Script and JQuery	5	1		25	75	100	6
EDC	Web Designing	5	1		25	75	100	6
EDC	Cyber Security	5	1		25	75	100	6
EDC	Hospitality Management	5	1		25	75	100	6
EDC	Fundamentals of Digital Computers	5	1		25	75	100	6
EDC	Computational Mathematics	5	1		25	75	100	6
EDC	Health Management	5	1		25	75	100	6
EDC	Forensic Science	5	1		25	75	100	6
EDC	Microbes – Health & Disease	5	1		25	75	100	6
EDC	Health & Life Style Disorders	5	1		25	75	100	6
							100	**6**

Skill Enhancement Courses : Group I (III & IV Sem)								
SEC –G1– I	Communicative Skills-I	2			50	-	50	2
SEC –G1– II	Communicative Skills-II	2			50	-	50	2
Total							**100**	**4**

Skill Enhancement Courses : Group II (V Sem)								
Course	**Course Name**	**L**	**T**	**P**	**CIA**	**EoS**	**Total**	**Credits**
Any **one** group								
Group A								
SEC –G2-A-I	Placement - College to Corporate -I	2			50	-	50	2
SEC –G2-A-II	Placement - College to Corporate -II	2			50	-	50	2
Group B								
SEC –G2-B	Comprehensive Mathematics	4			100	-	100	4
Total							**100**	**4**

Non Credit Course – Group I (III & IV Sem)			
NCC-G1-I	Career Skills-I	RVS Training Academy	Grade
NCC-G1-II	Career Skills-II	RVS Training Academy	Grade

Non Credit Course – Group II (COP)										
Semester	Course Opted	Course Name	D	L	T	P	CIA	SEE	Marks	Credits
I	NCC-G2-I	Applied Mathematics-I	3	1	-	-	25	75	100	-
II	NCC-G2-II	Applied Mathematics-II	3	1	-	-	25	75	100	-
III	NCC-G2-III	Applied Mathematics-III	3	1	-	-	25	75	100	-
IV	NCC-G2-IV	Applied Mathematics-IV	3	1	-	-	25	75	100	-
V	NCC-G2- V	Applied Mathematics-V	3	1	-	-	25	75	100	-
VI	NCC-G2-VI	Project and Viva voce	3	1	-	-	25	75	100	-

Non Credit Course – Group III (I – IV Sem)			
Any 1 Course			
NCC – G III	National Service Scheme	NSS	Completion
	National Cadet Corps	NCC	Completion
	Sports	Physical Education	Completion
	Literacy & Cultural Club	Language Department	Completion
	Youth Red Cross /Red Ribbon Club	YRC	Completion
	Fine Arts Club	Language Department	Completion

Extra Optional Credit Course (ALCTA)			
Any 1 Course with 4 extra credits			
I – VI Semester	*e-Learning in MOOC Platform	*4 CREDITS	Completion

SCHEME OF EXAMINATIONS

B. Sc., MATHEMATICS 2017- 2018 BATCH

Semester	Course Opted	Course Name	D	L	T	P	CIA	ES	Marks	Credits
I	MIL-I	Tamil-I/Hindi-I/Malayalam-I/French-I/Arabic-I	3	6	-	-	25	75	100	4
	AECC-G1-I	English-I (Grammar and Usage)	3	6	-	-	25	75	100	4
	DSC – I	Statistics -I	3	5	1		25	75	100	6
	DSC – II	Classical Algebra	3	5	1		25	75	100	6
	DSC – III	Calculus	3	5	1		25	75	100	6
	NCC—G3	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-
		Total			**31**				**500**	**26**
II	MIL-II	Tamil-II/Hindi-II /Malayalam-II/French-II/Arabic-II	3	6	-	-	25	75	100	4
	AECC-G1-II	English-II (Communicative English)	3	6	-	-	25	75	100	4
	DSC – IV	Statistics -II	3 3	4		4	25 40	75 60	100	6
	DSC – V	Analytical Geometry	3 3	4		4	25 40	75 60	100	6
	AECC – G2-I	Environmental Studies	3	1			100	-	100	1
	NCC-G3	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-
					30				**500**	**21**

Semester	Course Opted	Course Name	D	L	T	P	CIA	ES	Marks	Credits
III										
	DSC – VI	Trigonometry and Vector Calculus	3	4		4	25 40	75 60	100	6
	DSC – VII	Mechanics	3	4		4	25 40	75 60	100	6
	DSE-I	Elective-I	3 3	4		4	25 40	75 60	100	6
	SEC –G1– I	Commutative Skills - I	3	2			50		50	2
	NCC – G1-I	Career Skills - I	3	2			Grade			
	NCC-G3	NCC/NSS/ SPORTS/CULTURAL S	-	1	-	-	-	-	-	-
		Total			**29**				**350**	**20**
IV										
	DSC – VIII	Differential Equations and Laplace transforms	3 3	4		4	25 40	75 60	100	6
	DSC – IX	Modern Algebra	3	5	1		25	75	100	6
	DSE-II	Elective-II	3	5	1		25	75	100	6
	SEC –G1– II	Communicative Skills-II	3	2			50		50	2
	NCC – G1-II	Career Skills - II	3	2			Grade			
	AECC – G2-II	Aptitude	3	3			100	-	100	3
	NCC-G3	NCC/NSS/ SPORTS/CULTURAL S	-	1	-	-	-	-	-	-
	LIB	Library	-	1	-	-	-	-	-	-
					29				**450**	**23**

Semester	Course Opted	Course Name	D	L	T	P	CIA	ES	Marks	Credits
V	DSC – X	Real Analysis	3	5	1	-	25	75	100	6
	DSE-III	Elective-III	3 3	4		4	25 40	75 60	100	6
	DSE	EDC: Elective	3	5	1		25	75	100	6
	LIB	Library	-	2	-	-	-	-	-	-
	Any One Group									
	Group A									
	SEC-G2 –A-I	Placement - College to Corporate I	3	2			50	-	50	2
	SEC-G2-A-II	Placement - College to Corporate II		2			50	-	50	2
	Group B									
	SEC-G2 –B	Comprehensive Mathematics	3	4			100	-	100	4
	NCC-G3	NCC/NSS/ SPORTS/CULTURALS	-	-	-	-	-	Good/ Satisfactory	-	-
	Total				**26**				**400**	**22**
VI	DSC – XI	Complex Analysis	3	5	1		25	75	100	6
	DSC – XII	Elementary Number Theory	3	5	1		25	75	100	6
	DSE-IV	Elective-IV	3	5	1		25	75	100	6
	DSE – V	Elective-V Project & Viva Voce	3	6			40	60	100	6
	ALCTA	e-Learning in MOOC Platform	-	-	-	-	-	-	-	4*
					24				**400**	**24**
	Total								**2600**	**140**

*** Extra Optional Credit Course (ALCTA)**

ABBREVIATIONS

MIL	- Multi Indian/ International Languages
AECC-G1	- Ability Enhancement Compulsory Courses – I & II: Group - I (English)
AECC-G2	- Ability Enhancement Compulsory Courses – II & II: Group - II
DSC	- Discipline Specific Courses
DSE	- Discipline Specific Elective Courses
EDC	- Extra Disciplinary Course
NCC	- Non Credit Course
SEC	- Skill Enhancement Courses (Group-I & II)
ALCTA	- Advanced Learners Course in Thrust Areas– e Learning in MOOC platform

DSE I -Discipline Specific Elective Courses I: (III Semester)

1. Numerical Methods 2. Astronomy-I

DSE II- Discipline Specific Elective Courses II: (IV Semester)

1. Operations Research 2. Astronomy-II

DSE III-Discipline Specific Elective Courses III: (V Semester)

1. Linear Algebra 2. Latex

DSE IV- Discipline Specific Elective Courses IV: (VI Semester)

1. Discrete Mathematics 2. Mat Lab

DSE Discipline Specific Elective Courses : (V Semester)

Extra Disciplinary Course :(EDC) – Refer List

DSE-V-Discipline Specific Elective Courses V: (VI semester)

Project and Viva voce

After due discussion, the following resolutions were unanimously passed.

1. The candidate should earn a minimum of 136 credits for the completion of the UG program and the total marks will be 2600 for all UG programs, from 2017 - 18 batch onwards.
2. The candidate must secure a minimum of 30 marks out of 75 in Semester End Examinations theory examinations in each course (MIL -Multi Indian Language,

AECC-G1 -Ability Enhancement Compulsory Course-Group-1, DSC - Discipline Specific Course, DSE -Discipline Specific Elective, EDC-Extra Disciplinary Course). For the courses which have both theory as well as practical component, the minimum pass mark for theory and practical examinations will be 30 out of 75 and 24 out of 60 respectively. In the above mentioned courses theory marks will be 100 (25 CIA + 75 SEE) and practical marks will be 100 (40 CIA + 60 SEE). The sum of the above will be 200 which will be converted into 100. However, after conversion, the candidate should secure a minimum of 40% (with the minimum pass mark conditions mentioned above for each component) to get a pass in that particular course. If the candidate fails in any one of the above two components, he/she has to reappear for both theory and practical examinations. For AECC-G2 (Environmental Studies & Aptitude*****) and SEC (Skill Enhancement Course) - II (Group B) the minimum marks for a pass in each course is 40 out of 100. However for SEC –I (Communicative Skills) and SEC-II (Group A) the minimum pass will be 20 marks out of 50. Grade will be provided for Non-credit course Group-I (Career Skills I & II).

3. The theory and practical marks will be separately mentioned in the mark statement for the subjects comprising both theory as well as practical component.
4. For non-credit courses (Group-III) viz. NCC/NSS/Sports/Cultural activities the activity opted by the candidate will be mentioned in the fourth semester marks statement as “completed /not completed”. The aforesaid status will be based on the attendance/ progress report submitted by the concerned parent department.
5. It is compulsory for the candidates to secure the minimum Grade in Group I (Career Skills),a pass in Group II (COP- Career Oriented program) and the candidates should complete the non-credit course in Group III to become eligible for the award of the degree.

SEMESTER-I

Course Title : **STATISTICS – I (T)**	Course Code : **13A**
Semester : **I**	Course Group : **DSC-I**
Teaching Scheme in Hrs (L:T:P) : **5:1:0**	Credits : **6**
Map Code : **F(PROBLEM – ANALYSIS)**	Total Contact Hours : **90**
CIA : **25 Marks**	SEE # : **75 Marks**
Programme: **B.Sc MATHEMATICS**	# - **Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	CL
CO1	Remember random, discrete and continuous Variables	**PSO2**	18	R
CO2	Gain more knowledge in binomial, poisson and Normal distribution.	**PSO2**	18	U
CO3	Interpret marginal and conditional probability distribution.	**PSO2**	9	U
CO4	Update independence of random variables.	**PSO2**	9	AN
CO5	Estimate test of hypothesis like t, F, chi square test.	**PSO2**	18	U
CO6	Analyze correlation, rank correlation and regression.	**PSO2**	18	AP

UNIT I **LECTURE HOUR:18**

Random variables and Mathematical expectation

Distribution function (Introduction and Definitions)- Discrete random variables (Definitions, Theorems and Problems) - Probability mass function (Definition and illustration)- Continuous random variable- Probability density function (Theorems)- Addition theorem of expectation (Theorems and problems)- Multiplication theorem of expectation (Theorems and related problems).

UNIT II **LECTURE HOUR:18**

Moment generating function

Properties of moment generating function (Properties and Examples) - uniqueness theorem of moment generating function (Theorems and problems) - characteristic function (Necessary and Sufficient condition for a Function) - properties of characteristic functions (Properties and Examples) - Joint probability distributions (Theorems) - marginal and conditional probability distributions (Theorems and problems)- Independence of random variables (Theorems and problems)- Tchebychev's inequality (Theorem).

UNIT III **LECTURE HOUR:18**

Probability distributions

Binomial distribution (Introduction and Definitions) - Moments of binomial distribution (Theorems)- Recurrence relations for the moments (Theorems and problems)- Mean deviation, mode of binomial distribution (Theorems and problems)- Moment generating function of binomial distribution (Properties and Examples) - Poisson distribution (Introduction and Definitions)- Moments of the Poisson distribution (Theorems)- Mode of the Poisson distribution (Properties and Examples) - Normal distribution (Introduction and Definitions)- Chief characteristics of the normal distribution (Theorems and problems)- Mode of normal distribution (Properties and Examples) - Median of normal distribution and M.G.F of normal distribution (Properties and Examples).

UNIT IV **LECTURE HOUR:18**

Chi-square, t and F Test

Introduction- Chi-square ,t and F variates (Definitions)- Chi-square ,t and F Distribution (Derivatives) - Chi-square ,t and F M.g.f- Chi-square ,t and F Characteristic functions (Theorems and Dereivatives).

UNIT V **LECTURE HOUR:18**

Correlation and Regression

Definition (Examples) - Types of correlation (Formulas and Examples) - Karl Pearson's coefficient of correlation (Related problems) - Spearman's rank method (Related problems)- Regression (Related problems)- Difference between correlation and regression (Related problems) - Construct of regression equations in regression coefficients (Related problems).

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TEXT BOOKS:

T1. Business Mathematics and Statistics | Edition: | Margam publications,chennai | r.P.R.Vittal (2000).

T2. Fundamentals mathematical Statistics | Edition: | Sultan chand and sons | Guptha, S.C & Kapoor V.K (2002).

REFERENCE BOOK:

R1. Introduction to statistics Method | Edition: | S CHAND | Guptha C.B & Vijay Guptha(1988).

Course Title : **CLASSICAL ALGEBRA (T)**	Course Code : **13B**
Semester : **I**	Course Group : **DSC-II**
Teaching Scheme in Hrs (L:T:P) : **5:1:0**	Credits : **6**
Map Code : **F(PROBLEM – ANALYSIS)**	Total Contact Hours : **90**
CIA : **25 Marks**	SEE # : **75 Marks**
Programme: **B.Sc MATHEMATICS**	# - **Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl. Ses	CL
CO1	Remember about the binomial expansion.	PSO4	**18**	R
CO2	Analyze the sequence and series.	PSO4	**18**	AN
CO3	Point out varies types of test and to find the series.	PSO4	**18**	AN
CO4	Gain the theory of equations and various types of examples in roots of equations.	PSO4	**18**	U
CO5	Remember the logarithmic series.	PSO4	**8**	R
CO6	Solve about the exponential series to infinite and approximate values.	PSO4	**10**	AP

UNIT I **LECTURE HOUR:18**

Binomial and Exponential series

Binomial (Examples) - Binomial theorem for a rational index their statements and proof (Theorem)- Application of the binomial theorem to the summation of series and approximate values(Examples)- Exponential series-their statements and proof (Theorem) - Their immediate application to summation of series(Examples).

UNIT II **LECTURE HOUR:18**

Logarithmic Convergency and divergency of series

Logarithmic-their statement and proof (Theorem) - Their immediate application to summation of series only(Examples) - Limit of sequence (Definition and examples) - bounded sequence-monotonic sequence infinite series (Definition and examples) - Comparison test (Examples) - Cauchy's condensation test (Examples).

UNIT III **LECTURE HOUR:18**

Convergency and divergency of series

D'Alemberts ratio test (Examples) - Cauchy's root test (Examples) - Raabe's test (Examples) - Absolutely convergent series (Definition, Examples and Theorem).

UNIT IV **LECTURE HOUR:18**

Theory of equations

Roots of equations (Examples) - equation with real coefficient, imaginary roots occur in pairs (Examples) - Equation with rational coefficient irrational roots occur in pairs (Examples) - Relation between the roots and coefficient of equations (Examples) - Symmetric function of roots (Examples) - Transformation of equation (Examples) - Reciprocal roots (Examples) - Removal terms (Examples) - To increase or decrease the roots of a given equation by a given quantity-form a quotient and remainder when a polynomial is divided by a polynomial (Examples).

UNIT V **LECTURE HOUR:18**

Theory of equations

Descarte's rule of sign's (Examples) - Multiple roots (Examples) - Rolle's theorem (Examples) - Newton's methods of divisors (Examples) - Horner's method (Examples).

TEXT BOOK:

T1. Algebra | Edition: | S. Viswanathan Printers and Publishers Private Lt | T.K. Manicavachagom Pillai, T. Natarajan, K-S Gana (2008).

REFERENCE BOOK:

R1. Mathematics for B.Sc Branch I | Edition: | S.Chand and Company Ltd, New Delhi | P.Kandasamy and K.Thilagavathy (2004).

Course Title	: **CALCULUS (T)**	Course Code	: **13C**
Semester	: **I**	Course Group	: **DSC-III**
Teaching Scheme in Hrs (L:T:P) : **5:1:0**		Credits	: **6**
Map Code : **F (PROBLEM – ANALYSIS)**		Total Contact Hours	: **90**
CIA : **25 Marks**		SEE #	: **75 Marks**
Programme: **B.Sc MATHEMATICS**		**# - Semester End Exam**	

No.	**Course Outcome (Cos): After completion of this course, the students will be able to**	**PSOs**	**Cl. Ses**	**CL**
CO1	Estimate the Envelope graph, compute limits of, differentiate and integrate transcendental functions.	PSO3	18	U
CO2	Gain various techniques of integration and apply them to definite and improper integrals.	PSO3	18	R
CO3	Analysis the derivative concepts to find tangent lines to level curves and to solve optimization problems.	PSO3	10	AN
CO4	Solve the special functions like Beta and Gamma to evaluate multiple integrals.	PSO3	8	AP
CO5	To gain the knowledge about the Jacobian and Double and Triple Integrals	PSO3	18	AP
CO6	Solve the special functions like Reduction Formulae and Bernoulli's Formulae	PSO3	18	R

UNIT I **LECTURE HOUR:18**

Envelopes

Introduction (Definitions) - Method of finding the envelope (Derivations and problems).

Curvature

Circle, radius and centre of curvature (Book works and problems) - Cartesian formula for the radius of curvature (Formulas and problems) -The coordinates of the centre of curvature (Derivations and problems) - Evaluate and involute (Introduction) - Radius of curvature when the curve is given in polar coordinates (Book works and problems) - P-r equation, pedal equation of a curve (Book works and problems).

Partial Differentiation

Successive partial derivatives (Derivations and problems) - Total differential coefficient and Implicit functions (Formulas and problems) - Homogeneous functions and Euler's theorem (Theorems and problems).

UNIT II **LECTURE HOUR:18**

Integration

Methods of integration (Formulas and problems) - Integration of rational algebraic functions (Formulas and problems) - Special cases (Formulas and problems) - Integration of irrational functions and integration of 1 divided by a+b cosx (Formulas and problems) - Properties of definite integrals (Properties) - Integration by parts (Formulas and problems).

UNIT III **LECTURE HOUR:18**

Reduction formulae

Type integration of e power ax cosbx dx (Derivations and problems) - Bernoulli's formula (Problems).

Multiple integrals

Definitions of the double integral (Definitions) - Evaluation of the double integral (Related problems) - Double integral in polar coordinates (Related problems) - Triple integrals (Related problems) - Applications of multiple integrals (Application and problems) - Volumes of solids as double integrals (Related problems) - Volume as a triple integral (Related problems) - Areas of curved surfaces (Related problems).

UNIT IV **LECTURE HOUR:18**

Change of variables

Jacobian (Related problems) - Change of variable in the case of double integrals (Related problems) - Change of variable in the case of triple integrals (Related problems) - Transformation form Cartesian to polar coordinates (Derivations and problems)- Transformation form Cartesian to spherical polar coordinates (Derivations and problems).

Improper integrals

Infinite integral (Related problems) - Integral to plus infinity (Related problems) - Integral to minus infinity (Related problems) - Integral to plus infinity to minus infinity (Related problems).

UNIT V **LECTURE HOUR:18**

Beta and Gamma functions

Introduction (Basic Definitions) – Convergence (Derivations) - Recurrence formula of Gamma functions (Derivations and problems) - Properties of Beta functions (Properties) - Relation between Beta and Gamma functions (Derivations and problems) - Application of Gamma functions to multiple integrals (Derivations).

TEXT BOOKS:

T1. Calculus Volume I | Edition: | Vijay Nicole Imprints Private Limited | S.Narayanan & T. K. Manicavachagom pillai (2004).
T2. Calculus Volume ii | Edition: | S.Viswanathan Printers & Publishers | S.Narayanan & T.K.Manicavachagom pillai (1982).

REFERENCE BOOK:

R1. Mathematics for B.Sc Vol I & II | Edition: | S.Chand & Co | P. Kandasamy & K. Thilagavathy (2004).

SEMESTER-II

Course Title : **STATISTICS - II (T)**	Course Code : **23A**
Semester : **II**	Course Group : **DSC-IV**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **4**
Map Code: **F(PROBLEM – ANALYSIS)**	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # :**75 Marks**
Programme: **B.Sc-MATHEMATICS**	**# -- Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	CL
CO1	Remember population, sample, statistics and parameter.	PSO1& PSO2	10	R
CO2	Gain more knowledge of sampling and non-sampling errors.	PSO1& PSO2	7	R
CO3	Update the independent of random variables like t, F, Chi square test.	PSO1& PSO2	7	AN
CO4	Analyze the methods of estimation	PSO1& PSO2	12	AN
CO5	Analyze the test of significance for large samples	PSO1& PSO2	12	AN
CO6	Solve the ANOVA classification.	PSO1& PSO2	12	AP

UNIT I **LECTURE HOUR: 10**

Sampling from finite population

Definition (Basic concepts) - Population, sample, random sampling, stratified sampling, systematic sampling systematic sampling (Derivatives and Related Problems) - Estimation of mean, total and their standard errors (Derivatives and Related Problems) - Sampling and non-sampling errors (Derivatives and Related Problems).

UNIT II **LECTURE HOUR: 14**

Concept of population

Sample, statistics, parameter (Derivatives and Related Problems) - Concept of point estimation (Derivatives and Related Problems) - Unbiased ness- Efficiency (Derivatives and Related Problems) – Sufficiency (Derivatives and Related Problems) - Neyman factorization theorem (Derivatives and Related Problems) - Crammer Rao inequality (Derivatives and Related Problems) - Rao-Blackwell theorem (Derivatives and Related Problems).

UNIT III **LECTURE HOUR: 12**

Methods of estimation

Maximum likelihood moments (Derivatives and Related Problems) - Confidence interval (Derivatives and Related Problems) - Derivation of confidence interval (Derivatives and Related Problems) - Based on t,chi-square (Related problems)- F Statistic (Related problems).

UNIT IV **LECTURE HOUR: 12**

Testing of hypothesis

Types (Statement) - Sampling distribution (Statement) - Standard error (Statement and Results) - Neyman Person Lemma (Statement).

Test of significance

Large sample tests mean, proportion, difference between means, standard deviations and proportions (Statement and Results) - Exact tests based on t (Derivation) - Chi-square distribution (Derivatives and Related Problems) - Fisher's t distribution (Derivatives and Related Problems).

UNIT V **LECTURE HOUR: 12**

Experimental Design

Terminology in experimental Designs (Statement and Related Problems).

Analysis of variance

One way, two classifications (Statement and Related Problems) - Randomized Block Design (RBD) (Statement and Related Problems)- Completely randomized experimental design(CRD) (Related problems)- LSD (Related problems).

TEXT BOOKS:

T1. Fundamentals of Mathematical statistics by Guptha. S.C & Kapoor. V.K. Sulthan Chand & sons, 2009.

T2. Statistical methods by S.P.Gupta, Sulthan Chand & sons, 2008.

REFERENCE BOOK:

R1. Introduction to Statistics Method by Guptha C.B & Vijay Guptha (1988).

Course Title : **STATISTICS – II (P)**	Course Code : **23P**
Semester : **II**	Course Group : **DSC-IV**
Teaching Scheme in Hrs (L:T:P) : **0:0:4**	Credits : **2**
Map Code: **G (PRACTICAL PROGRAMMING)**	Total Contact Hours: **60**
CIA: **40 Marks**	SEE # :**60 Marks**
Programme: **B.Sc-MATHEMATICS**	**# - Semester End Exam**

LIST OF EXPERIMENTS:

UNIT-I

1. Graph- Simple, Multiple, Sub-divided graph
2. Diagrams- Line & Pie Diagrams
3. Calculation of Mean, Median, Mode
4. Construction of Correlation & Regression
5. Chi square test for independent data's
6. Paired ‘t’ test for two means
7. F-Test for two Variances
8. Calculation of Standard deviation
9. Calculation of One way Anova Classification
10. Calculation of Two way Anova Classification

TEXT BOOKS:

T1. SPSS, Dr. H. Premraj, Margham Publications, 2018.

T2. SPSS for you, A. Rajathi and P. Chandran, MJP Publishers, 2010.

T3. R-Programming, Dr. G. Sudhamathy and Dr. C. Jothi Venkateswaran, MJP Publishers, 2018.

Course Title : **ANALYTICAL GEOMETRY (T)**	Course Code : **23B**
Semester : **II**	Course Group : **DSC-V**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **4**
Map Code: **F(PROBLEM – ANALYSIS)**	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # :**75 Marks**
Programme: **B.Sc-MATHEMATICS**	**# -- Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl. Ses	CL
CO1	To gain the knowledge about concepts of Analytical Geometry of Two Dimensions and Three Dimensions.	PSO3	6	R & AN
CO2	Analysis the different between Cartesian and Polar coordinates to solve the relative problems.	PSO3	6	AN
CO3	Analysis various concepts about the straight lines and sphere.	PSO3	12	AN
CO4	Solve the equations like equations of enveloping cone and equations of quadric cone.	PS03	12	AN
CO5	Gain the Knowledge about basic concepts of right circular cone and right circular cylinder.	PS03	12	AN
CO6	Estimate the area and volume of various types of cone and cylinder.	PS03	6	U
CO7	Solve the equations like equations of right circular cone and equations of right circular cylinder.	PS03	6	AP

UNIT I **LECTURE HOUR: 12**

Analytical geometry of two dimensions - Polar Equations

Polar co-ordinates (Definition) - Distance between two points (Related Problems) - Transformation of polar coordinates into Cartesian coordinates (Book work) - Equation of a straight line (Related Problems) - Circle (Related Problems) - Polar equations of a conic directrix (Related Problems).

UNIT II **LECTURE HOUR: 12**

Analytical geometry of three dimensions – Equations of a straight line

Introduction (Book work) - Symmetrical form (Book work) - Angle between a plane & a line (Book work) - Projection of a line (Definition) - Perpendicular drawn to a line (Related problems) - Shortest distance between two skew lines (Related problems).

UNIT III **LECTURE HOUR: 12**

Sphere

Introduction (Book work) - Standard equations of a sphere (Book work) - Results based on the properties of a sphere (Related problems) - Redical plane (Related problems) - Equations $S+\lambda P=0$ & $S+\lambda S'=0$ (Related problems).

UNIT IV **LECTURE HOUR: 12**

Cone

Introduction (Book work) - Right circular cone (Related problems)- Equation of a cone (Related problems)- General Quadric cone (Related problems)- Enveloping cone (Related problems).

UNIT V **LECTURE HOUR: 12**

Cylinder

Introduction (Definition)- Equation of a cylinder (Related Problems & Book work)- Right circular cylinder (Related Problems & Book work).

TEXT BOOKS:

T_1. P.DuraiPandian, "Analytical Geometry 3D",1st Edition, Emerald Publishers,1986.

T_2. T.K.M.Pillai and T. Natarajan, "Analytical Geometry of 2D", 14th Edition, S.Viswanathan publishers, 2007

REFERENCE BOOKS:

R_1. P.DuraiPandian, Laxmi DuraiPandian, D.Muhilan "Analytical Geometry of 2D",1st Edition, Emerald Publications, 1985.

R_2. T.K.M.Pillai and T. Natarajan, "Analytical Geometry 3D", 12th Edition, S. Viswanathan Publications, 2008.

Course Title : **ANALYTICAL GEOMETRY (P)**		Course Code	: **23Q**
Semester : **II**		Course Group	: **DSC –V**
Teaching Scheme in Hrs (L:T:P) : **0:0:4**		Credits	: **2**
Map Code: **G (PRACTICAL PROGRAMMING)**		Total Contact Hours: **60**	
CIA: **40 Marks**		SEE #	:**60 Marks**
Programme: **B.Sc-MATHEMATICS**		**# - Semester End Exam**	

LIST OF EXPERIMENTS:
UNIT-I

1. Obtain the equation of Tangent and Normal and draw the curve.
2. Trace the conics.
3. Obtain the straight lines equation and trace the curve.
4. Obtain the angle between the lines and trace the curve.
5. Obtain the equation of sphere and trace the curve.
6. Obtain the equation of tangent plane and trace the curve.
7. Obtain the equation of cone and trace the curve.
8. Obtain the equation of right circular cone and trace the curve.
9. Obtain the equation of cylinder and trace the curve.
10. Obtain the equation of right circular cylinder and trace the curve.

TEXT BOOKS:

T1. Programming in Basic, E. Balagurusamy, Tata Mc Grow Hill Publishing Company Ltd, 3rd Edition, 1992.
T2. C Programming Language, Brian W. Kernighan, Dennis. M. Ritchie, Prentice-Hall of India Private Ltd, 2nd Edition, 1999.

SEMESTER-III

Course Title : **Trigonometry and Vector Calculus (T)**	Course Code : **33A**
Semester : **III**	Course Group : **DSC – VI**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **4**
Map Code: **F(PROBLEM – ANALYSIS)**	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # :**75 Marks**
Programme: **B.Sc-MATHEMATICS**	**# -- Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl. Ses	CL
CO1	Recall the Trigonometry Expansions and Hyperbolic functions.	PSO1, PSO2	12	R
CO2	Interpret the values of Logarithms complex quantities	PSO1, PSO2	10	U
CO3	Outline the concept of method of difference and Euler's series.	PSO1, PSO2	14	U
CO4	Explain vector function, Derivative of a vector function, Scalar and vector point.	PSO1, PSO2	10	U
CO5	Evaluating the line integral, surface integral and surface integral.	PSO1, PSO2	7	AP
CO6	Make use of Gauss divergence theorem, Green's theorem, Stoke's theorem to solve the problem.	PSO1, PSO2	7	AP

UNIT I **LECTURE HOUR: 12**

Expansions and Hyperbolic functions

Expansions of $\cos n\theta$ and $\sin n\theta$ (Formulas and Related Problems)- Expansion of $sin^n\theta$,$cos^n\theta$ when n is a positive integer (Formulas and Related Problems)- Hyperbolic functions (Formulas and Related Problems)- Inverse hyperbolic functions (Related Problems)- Separate into real and imaginary parts (Related Problems).

UNIT II **LECTURE HOUR: 10**

Logarithms of complex quantities and Summation of trigonometrically series

Logarithms of $x + iy$ (Theorem and problems) - Method of differences (Related Problems)- Euler series (Related Problems).

UNIT III **LECTURE HOUR: 14**

Differentiation of vector functions and Gradient of a scalar point function and divergence and curl of a vector point function

Vector functions (Related Problems)- Derivative of a vector function (Related Problems)- Scalar and vector point functions (Related Problems)- Gradient of a scalar point function (Related

Problems)- Divergence and curl of a vector point function and Laplacian differential operator(Related Problems).

UNIT IV **LECTURE HOUR: 10**

Integration of point functions

Line integrals (Related Problems)- Surface integrals and Volume integrals (Related Problems).

UNIT V **LECTURE HOUR: 14**

Integral theorems

Introduction (Definition) - Gauss divergence theorem (Statement and Related Problems)- Green's theorem in plane (Statement and Related Problems)- Stoke's theorem (Statement and Related Problems).

TEXT BOOKS:

T_1. Narayanan and T K Manicavachagom Pillay, "Trigonometry", First Edition, S.Viswanathan Pvt.Ltd, 2007.

T_2. P.Duraipandian & Laxmi Duraipandian, "Vector calculus" First Edition,Emerald Publishers,2008.

REFERENCE BOOK:

R1. P.Kandasamy & K.Thilagavathy,"Mathematics", First edition Volume IV (Vector Calculus), S.Chand & Company Ltd., Ramnagar, NEW DELHI-110 055, 2004.

Course Title : **Trigonometry and Vector Calculus (P)**	Course Code : **33P**
Semester : **III**	Course Group: **DSE –VI**
Teaching Scheme in Hrs (L:T:P) : **0:0:4**	Credits: **2**
Map Code: **G (PRACTICAL PROGRAMMING)**	Total Contact Hours: **60**
CIA: **40 Marks**	SEE # :**60 Marks**
Programme: **B.Sc-MATHEMATICS**	**# - Semester End Exam**

LIST OF EXPERIMENTS:

UNIT-I

1. Calculating the value of sine, cosine, tan using C programming.
2. Calculating the value of sec, cosec, cot using C programming.
3. Calculating the value of inverse of sine, cosine, tan using C programming.
4. Calculating the value of inverse of sec, cosec, cot using C programming
5. Calculating the value of hyperbolic of sine, cosine using C programming.
6 .Calculating the value of hyperbolic tangent sec using C programming.
7. Calculating the value of hyperbolic cosec, cot using C programming.
8. Calculating the expansion value of using C programming.
9. Calculating the logarithmic value of using C programming.
10. Write to C program. To find the directional derivative of the function p=2x, q=2y,r=2z at (3,6,9) in the direction whose direction cosine are 1\3,2\3,2\3.
11. Prove that the function $p=2xz^2$, $q=xz^2$ $r=-3xz^2$ is solenoidal.
12. Write to C program. To find the directional derivative of the function $p=1+y^2$, $q=2xy+z^3$, $r= 3yz^2$ at (0,1,1) in the direction whose direction vector 2i+2j-k.

TEXT BOOKS:

T1. Programming in Basic, E. Balagurusamy, Tata Mc Grow Hill Publishing Company Ltd, 3rd Edition, 1992.

T2. Programming ANSI C, Stephin G. Kochan, HP-Hayden Books, 1st Edition, 1999.

T3. Treatment as in: MATLAB An Introduction with Applications By AmosGilat. JOHN WILEY & SONS, INC., 2011.

Course Title : **MECHANICS (T)**	Course Code : **33B**
Semester : **III**	Course Group: **DSC -VII**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **4**
Map Code: **F (PROBLEM – ANALYSIS)**	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # : **75 Marks**
Programme: **B.Sc-MATHEMATICS**	# - **Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	CL
CO1	Compute free-body diagrams and to calculate the reactions necessary to ensure static equilibrium.	PSO3	12	AN
CO2	Calculate centroids and moments of inertia.	PSO3	12	AN
CO3	Discuss the knowledge of momentum methods for rigid bodies.	PSO3	12	U
CO4	Examine Work / Energy to determine velocity or position of a particle in motion	PSO3	10	AN
CO5	Relate the range and path of the projectile	PSO3	7	AN
CO6	Discuss the simple harmonic motion	PSO3	7	U

UNIT I **LECTURE HOUR: 12**

Forces acting at a point

Parallelogram law of forces (Theorems, derivations and Related Problems) - Triangle of forces (Theorems) - The polygon of forces (Theorems, derivations and Related Problems)- An extended form of the parallelogram law of forces (Theorems, derivations and Related Problems)- Conditions of equilibrium (Related Problems).

Parallel Forces and Moments

The resultant of two like and unlike parallel forces acting on a rigid body (Theorems) - Moment of a force about a point (Theorems)- Varigon's theorem of moments (Theorems and Related Problems).

UNIT II **LECTURE HOUR: 12**

Equilibrium of three forces acting on a rigid body

Three coplanar forces (Theorems)- Two trigonometrical theorem (Theorems and Related Problems).

Coplanar Forces

Reduction of any number of coplanar forces (Theorems) - Conditions for a system of forces to reduce to a single force or to a couple (Theorems).

Friction

Laws of friction (Theorems)- Equilibrium of a particle on a rough inclined plane (Theorems and Related Problems)- Equilibrium of a body on a rough inclined plane under a force parallel to the

plane (Theorems and Related Problems)- Equilibrium of a body on a rough inclined plane under any force (Theorems and Related Problems).

UNIT III **LECTURE HOUR: 12**

Projectiles

Path of a projectile (Derivation and Related Problems)- Characteristics of the motion of a projectile (Definition and Related Problems)- Horizontal range (Derivation and Related problems)- Range on an inclined plane (Theorems and Derivations)- Motion on the surface of a smooth inclined plane (Related Problems).

UNIT IV **LECTURE HOUR: 10**

Central orbits

Differential equation of central orbits (Theorems) - Pedal equation of the central orbit (Derivation)- Velocities in a central orbit (Theorems and Related Problems) - Law of force to the pole (Derivation and Related problems).

UNIT V **LECTURE HOUR: 14**

Simple harmonic motion

Simple harmonic motion in a straight line (Derivation)- General solution of the simple harmonic motion equation (Derivation and Related problems)- Composition of two simple harmonic motion of the same period and in the same straight line (Derivation) - Composition of two simple harmonic motion of the same period in two perpendicular directions (Derivation and Related problems).

TEXT BOOKS:

T1. Dr.M.K.Venkataraman, “Statics”,Nineth Edition,Agasthiar Publications,1999.
T2. Dr.M.K.Venkataraman, “DYNAMICS”, 10th Edition , Agasthiar Publications,2001.

REFERENCE BOOKS:

R1. A.V.Dharmapadam, “Statics”,S.Viswanathan Printers and Publishing Pvt Ltd.
R2. A.V.Dharamapadam , “Dynamics”, S.Viswanathan Printers and Publishers Pvt., Ltd, Chennai, 1998.

Course Title : **MECHANICS (P)**	Course Code : **33Q**
Semester : **III**	Course Group: **DSC -VII**
Teaching Scheme in Hrs (L:T:P) : **0:0:4**	Credits: **2**
Map Code: G (PRACTICAL EXPERIMENTS)	Total Contact Hours: **60**
CIA: **40 Marks**	SEE # :**60 Marks**
Programme: **B.Sc-MATHEMATICS**	**# - Semester End Exam**

LIST OF EXPERIMENTS:

UNIT-I

Using **SCILAB** write a Programme to

1. Resultant force
2. Free body diagram
3. Moment of the force
4. Magnitude of the applied force and reaction force
5. Projectile
6. Moment
7. Magnitude and direction of a resultant force

TEXT BOOK:

T1. Ron Larsen and Steve Hunt, “Using MATLAB for Statics and Dynamics”.

Course Title : **NUMERICAL METHODS (T)**	Course Code : **33E**
Semester : **III**	Course Group: **DSE-I**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **4**
Map Code: **F(PROBLEM – ANALYSIS)**	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # :**75 Marks**
Programme: **B.Sc - MATHEMATICS**	# -- **Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	CL
CO1	Define the Numerical Algebraic and Transcendental Equations	PSO1 & PSO2	12	R
CO2	Demonstrate Simultaneous Equations	PSO1 & PSO2	12	U
CO3	Develop the Interpolation and Differentiation	PSO1 & PSO2	7	AP
CO4	Solve the Gauss Method of Iterations	PSO1 & PSO2	7	AP
CO5	Interpret the Numerical Differentiation and Integration	PSO1 & PSO2	10	AP
CO6	Solve the Numerical Differentiation and Integration	PSO1 & PSO2	12	AP

UNIT I **LECTURE HOUR: 12**

The Solution of Numerical Algebraic and Transcendental Equations

Bisection Method (Related Problems) - Iteration Method- Regula falsi Method (Related Problems) - Newton-Raphson Method (Related Problems) - Eigen values and Eigen vectors (Related Problems).

UNIT II **LECTURE HOUR: 12**

Solution of Simultaneous Linear Algebraic Equations

Gauss Elimination Method (Related Problems) - Gauss Jordan Method (Related Problems) - Gauss Jacobi Method (Related Problems) - Gauss Seidal Method of Iterations (Related Problems).

UNIT III **LECTURE HOUR: 14**

Finite Differences and Interpolation

Forward and Backward differences (Related Problems) - Newton's Forward interpolation Formula (Related Problems) - Newton's Backward interpolation Formula (Related Problems) - Lagrange's interpolation formula (Related Problems) - Runge- Kutta Method (Related Problems).

UNIT IV **LECTURE HOUR: 10**

Numerical Differentiation and Integration

Newton's Forward difference Formula (Related Problems) - Newton's Backward difference Formula (Related Problems).

UNIT V **LECTURE HOUR: 12**

Numerical Differentiation and Integration

Trapezoidal Rule (Related Problems) - Romberg's Method (Related Problems) - Simpson's One – third rule (Related Problems) - Simpson's three – eighth rule (Related Problems).

TEXT BOOK:

T1. Dr. P. Kandasamy , Dr. K.Thilagavathy , Dr. K. Gunavathi, "Numerical Methods", Third Edition S.Chand & Company Ltd, 2010.

REFERENCE BOOK:

R1. Dr. A. Singaravelu, "Numerical Methods", (New Revised Edition), Meenakshi Agency, 2010.

Course Title : **NUMERICAL METHODS (P)**	Course Code : **33R**
Semester : **III**	Course Group: **DSE –I**
Teaching Scheme in Hrs (L:T:P) : **0:0:4**	Credits: **2**
Map Code: **G (PRACTICAL PROGRAMMING)**	Total Contact Hours: **60**
CIA: **40 Marks**	SEE # :**60 Marks**
Programme: **B.Sc-MATHEMATICS**	# - **Semester End Exam**

LIST OF EXPERIMENTS:

UNIT-I

1. Obtaining the root of an equation by Bisection Method.
2. Obtaining the root of an equation by False-Position Method.
3. Obtaining the root of a transcendental equation by Newton- Raphson Method.
4. Solving set of simultaneous linear equations by Gauss elimination method.
5. Solving set of simultaneous linear equations by Jacobi Iteration method.
6. Solving ODE using second order Runge-Kutta Method.
7. Solving ODE using fourth order Runge-Kutta Method.
8. Single Integration by Trapezoidal rule.
9. Single Integration by Simpson's 1/3 rule.
10. Single Integration by Simpson's 3/8 rule.

TEXT BOOKS:

T1. Programming in Ansi C, E. Balagurusamy, Tata Mc. Graw Hill Publishing Company Limited, 2004.
T2. Numerical Methods with Programs in C, T.Veerarajan and T. Ramachandran, Tata Mc Graw-Hill Publishing Company Limited, 2012.

Course Title : **ASTRONOMY-I (T)**	Course Code : **33E**
Semester : **III**	Course Group: **DSE –I**
Teaching Scheme in Hrs (L:T:P) : **5:1:0**	Credits: **6**
Map Code: **F(PROBLEM – ANALYSIS)**	Total Contact Hours: **90**
CIA: **25 Marks**	SEE # :**75 Marks**
Programme: **BSc-MATHEMATICS**	**# - Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	CL
CO1	Compute Relevant properties of a sphere.	PSO3	9	AN
CO2	Calculate relevant formulae for spherical trigonometry.	PSO3	9	AN
CO3	Discuss Celestial sphere.	PSO3	18	U
CO4	Examine Geocentric Parallax	PSO3	18	AN
CO5	Relate Astronomical refraction	PSO3	18	AN
CO6	Discuss Relation between true eccentric and mean anomalies.	PSO3	18	U

UNIT I **LECTURE HOUR: 18**

Relevant properties of a sphere and relevant formulae for spherical trigonometry (Theorems and Properties).

UNIT II **LECTURE HOUR: 18**

Celestial sphere (Theorems and Problems) – Celestial co-ordinates (Related problems) -Diurnal motion (Theorems) -Variation in length of the day (Related problems).

UNIT III **LECTURE HOUR: 18**

Dip of the horizon (Theorems and Problems)–Twilight (Related problems) –Geocentric Parallax(Related problems).

UNIT IV **LECTURE HOUR: 18**

Astronomical refraction (Theorems and Problems) –Tangent and Cosine's Formula (Related problems).

UNIT V **LECTURE HOUR: 18**

Kepler's Laws (Theorems and Problems)–Relation between true eccentric and mean anomalies (Related problems).

TEXT BOOK:

T1. S. Kumaravelu and Prof. Susheela Kumaravelu, Astronomy, SKV Publications, 2004.

REFERENCE BOOK:

R1. V. Thiruvenkatacharya, A Text Book of Astronomy, S. Chand and Co., Pvt. 2005.

SEMESTER-IV

Course Title: **DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS (T)**	Course Code : **43A**
Semester : IV	Course Group :**DSC- VIII**
Teaching Scheme in Hrs (L:T:P) : 4:0:0	Credits : 4
Map Code: F **(PROBLEM – ANALYSIS)**	Total Contact Hours: **60**
CIA: 25 Marks	SEE # :**75 Marks**
Programme: **B.Sc MATHEMATICS**	**# -- Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	CL
CO1	Recall the differential equations and explain the types of Differential equations to solve them.	PSO1, PSO2	12	AP
CO2	Define the Linear Differential equations.	PSO1, PSO2	12	R
CO3	Classify the second and higher order equations.	PSO1, PSO2	6	AN
CO4	Define the Partial differential equations to solve the standard forms of linear Partial differential equations.	PSO1, PSO2	6	AP
CO5	Define Laplace transform and explain the standard functions to solve $tf(t), \frac{f(t)}{t}, f'(t), f''(t)$.	PSO1, PSO2	12	AP
CO6	Relate the Inverse Laplace Transforms to solve the first and second order differential equations with constant coefficients.	PSO1, PSO2	12	AP

UNIT I **LECTURE HOUR: 12**

Ordinary Differential equations

Equations of the first order and of degree higher than one – Solvable for p, x, y (Related Problems) - Clairaut's equations (Related Problems) - Simultaneous Differential equations with constant coefficients of the form $f_1(D)x + g_1(D)y = \varphi_1(t)$ and $f_2(D)x + g_2(D)y = \varphi_2(t)$. (Related Problems).

UNIT II **LECTURE HOUR: 12**

Linear Differential equations

Finding the solution of second and higher order with constant coefficients with right hand side is of the form $v\, e^{ax}$ where v is a function of x. (Related Problems)

UNIT III **LECTURE HOUR: 12**

Partial differential equations

Formation of differential equations by elimination of arbitrary constants and functions (Related Problems) - Methods to solve the first order partial differential equations in standard forms F(p,q) = 0, Clairaut's Form, F(z,p,q) = 0, F(x,p,q) = 0, F(y.p,q) = 0 (Related Problems) - Lagrange's method to solve the linear partial differential equations $P_p + Q_q = R$. (Related Problems)

UNIT IV **LECTURE HOUR: 12**

Laplace Transforms

Laplace transforms of standard functions (Theorems) - Linear Property (Theorems and problems) - Transforms of $tf(t), \frac{f(t)}{t}, f'(t), f''(t)$. (Related Problems).

UNIT V **LECTURE HOUR: 12**

Inverse Laplace Transforms

Problems using partial fractions (Related Problems) - Solutions of differential equations by applying Laplace transforms (Related Problems).

TEXT BOOK:

T1. Kandasamy.P ,Thilagavathi.K " Mathematics for B.Sc – Branch –I Volume III" , S.Chand and Company Ltd, New Delhi,1 edition, 2004.

REFERENCE BOOK:

R1. S.Narayanan and T.K. ManickavasagamPillai, "Calculus", S.Viswanathan (Printers and Publishers) Pvt. Ltd, Chennai 1991.

Course Title : **DIFFERENTIAL EQUATIONS AND LAPALCE TRANSFORMS (P)**	Course Code : **43P**
Semester : IV	Course Group :**DSC- VIII**
Teaching Scheme in Hrs (L:T:P) : 0:0:4	Credits : **2**
Map Code: **G (PRACTICAL PROGRAMMING)**	Total Contact Hours: **60**
CIA: **40 Marks**	SEE # :**60 Marks**
Programme: **B.Sc MATHEMATICS**	# - Semester End Exam

LIST OF EXPERIMENTS:

UNIT-I

1 To obtain a solution for First Order Differential Equations using MATLAB.
2. To obtain a solution for Second Order Differential Equations using MATLAB.
3. To obtain a solution for Partial Differential Equations using MATLAB.
4. To obtain a solution for Laplace Transforms using MATLAB.
5. To obtain a solution for Inverse Laplace Transforms using MATLAB.

TEXT BOOK:

T1. Calculus Differential Equations with Matlab, Pramote Dechaumphai, Chulalongkorn University Press, 2016.

Course Title : **MODERN ALGEBRA (T)**	Course Code : **43B**
Semester : IV	Course Group :**DSC- IX**
Teaching Scheme in Hrs (L:T:P) : 5:1:0	Credits : 6
Map Code: F **(PROBLEM – ANALYSIS)**	Total Contact Hours: **90**
CIA: 25 Marks	SEE # :**75 Marks**
Programme: **B.Sc MATHEMATICS**	**# -- Semester End Exam**

No	Course Outcome (Cos):On the successful completion of this course, the students will be able to	PSOs	Cl.Ses	CL
CO1	Define the basic concepts of set theory, group theory and explain their related properties.	PSO4	18	R
CO2	Recall the types of subgroups and demonstrate the related theorems.	PSO4	18	R
CO3	Define the homomorphism, Isomorphism and also develop the proof of Cauchy's theorem and Cayley's theorem for abliean and permutation groups.	PSO4	18	R
CO4	Relate the properties of Ring theory and solve the related theorems.	PSO4	18	U
CO5	List out the properties of fields and illustrate the theorems of integral domain.	PSO4	9	R
CO6	Define ideals and outline the quotient rings and develop the theorem on imbedded in a ring.	PSO4	9	R

UNIT I **LECTURE HOUR: 18**

Set Theory & Group Theory

Mapping (Examples) - The Integers (Theorem) - Definition and examples, basic properties (Examples) - Definition of a group, some examples of groups (Theorem) - Some preliminary lemmas (Theorem).

UNIT II **LECTURE HOUR: 18**

Sub Groups

Cyclic group (Theorem) - Index of a group (Examples) - Lagrange's theorem-Euler theorem (Theorem)- Fermat theorem (Theorem)- A counting principle (Definition) - Normal subgroups and quotient groups (Definition and Theorems).

UNIT III **LECTURE HOUR: 18**

Homomorphism

Isomorphism (Examples) - Cauchy's theorem for Abelian group (Theorem) - Automorphism (Definition and Theorems) - Inner Automorphism (Definition and Theorems)- Cayley's theorem permutation groups (Definition and Theorems).

UNIT IV **LECTURE HOUR: 18**

Ring Theory

Definition and examples (Definition and Examples) - Some special classes of rings (Examples) - The Pigeon hole principle (Definition and Examples) -Field- Integral domain (Definition and Examples) - Finite characteristic (Definition and Theorems). - Homomorphism of Rings (Definition and Theorems).

UNIT V **LECTURE HOUR: 18**

Ideals and Quotient Rings

More Ideals and Quotients Rings (Definition and Theorems)- Maximal Ideal (Definition)- The field of quotient of an integral domain(Definition and Theorems) -Imbedded in a ring R (Definition and Theorems)- Field of Quotients (Definition and Theorems).

TEXT BOOK:

T1.Topics in Algebra, I.N. Herstein, John Wiley & Sons, New Yark, 2008.

REFERENCE BOOKS:

R1. Sujeet Singh and Qazi Zameeruddin, Modern Algebra, Vikas Publishing house, 1992.
R2. A.R. Vasishtha, Modern Algebra, Krishna Prakashan Mandir, Meerut, 1994-95.

Course Title : **OPERATIONS RESEARCH (T)**	Course Code : **43E**
Semester : **IV**	Course Group : **DSE –II**
Teaching Scheme in Hrs (L:T:P) : **5:1:0**	Credits : **6**
Map Code**: F (PROBLEM – ANALYSIS)**	Total Contact Hours: **90**
CIA: **25 Marks**	SEE # : **75 Marks**
Programme: **B.Sc-MATHEMATICS**	**# - Semester End Exam**

No	**Course Outcome (Cos): After completion of this course, the students will be able to**	**PSOs**	**Cl.Ses**	**CL**
CO1	Explain the formulation of Linear Programming Problem and types of Linear Programming Problem	PSO3	18	AP
CO2	Construct transportation and assignment Problem.	PSO3	18	AP
CO3	Develop 2 x n and m x 2 graphical problems.	PSO3	18	AP
CO4	Derive the method of Queuing System.	PSO3	9	AP
CO5	Determine the method of Types of Inventories.	PSO3	9	AP
CO6	Build the method of Time calculation in Networks.	PSO3	18	AP

UNIT I **LECTURE HOUR: 18**

Linear Programming Problem

Formulation of L.P.P (Related problems)- Graphical solutions of L.P.P(Related problems)- Simplex Method (Related problems)- Method of Penalties (or) Big M Method (Related problems)- Two Phase Simplex method (Related problems)- Duality in L.P.P (Related problems).

UNIT II **LECTURE HOUR: 18**

The transportation Problems

Basic feasible solution by NWC (Related problems)- Basic feasible solution by LCM (Related problems)- Basic feasible solution by VAM (Related problems)- Optimum solutions (Related problems)- Unbalanced Transportation problems (Related problems).

The Assignment Problems

Assignment algorithm (Related problems)- Optimum solutions (Related problems)- Unbalanced Assignment Problems (Related problems).

UNIT III **LECTURE HOUR: 18**

Game Theory

Two person zero sum game (Related problems)- The Maxmini – Minimax principle problem (Related problems)- Solution of 2 x2 rectangular Games (Related problems)- Domination Property-(2 x n) and (m x 2) graphical method (Related problems).

UNIT IV **LECTURE HOUR: 18**

Queuing Theory

Queuing system and Characteristics of Queuing system (Related problems)- Problems in (M/M/1): (∞/FIFO) (Related problems)- Problems in M/M/1) : (N/FIFO) (Related problems)- Problems in (M/M/C) : (∞/FIFO) (Related problems)- Problems in (M/M/C) : (N/FIFO) (Related problems).

Inventory control

Types of inventories (Related problems)- EOQ Problem with no shortages (Related problems)- Production problem with no shortages-(Related problems)-EOQ with shortages (Related problems)- Production problem with shortages (Related problems) - EOQ with price breaks (Related problems).

UNIT V **LECTURE HOUR: 18**

Network scheduling by PERT / CPM

Network and basic Components (Related problems)- Rules of Network construction (Related problems) - Time calculation in Networks (Related problems)- Critical Path Method (Related problems)- PERT calculations (Related problems)- Cost Analysis (Related problems)- Crashing the Network (Related problems).

TEXT BOOKS:

T1. Operations Research – Kandiswarup, P. K. Gupta, Man Mohan, S. Chand & Sons Education Publications, New Delhi, 12th Revised edition.

T2. Resource Management Techniques – V.Sundaresan, K.S.Ganapathy Subramanian, K.Ganesan, A. R. Publications.

REFERENCE BOOKS:

R1. Operations Research – Prem Kumar Gupta D. S. Hira, S. Chand & Company Ltd, Ram Nagar, New Delhi.

R2. Operations Research Principles and Problems: S. Dharani Venkata Krishnan, Keerthi Publishing house PVT Ltd.

Course Title : **ASTRONOMY-II (T)**	Course Code : **43E**
Semester : **IV**	Course Group: **DSE –II**
Teaching Scheme in Hrs (L:T:P) : **5:1:0**	Credits: **6**
Map Code: **F (PROBLEM – ANALYSIS)**	Total Contact Hours: **90**
CIA: **25 Marks**	SEE # : **75 Marks**
Programme: **B.Sc-MATHEMATICS**	# - **Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	CL
CO1	Compute sphere and relevant formulae for spherical trigonometry	PSO3	9	AN
CO2	Calculate sphere and relevant formulae for spherical trigonometry.	PSO3	9	AN
CO3	Discuss Kepler's Laws of Planetary motion.	PSO3	18	U
CO4	Examine Three anomalies of the Earth and relation between them.	PSO3	18	AN
CO5	Relate Geocentric Parallax and Annual Parallax.	PSO3	18	AN
CO6	Discuss Moon and Motions of planet.	PSO3	18	U

UNIT I **LECTURE HOUR: 18**

Relevant properties of a sphere and relevant formulae for spherical trigonometry (All without Proof) –Celestial sphere (Theorems and Problems) – Diurnal motion (Related problems).

UNIT II **LECTURE HOUR: 18**

Earth (Definition) – Dip of the horizon ((Theorems and Problems) –Twilight (Definition) – Astronomical refraction (Theorems and Problems)–Tangent and Cosine's Formula (Theorems and Problems)– Properties and simple problems applying them (Theorems and Problems).

UNIT III **LECTURE HOUR: 18**

Kepler's Laws of Planetary motion (statement only) –Newton's deductions from them –Three anomalies of the Earth and relation between them (Theorems and Problems) – Time Equation of time –Seasons (Theorems and Problems).

UNIT IV **LECTURE HOUR: 18**

Years and Calendar (Related problems) – Geocentric Parallax (Related problems) –Annual Parallax (Related problems) –Aberration of light (Theorems and Problems) - simple problems in the above.

UNIT V **LECTURE HOUR: 18**

Moon (Except Moon's liberations)-Motions of planet (Assuming that orbits are circular) - Eclipses.

TEXT BOOK:

T1. S.Kumaravelu and Prof. Susheela Kumaravelu, Astronomy, SKV Publications, 2004.

UNIT I - Chapters 1 and 2

UNIT II - Chapter 3 Section 1, 2, 5, 6 and Chapter 4 Sections 117 to 120, 129, 130

UNIT III- Chapter 6

UNIT IV -Chapter 7 Section 1, 3, 4 and Chapter 8 Sections 190 to 193

UNIT V - Chapter 12

REFERENCE BOOK:

R1. V. Thiruvenkatacharya, A Text Book of Astronomy, S. Chand and Co., Pvt Ltd, 1972.

SEMESTER-V

Course Title : **REAL ANALYSIS (T)**	Course Code : **53A**
Semester : **V**	Course Group : **DSC-X**
Teaching Scheme in Hrs (L:T:P) : **5:1:0**	Credits : **6**
Map Code: **F(PROBLEM – ANALYSIS)**	Total Contact Hours: **90**
CIA: **25 Marks**	SEE # :**75 Marks**
Programme: **B.Sc-MATHEMATICS**	# -- **Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl. Ses	CL
CO1	Recall About the countable sets and set algebra	PSO4	10	R
CO2	Analyze the elements of point set topology in Euclidean space R^n	PSO4	10	AN
CO3	Analyze the elements of point set topology in Metric space	PSO4	16	AN
CO4	Recall the limits, continuity function and convergent sequence	PSO4	18	R
CO5	Analyze Uniform continuity in Euclidean and metric space	PSO4	18	AN
CO6	Recall the Derivatives and Integration Properties in various types of functions.	PSO4	18	RE

Unit-I **Lecture hours 20**

Countable and Uncountable sets

Countable and Uncountable Sets (Definitions, Theorems and Examples) -Countable collection of countable sets (Theorem) - Set algebra (Theorem) - Uncountability of the real number system (Theorem).

Elements of point set topology

Euclidean space in R^n-Open balls and open sets in R^n (Definitions and Theorem) -Closed sets-Adherent points (Definitions and Theorem), Accumulation points (Definitions and Theorem) -Closed sets, Adherent points (Definitions and Theorem) -Bolzano's Weierstrass theorem (Theorem) -Cantor intersection theorem (Theorem).

Unit-II **Lecture hours 16**

Elements of point set topology

Covering (Definition and Example) -Lindel of covering theorem (Theorem) -Heine-Borel covering theorem (Theorem) -Compactness in R^n (Theorem) -Metric spaces (Definition and Example) -Point set topology in metric spaces (Definitions and Theorem) -Compact subsets of metric spaces (Definitions and Theorem)-Boundary of a set (Definition).

Unit-III **Lecture hours 18**

Limits and Continuity

Limits and Continuity (Definition and Example)-Convergent sequences in a metric space (Theorem) -Cauchy sequences (Theorem and Example)-Complete metric spaces (Theorem) - Limit of a function (Definition) -Continuous functions-Examples of continuous functions (Definition and Example)-Continuity and inverse images of open or closed sets (Definitions and Theorem)-functions continuity on compact sets (Definitions and Theorem).

Unit-IV **Lecture hours 18**

Connectedness and Uniform Continuity

Connectedness (Definitions, Theorems and Examples) -Components of metric space (Theorem) -Uniform continuity (Theorem and Examples) -Uniform continuity and compact sets (Definitions, Theorems and Examples) - fixed point theorem for contractions (Definitions and Theorem)-Discontinuity of real-valued functions (Definitions, Theorems and Examples) - Monotonic functions (Definitions, Theorems and Examples).

Unit-V **Lecture hours 18**

Derivatives and Riemann Integration

Derivatives and Continuity (Definition and Examples)-Algebra of derivatives (Theorem) - Chain rule (Theorem) -Mean-Value theorems for derivatives (Theorem) - Properties of monotonic functions (Theorem) - functions of bounded variation (Theorem and Examples) . Linear Properties (Theorem) -Integration by parts (Derivation)-Change of variables in Riemann Stieltjes Integral ((Theorem) -Reduction to a Riemann integral (Theorem).

TEXT BOOK:

T1. APOSTAL, Mathematical Analysis, Narasa Publishing House, Second Edition (1973).

REFERENCE BOOK:

R1. R.R. Goldberg, Methods of Real Analysis, NY. John Wiley, New York, (1976).

Course Title : **LINEAR ALGEBRA (T)**	Course Code : **53B**
Semester : **V**	Course Group : **DSE – III**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **4**
Map Code: **F (PROBLEM – ANALYSIS)**	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # :**75 Marks**
Programme: **B.Sc MATHEMATICS**	**# -- Semester End Exam**

No	Course Outcome Cos) : After completion of this course, the students will be able	PSOs	Cl.Ses	CL
CO1	Define the basic concepts of vector spaces, and subspaces explain their related properties.	PSO1 & PSO2	12	R
CO2	Explain the basis and dimensions and demonstrate the related theorems.	PSO1 & PSO2	10	R
CO3	Define the Inner product spaces and also relate the properties of them	PSO1 & PSO2	12	AN
CO4	Recall the Definition of Matrices	PSO1 & PSO2	7	R
CO5	List out the Types of Matrices and illustrate them	PSO1 & PSO2	7	AN
CO6	Define simultaneous linear equations and Solve the Eigen values and Eigen Vectors.	PSO1 & PSO2	12	AP

UNIT I **LECTURE HOUR: 12**

Vector Spaces

Introduction (Basic concepts) -Definition and Examples (Related problems) –Subspaces (Statement and Related problems) –Linear Transformations (Definition and Related Problems) -Span of a set-Linear Independence (Definition and Related Problems).

UNIT II **LECTURE HOUR: 10**

Basis and Dimensions

Basis and Dimensions (Related problems) -Rank and Nullity (Related problems) –Matrix of a Linear Transformations (Related problems).

UNIT III **LECTURE HOUR: 12**

Inner Product Spaces

Introduction (Basic concepts) - Definition and Examples (Related problems) - Orthogonality (Basic concepts) – Orthogonal Complement (Related problems).

UNIT IV **LECTURE HOUR: 14**

Theory of Matrices

Introduction (Basic concepts) - Algebra of Matrices (Related problems) -Types of matrices (Definitions and Related problems) -The inverse of a matrix (Related problems) - Rank of a Matrix (Related problems).

UNIT V **LECTURE HOUR: 12**

Eigen values and Eigen vectors

Simultaneous linear Equations (Related problems) -Characteristic equation and Cayley - Hamilton Theorem (Related problems) -Eigen values and Eigen Vectors (Related problems).

TEXT BOOK:

T1. Modern Algebra, S. Arumugam & Issac. A. T, Scitech publications, pvt. Ltd, 2015.

REFERENCE BOOK:

R1. Linear Algebra, R. R Mahajan, M.l Bhave, V.G.Joshi ,S.Chand & Company Ltd, Second Edition 1984.

Course Title : **LINEAR ALGEBRA (P)**	Course Code : **53P**
Semester : **V**	Course Group : **DSE-III**
Teaching Scheme in Hrs (L:T:P) : **0:0:4**	Credits : **2**
Map Code: **G (PRACTICAL PROGRAMMING)**	Total Contact Hours: **60**
CIA: **40 Marks**	SEE # :**60 Marks**
Programme: **BSc-MATHEMATICS**	**# - Semester End Exam**

LIST OF EXPERIMENTS:

UNIT-I

1. Solving linear systems and matrices by using Matlab.
2. Solving Matrix operations by using Matlab.
3. Solving Inverse matrix and Determinants by using Matlab.
4. Solving Linear transformations by using Matlab.
5. Solving Vector spaces by using Matlab.
6. Solving Linear independence by using Matlab.
7. Solving Basis and dimension by using Matlab.
8. Solving Homogeneous systems by using Matlab.
9. Solving rank of the matrix by using Matlab.
10. Solving Change of basis by using Matlab.
11. Solving Orthonormal bases by using Matlab.
12. Solving Orthogonal complements by using Matlab.
13. Solving Eigenvalues and eigenvectors by using Matlab.
14. Solving Diagonalization by using Matlab.
15. Solving Symmetric matrices by using Matlab.

TEXT BOOKS:

T1: Understanding Linear Algebra Using MATLAB, Erwin Kleinfeld, Margaret Kleinfeld, Prentice Hall publication, 2001.

T2: Linear Algebra Labs with MATLAB, David R. Hill, David E. Zitarelli, Prentice Hall publication, 3rd edition, 2004.

Course Title : **LATEX (T)**	Course Code : **53B**
Semester : **V**	Course Group : **DSE – III**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **4**
Map Code: **F(PROBLEM – ANALYSIS)**	Total Contact Hours: **60**
CIA: **25 Marks**	SEE # :**75 Marks**
Programme: **B.Sc MATHEMATICS**	**# -- Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl. Ses	CL
CO1	Be able to typeset and control key LaTeX environments.	PSO3	10	U
CO2	Understand the use of packages to control document style elements.	PSO3	7	U
CO3	Know how to use style files to typeset to specific thesis and journal styles.	PSO3	7	AP
CO4	Be familiar with good practice and proper LaTeX work-flow for efficient best practice.	PSO3	7	AP
CO5	Be aware of a range of online resources to support your use of LaTeX.	PSO3	7	U
CO6	Able to write a journal article or PhD thesis using LaTeX.	PSO3	10	U
CO7	Use LaTeX to produce high-quality documents and to write a thesis that follows the University of Bath style guidelines.	PSO3	12	AP

UNIT I **LECTURE HOUR: 10**

Basics Introduction

Just what is LATEX (Definition and Examples) - TEX and it's off spring (Explanations with Examples).

Text, Symbols, and Commands

Basics of a LATEX file (Explanations with Examples) - Command names (Definition and Examples) – Arguments (Explanations with Examples) – Environments (Explanations with Examples).

UNIT II **LECTURE HOUR: 14**

Text, Symbols, and Commands, Document Layout and Organization

Declaration (Definition and Examples) – Lengths (Definition and Examples) - Special Characters (Definition and Examples) - Fine-tuning text (Explanations with Examples)- Word division (Explanations with Examples)- Document class(Explanations with Examples).

UNIT III **LECTURE HOUR: 14**

Document Layout and Organization

Page style and Parts of the document Table of contents (Definition and Examples) - Table of contents (Definition and Examples) - Changing font (Explanations with Examples) - Centering and indenting Lists, Generalized lists (Explanations with Examples) - Theorem Like declarations, Tabulator stops, Boxes (Explanations with Examples).

UNIT IV **LECTURE HOUR: 10**

Displayed text

Tables (Explanations with Examples) - Printing literal text (Explanations with Examples) - Footnotes and marginal notes (Explanations with Examples).

UNIT V **LECTURE HOUR: 12**

Mathematical formulas

Drawing pictures with LATEX (Explanations with Examples) - Mathematical symbols (Explanations with Examples).

TEXT BOOK:

T1. A Guide to LATEX, H. Kopka and P.W. Daly, Fourth Edition, Addison – Wesley, London, 2003.

REFERENCE BOOK:

R1. A Guide to LATEX, H. Kopka and P.W. Daly, Third Edition, Addison – Wesley, London, 1999.

Course Title : **LATEX (P)**	Course Code : **53P**
Semester : **V**	Course Group : **DSE – III**
Teaching Scheme in Hrs (L:T:P) : **0:0:4**	Credits : **2**
Map Code: **G (PRACTICAL PROGRAMMING)**	Total Contact Hours: **60**
CIA: **40 Marks**	SEE # : **60 Marks**
Programme: **B.Sc MATHEMATICS**	**# -- Semester End Exam**

LIST OF EXPERIMENTS:

UNIT-I

1. Program for Title with author name and date, Special characters , Commenting in Tex documents , insert comments, Font attributes , Font sizes in a LaTeX document.
2. Program for Line-spacing, Program for Text justification, Program for column spacing, Program for Itemization, Program for margins, Program for Header in a LaTeX.
3. Program for Structured document, Math text inclusion with equation, Inline equations, Math equations, Multiline equations, Matrices in a LATEX.
4. The Latex code for columns spanning multiple rows**,** Table creation, Types of tables, sideways table.
5. Write an algorithm for find the minimization of cost function
6. Write an algorithm to find the digraph is connected or not.
7. Program for Creating bibliography, Index and Nomenclature.

TEXT BOOK:

T1. A Guide to LATEX, H. Kopka and P.W. Daly, Fourth Edition, Addison – Wesley, London, 2003.

Course Title : **EDC-COMPUTATIONAL MATHEMATICS (T)**	Course Code : **5EM**
Semester : **V**	Course Group : **DSE**
Teaching Scheme in Hrs (L:T:P) : **5:1:0**	Credits : **6**
Map Code: **F(PROBLEM – ANALYSIS)**	Total Contact Hours: **90**
CIA: **25 Marks**	SEE # :**75 Marks**
Programme : **BSc-MATHEMATICS**	# - **Semester End Exam**

No	Course Outcome Cos) : After completion of this course, the students will be able	POs	Cl. Ses	CL
CO1	Define the basic concepts of Geometry, and solve their related problems.	PO1	18	AP
CO2	Explain the area of shapes and solve the related theorems.	PO1	18	AP
CO3	Explain the word problems and also relate the sets, geometry and measurement problems.	PO1	18	AN
CO4	Explain the Data Interpretation and List out the types of charts and graphs	PO1	16	AP
CO5	Explain the reasoning and solve the puzzles.	PO1	10	AP
CO6	Define the Inequalities and Solve the coded, mathematical inequalities, coding and decoding, seating arrangements.	PO1	10	AP

UNIT I **LECTURE HOUR: 18**

Geometry

Line (Definition and Related Problems) - Intersecting lines and Angles (Definition and Related Problems) - Perpendicular Lines (Definition and Related Problems) - Parallel lines (Definition and Related Problems) - Polygons(Definition and Related Problems).

UNIT II **LECTURE HOUR: 18**

Area of Shapes

Triangles (Definition and Related Problems) – Quadrilaterals (Definition and Related Problems) –Circles (Definition and Related Problems) -Rectangular Solids and Cylinders (Definition and Related Problems) - Coordinate Geometry (Definition and Related Problems).

UNIT – III **LECTURE HOUR: 18**

Word Problems

Sets (Definition and Related Problems) - Geometry Problems (Definition and Related Problems) - Measurement problems (Definition and Related Problems).

UNIT – IV **LECTURE HOUR: 16**

Data Interpretation

Pie Charts (Definition and Related Problems) -Tables (Related problems) -Bar Charts (Definition and Related Problems) - Graphs (Definition and Related Problems) - Line Charts (Definition and Related Problems).

UNIT – V **LECTURE HOUR: 20**

Reasoning

Puzzles (Related problems) - Coded Inequalities (Definition and Related Problems) - Mathematical Inequalities (Definition and Related Problems) - Coding and Decoding (Definition and Related Problems) -Seating Arrangements (Definition and Related Problems).

TEXT BOOKS:

T1 : GMAT Official Guide 2019, John Wiley & Sons Inc, 2019 (UNITS : I, II &III).

T2 : Quantitative Aptitude, R.S. Aggarwal, S. Chand & Company Ltd, 2008 (UNITS : IV &V).

REFERENCE BOOKS:

R1: Power Score GMAT Critical Reasoning Bible, David M. Killoran, Nation's Leader in GMAT preparation, 2019.

R2: Quantitative Aptitude for All Competitive Examinations, Abhijit Guha , Mc Graw Hill Education, 2016.

Course Title : **COMPREHENSIVE MATHEMATICS (T)**	Course Code : **54C**
Semester : **V**	Course Group : **SEC-II-B**
Teaching Scheme in Hrs (L:T:P) : **4:0:0**	Credits : **4**
Map Code: **F(PROBLEM – ANALYSIS)**	Total Contact Hours: **60**
CIA: **100 Marks**	SEE # :
Programme : **BSc-MATHEMATICS**	# - **Semester End Exam**

No	Course Outcome Cos) : After completion of this course, the students will be able	PSOs	Cl.Ses	CL
CO1	Define the basic concepts of Geometry, and solve their related problems.	PSO1, PSO2	12	AP
CO2	Explain the area of shapes and solve the related theorems.	PSO1, PSO2	12	AP
CO3	Explain the word problems and also relate the geometry and measurement problems	PSO1, PSO2	12	AN
CO4	Explain the Data Interpretation and List out the types of charts and graphs	PSO1, PSO2	10	AP
CO5	Explain the reasoning and solve the puzzles	PSO1, PSO2	7	AP
CO6	Define the Inequalities and Solve the coded, mathematical inequalities, seating arrangements	PSO1, PSO2	7	AP

UNIT I **LECTURE HOUR: 12**

Geometry

Line (Definition and Related Problems) - Intersecting lines and Angles (Definition and Related Problems) - Perpendicular Lines (Definition and Related Problems) - Parallel lines (Definition and Related Problems).

UNIT II **LECTURE HOUR: 12**

Area of Shapes

Triangles (Definition and Related Problems) – Quadrilaterals (Definition and Related Problems) -Circles (Definition and Related Problems) -Rectangular Solids and Cylinders (Definition and Related Problems).

UNIT – III **LECTURE HOUR: 12**

Word Problems

Geometry Problems (Definition and Related Problems) - Measurement problems (Definition and Related Problems).

UNIT – IV **LECTURE HOUR: 10**

Data Interpretation

Pie Charts (Definition and Related Problems) – Tables (Related problems) - Bar Charts (Definition and Related Problems) - Graphs (Definition and Related Problems) - Line Charts (Definition and Related Problems).

UNIT – V **LECTURE HOUR: 14**

Reasoning

Puzzles (Related problems) - Coded Inequalities (Definition and Related Problems) - Mathematical Inequalities (Definition and Related Problems) - Seating Arrangements (Definition and Related Problems).

TEXT BOOKS:

T1: GMAT Official Guide 2019, John Wiley & Sons Inc, 2019 (UNITS: I, II &III).
T2: Quantitative Aptitude, R.S. Aggarwal, S. Chand & Company Ltd, 2008 (UNITS : IV &V).

REFERENCE BOOKS:

R1: Power Score GMAT Critical Reasoning Bible, David M. Killoran, Nation's Leader in GMAT preparation, 2019.
R2: Quantitative Aptitude for All Competitive Examinations, Abhijit Guha , Mc Graw Hill Education, 2016.

SEMESTER-VI

Course Title : COMPLEX ANALYSIS (T)	**Course Code : 63A**
Semester : VI	**Course Group : DSC- XI**
Teaching Scheme in Hrs (L:T:P) : 5:1:0	**Credits : 6**
Map Code: F (PROBLEM – ANALYSIS)	**Total Contact Hours: 90**
CIA: 25 Marks	**SEE # :75 Marks**
Programme: B.Sc-MATHEMATICS	**# -- Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	CL
CO1	Define the basic concepts of the Analytic functions and solve them.	PSO1 & PSO3	18	AP
CO2	Explain the basic concepts of the Bilinear transformations and solve them.	PSO1 & PSO3	18	AP
CO3	Update Complex integration	PSO1 & PSO3	18	U
CO4	Demonstrate the Taylor's and Laurent's Series and classify the types of singularities	PSO1 & PSO3	16	AP
CO5	Solve the Calculus of Residues	PSO1 & PSO3	10	AP
CO6	Update Meromorphic function	PSO1 & PSO3	10	U

UNIT – I **LECTURE HOUR:18**

Analytic functions: Complex functions (Definitions)– Limit of a function (Definitions and Theorems) – Continuity of a function (Theorems and Examples) – Uniform continuity (Theorems and Examples) – Differentiability and analyticity of a function (Theorems and Examples) – Necessary conditions for differentiability (Theorems and Examples) – Sufficient conditions for differentiability (Theorems and Examples) – C.R. equations in polar co-ordinates (Theorems and Examples) – complex function as a functions of Z and $\bar{Z}$ – Examples (Theorems and Examples).

UNIT – II **LECTURE HOUR:18**

Bilinear transformation: Bilinear transformation (Theorems and Examples) - Cross ratio (Theorems and Examples) – Fixed points (Theorems and Examples) -Transformation which

map real axis to real axis (Theorems and Examples) - Unit circle to unit circle-real axis to unit circle (Theorems and Examples).

UNIT – III **LECTURE HOUR:18**

Complex integration: Cauchy's Integral Theorem (Theorem)- Cauchy's Integral formula (Theorem)- Derivatives of analytic function (Derivatives and Theorems)- Morera's Theorem (Statement and Proof) – Cauchy's Inequality (Statement and Proof) – Liouville's Theorem (Statement and Proof) – Fundamental Theorem(Statement and Proof) - Fundamental Theorem of Algebra (Statement and Proof).

UNIT – IV **LECTURE HOUR:16**

Taylor's and Laurent's Series; Taylor's Theorem (Statement and Proof) - Taylor's Series (Related Problems)- Laurent's Series-Singular points (Theorems and Related Problems)– Types of Singularities (Related Problems) – Properties of Singularities (Related Theorem) - Identification of Singularities (Related Problems).

UNIT – V **LECTURE HOUR:20**

Residue: calculation of residues (Related Problems) – Residue theorem (Theorems and Related Problems) – Real definite integrals (Related Problems)

Meromorphic function: Principles of argument (Statement and Proof) -Rouche's theorem (Statement and Proof) - Fundamental theorem of Algebra (Statement and Proof) - Hurwitz's theorem (Statement and Proof) - Function meromorphic in the extended plane (Statement and Proof).

TEXT BOOK:

T1. "Complex Analysis" by Duraipandian and Laxmi Duraipandian – Emerald Publications

UNIT – I	Chapter – 4	Section 4.1 – 4.10
UNIT – II	Chapter – 7	Section 7.1 – 7.9
UNIT – III	Chapter – 8	Section 8.1 – 8.11, 8.13
UNIT – IV	Chapter – 9	Section 9.1 – 9.13
UNIT – V	Chapter – 10 & 11	Section 10.1 – 10.4 & 11.1 – 11.3

REFERENCE BOOK:

Complex Analysis – T.K.M. Pillai, S.P. Rajagopalan, R. Sattanathan.

Course Title : **ELEMENTARY NUMBER THEORY (T)**	Course Code: **63B**
Semester : **VI**	Course Group: **DSC-XII**
Teaching Scheme in Hrs (L:T:P) : **5:1:0**	Credits : **6**
Map Code: F **(PROBLEM – ANALYSIS)**	Total Contact Hours: **90**
CIA: **25 Marks**	SEE #: **75 Marks**
Programme: **BSc-MATHEMATICS**	# - **Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	CL
CO1	Define the Division and Euclidean algorithm	PSO4	18	R
CO2	Apply the concept of Congruence's and its higher degree	PSO4	18	AN
CO3	Demonstrate the various types of Prime Power Moduli	PSO4	16	U
CO4	Apply the concept of Multiplicative groups , Rings and fields	PSO4	10	AN
CO5	Define the function of Quadratic residues	PSO4	10	R
CO6	Explain the concept of Jacobi symbol and Moebius inversion formula	PSO4	18	U

UNIT I: **Lecture hour: 18**

DIVISIBILITY

Divisibility (Definition, Theorems and Examples) -Division Algorithm (Related Problems) - Greatest Common Divisor (Definition and problems) - Euclidean algorithm (Definition, Theorems and Examples)- Primes (Definition, Theorems and Examples).

UNIT II: **Lecture hour: 18**

CONGRUENCES

Congruence's (Definition, Theorems and Examples)- Solution of Congruence's (Definition, Theorems and Examples)- Congruence's of Degree 1(Definition, Theorems and Examples)- The function Ø(n) (Definition, Theorems and Examples) - Congruence's of Higher Degree (Definition, Theorems and Examples).

UNIT III: **Lecture hour: 16**

CONGRUENCES

Prime Power Moduli (Definition, Theorems and Examples)- Prime Modulus (Definition, Theorems and Examples)- Congruence's of Degree Two, Prime Modulus, Power /Residues (Definition, Theorems and Examples).

UNIT IV: **Lecture hour: 20**

CONGRUENCES &QUADRATIC RECIPROCITY

Number theory /form an Algebraic view Point (Definition, Theorems and Examples)- Multiplicative Groups, Rings & fields (Definition, Theorems and Examples)- Quadratic Residues (Definition, Theorems and Examples)- Quadratic Reciprocity (Definition, Theorems and Examples).

UNIT V: **Lecture hour: 18**

QUADRATIC RECIPROCITY&SOME FUNCTIONS OF NUMBER THEORY

The Jacobi Symbol (Definition, Theorems and Examples)- Greatest Integer Function (Definition, Theorems and Examples)- Arithmetic Functions (Definition, Theorems and Examples)- The Moebius Inversion Formula (Definition, Theorems and Examples).

TEXT BOOK:

T1. An Introduction to Theory of Numbers by Ivan Nivan and Herberts Zucherman.

REFERENCE BOOK:

R1. T.M. Apostol, Introduction to Analytic Number Theory, Springer Verlag, 1976.

Course Title : **DISCRETE MATHEMATICS (T)**	Course Code: **63C**
Semester : **VI**	Course Group: **DSE-IV**
Teaching Scheme in Hrs (L:T:P) : **5:1:0**	Credits : 6
Map Code: **F (PROBLEM – ANALYSIS)**	Total Contact Hours: **90**
CIA: **25 Marks**	SEE # : **75 Marks**
Programme: **B.Sc-MATHEMATICS**	**# - Semester End Exam**

No	Course Outcome (Cos) : After completion of this course, the students will be able	PSOs	Cl..Ses	CL
CO1	Define the basic concepts of Mathematical Logic	PSO1 & PSO3	18	R
CO2	Explain the concepts of relations and functions	PSO1 & PSO3	10	U
CO3	Demonstrate the Algebraic Structures of groups	PSO1 & PSO3	10	U
CO4	Classify the formal languages and automata and develop for the types of grammar	PSO1 & PSO3	16	AP
CO5	Apply Lattices and Boolean Algebra and interpret it.	PSO1 & PSO3	18	AN
CO6	Define the basic concept of Graph Theory and apply for simple theorems.	PSO1 & PSO3	18	AP

UNIT-I: MATHEMATICAL LOGIC **Lecture hour: 18**

Connections well-formed formulas (Definition and Examples) –Tautology (Definition and Examples)– Equivalence of formulas (Definition and Examples)- Tautological implications (Definition and Examples)-Duality law (Definition and Examples)- Normal forms (Definition and Examples)- Predicates (Definition and Examples)- Variables (Definition and Examples)- Quantifiers (Definition and Examples)- Free and bound Variables (Definition and Theorems) - Theory of inference for predicate calculus (Definition and Theorems).

UNIT-II: RELATIONS AND FUNCTIONS **Lecture hour: 20**

Composition of relations (Definition and Examples)-Composition of functions (Definition and Examples)- Inverse functions (Definition and Examples)-one-to- one, onto, one-to-one& onto-onto functions (Definition and Examples)- Hashing functions (Definition and Theorems) - Permutation function (Definition and Theorems) -Growth of functions (Definition and Theorems). **Algebra structures:** Semi groups, Free semi groups (Definition and Theorems), Monoids (Definition and Examples).

UNIT-III: FORMAL LANGUAGES AND AUTOMATA **Lecture hour: 16**

Regular expressions (Examples) -Types of grammar (Theorem)-Regular grammar and finite state automata (Definition and Theorems) - Context free and sensitive grammars (Definition and Theorems).

UNIT-IV: LATTICES AND BOOLEAN ALGEBRA **Lecture hour: 18**

Partial ordering (Definition and Examples)- Posets (Definition and Examples)-Lattices (Definition and Examples)-Boolean algebra (Definition and Theorems) -Boolean functions (Definition and Theorems) -Theorems-Minimization of Boolean functions (Definition and Theorems).

UNIT-V: GRAPH THEORY **Lecture hour: 18**

Directed and undirected graphs (Definition and Theorems) - Paths-Reachability-Connectedness (Definition and Theorems) - Matrix representation, Euler paths (Definition and Theorems) - Hamiltonian paths (Definition and Theorems) -Trees-Binary trees (Definition and Theorems-simple theorems and applications (Definition and Theorems).

TEXT BOOK:

T1. J.P Tremblay and R.P Manohar "Discrete Mathematical Structures with applications to computer science", Mc.Graw Hill, 1975.

REFERENCE BOOKS:

R1. J.K.Sharma, "Discrete Mathematics",Macmillan India Ltd, 2003.
R2. S.Iyengar and others "Discrete Mathematics", Vikas Publications, 2003.
R3. Narsingh Deo"Graph Theory for Computer science & Engineers"India.

Course Title : **MATLAB (T)**	Course Code: **63C**
Semester : **VI**	Course Group: **DSE-IV**
Teaching Scheme in Hrs (L:T:P) : **5:1:0**	Credits : 6
Map Code: **F (PROBLEM – ANALYSIS)**	Total Contact Hours: **90**
CIA: **25 Marks**	SEE # : **75 Marks**
Programme: **B.Sc-MATHEMATICS**	**# - Semester End Exam**

No	Course Outcome (Cos): After completion of this course, the students will be able to	PSOs	Cl.Ses	CL
CO1	Define the basic concept of starting windows and solve the MATLAB applications	PSO1& PSO3	10	AP
CO2	Define how to creating arrays and solve them in MATLAB	PSO1& PSO3	10	AP
CO3	Demonstrate the Mathematical operations with arrays and solve them in MATLAB	PSO1& PSO3	16	AP
CO4	Explain the two dimensional and three dimensional plots and solve them in MATLAB	PSO1& PSO3	18	AP
CO5	Explain the Relational and logical operators and solve the programming in MATLAB	PSO1& PSO3	18	AP
CO6	Demonstrate the polynomials, curve fitting and interpolation and solve them in MATLAB	PSO1& PSO3	18	AP

UNIT I: **Lecture hour: 20**

STARTING WITH MATLAB: Starting MATLAB, MATLAB Windows (Explanations with Examples) - Working in the Command Window (Definition and Examples) - Arithmetic Operations with Scalars (Explanations with Examples) - Display Formats (Explanations with Examples). - Elementary Math Built-In Functions (Definition and Examples) - Defining Scalar Variables (Definition and Examples) - Useful Commands for Managing Variables (Explanations with Examples). -Script Files (Explanations with Examples) - Examples of MATLAB Applications (Examples).

CREATING ARRAYS: Creating a One-Dimensional Array (Vector) (Explanations with Examples) - Creating a Two-Dimensional Array (Matrix) (Explanations with Examples).- Notes about Variables n MATLAB (Explanations with Examples) - The Transpose Operator(Explanations with Examples). -

Array Addressing (Explanations with Examples) - Using a Colon: In Addressing Arrays (Explanations with Examples). - Adding Elements to Existing Variables (Explanations with Examples). - Deleting Elements (Definition and Examples) - Built-In Functions for Handling Arrays (Definition and Examples) - Strings and Strings as Variables (Definition and Examples).

UNIT II **Lecture hour: 16**

MATHEMATICAL OPERATIONS WITH ARRAYS: Addition and Subtraction – Array Multiplication (Definition and Examples) - Array Division (Definition and Examples) - Element-By-Element Operations (Explanations with Examples). - Using Arrays in MATLAB Built-In Math Functions (Explanations with Examples) - Built-In Functions For Analyzing Arrays (Explanations with Examples) - Generation of Random Numbers (Explanations with Examples) - Examples of MATLAB Applications (Examples).

USING SCRIPT FILES AND MANAGING DATA: The MATLAB Workspace and the Workspace Window (Explanations with Examples) - Input to A Script File (Explanations with Examples) - Output Commands (Explanations with Examples) - The Save and Load Commands (Explanations with Examples) - Importing And Exporting Data (Explanations with Examples) - Examples of MATLAB Applications (Examples).

UNIT III **Lecture hour: 18**

TWO-DIMENSIONAL PLOTS: The plot Command (Explanations with Examples)- The fplot Command (Explanations with Examples)- Plotting Multiple Graphs in the Same Plot(Explanations with Examples) - Formatting a Plot (Explanations with Examples)- Plots With Logarithmic Axes (Explanations with Examples)- Plots With Error Bars(Explanations with Examples) - Plots With Special Graphics(Definition and Examples) - Histograms - Polar Plots - Putting Multiple Plots on the Same Page - Multiple Figure Windows - Examples of MATLAB Applications(Examples)..

THREE-DIMENSIONAL PLOTS: Line Plots (Definition and Examples) - Mesh and Surface Plots (Definition and Examples) - Plots with Special Graphics (Explanations with Examples) - The View Command (Definition and Examples) - Examples Matlab Applications (Examples).

UNIT IV **Lecture hour:18**

PROGRAMMING IN MATLAB: Relational and Logical Operators (Explanations with Examples) - Conditional Statements(Explanations with Examples) -The Switch-Case Statement (Explanations with Examples) – Loops (Definition and Examples) - Nested Loops and Nested Conditional Statements (Definition and Examples) – The Break and Continue Commands (Definition and Examples) - Examples of MATLAB Applications (Examples)..

USER-DEFINED FUNCTIONS AND FUNCTION FILES: Creating A Function File (Explanations with Examples) – Structure of a Function File (Explanations with Examples)- Local And Global Variables(Explanations with Examples) - Saving A Function File (Definition and Examples) - Using A User-Defined Function (Definition and Examples) - Examples of Simple User-Defined Functions (Definition and Examples) - Comparison Between Script Files and Function Files (Explanations with Examples)- Anonymous And Inline Functions (Explanations with Examples) - Function Functions (Definition and Examples) – Sub functions (Definition and Examples) - Nested Functions (Definition and Examples) - Examples Of MATLAB Applications (Examples).

UNIT V **Lecture hour: 18**

POLYNOMIALS, CURVE FITTING, AND INTERPOLATION: Polynomials (Definition and Examples) - Curve Fitting (Explanations with Examples)-Interpolation (Definition and

Examples) - The Basic Fitting Interface (Definition and Examples) - Examples of MATLAB Applications (Examples)..

APPLICATIONS IN NUMERICAL ANALYSIS: Solving an Equation with One Variable (Explanations with Examples) -Finding a Minimum or a Maximum of a Function (Definition and Examples) - Numerical Integration (Definition and Examples) - Ordinary Differential Equations (Definition and Examples) - Examples of MATLAB Applications (Examples).

TEXT BOOK:

T1. Treatment as in:MATLAB An Introduction with Applications By AmosGilat. JOHN WILEY & SONS, INC.2011.

REFERENCE BOOKS:

R1. Getting Started with MATLAB – A Quick Introduction for Scientists and Engineers, Rudra Pratap. Oxford University Press.

R2. Introduction to MATLAB 7 for Engineers By William John Palm. McGraw-Hill Professional, 2005.

R3. Introduction to MATLAB 7 By Dolores M. Etter, David C. Kuncicky, Printice Hall, 20

Course Title : **PROJECT AND VIVA VOCE**	Course Code : **63R**
Semester : **VI**	Course Group : **DSE–V**
Teaching Scheme in Hrs (L:T:P) : **6:0:0**	Credits : **6**
Map Code: **I (PROJECT)**	Total Contact Hours: **90**
CIA: **40 Marks**	SEE # :**60 Marks**
Programme: **B.Sc MATHEMATICS**	**# -- Semester End Exam**

PROJECT AND VIVA- VOCE

- Students should do the project in any one of the following topic.
- At the end of the semester the students must submit the project Record to the concern Guide.
- Viva Voce Examination will be jointly conducted on the End of Semester.

1. Simplex Method
2. Big M Method
3 .Duality Simplex Method
4. North West Corner Method
5. Least Cost Method
6. Vogel's Approximation Method
7. Modi Method
8. Hungarian Method
9. Travelling Sales Man Problem
10. Game theory Two Persons Zero sum maxima and minima
11. Rectangular Games
12. Mixed Strategies.
13. Graphical Method
14. Generating Random Number
15. Monte Carlo Simulation
16. Simulation by using Queuing Theory
17. M/M/I : $\infty/FIFO$
18. M/M/I : $N/FIFO$
19. M/M/C : $\infty/FIFO$
20. M/M/C : $N/FIFO$
21. EOQ Problems with no shortages
22. EOQ Problems with shortages
23. Production Problems with no shortages
24. Production Problems with shortages
25. Price break Problem