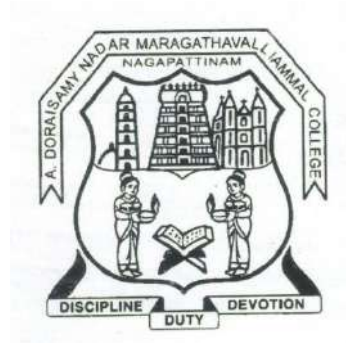


A.D.M COLLEGE FOR WOMEN (AUTONOMOUS),
(Nationally Re-accredited with 'A' Grade by NAAC- 3rd Cycle)
NAGAPATTINAM-611 001

PG & RESEARCH DEPARTMENT OF MATHEMATICS
(for the candidates admitted from the academic year 2021-2024)



B.Sc., MATHEMATICS

SYLLABUS

2021-2024

**A.D.M COLLEGE FOR WOMEN (AUTONOMOUS),
Nagapattinam**

UG Programme - B.Sc Mathematics

(For the candidates admitted from 2021 – 2024 onwards)

Bloom's Taxonomy Based Assessment Pattern

Knowledge Level

K1 – Acquire/Remember	K2 – Understanding	K3 – Apply	K4 – Analyze	K5 – Evaluate	K6 – Create
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1. Part I, II and III

Theory (External + Internal = 75 + 25 = 100 marks)

External/Internal					
Knowledge Level	Section	Marks	Hrs.	Total	Passing Mark
K1-K3	A (Answer all)	$10 \times 2 = 20$	3	75	30
K3-K6	B (Either or pattern)	$5 \times 5 = 25$			
K3-K6	C (Answer 3 out of 5)	$3 \times 10 = 30$			

PG DEPARTMENT OF MATHEMATICS
(for the candidates admitted from the academic year 2021-2024)
B.Sc., Mathematics

Programme Educational Objectives (PEO):

PEO 1:	To gain knowledge in fundamental ideas of mathematics and to develop the mathematical thinking.
PEO 2:	To provide the highest level of education in mathematics and to produce competent and creative Mathematicians.
PEO 3:	To enable the learners to solve mathematical problems using mathematical techniques.
PEO 4:	To communicate mathematics accurately, precisely and effectively.
PEO 5:	To inculcate the mathematical concepts, intellectual skills, courage and integrity, sensitivity to the needs and aspiration of the society among the learners.

Programme Outcomes (POs)UG

On completion of the course the learner will be able to

PO 1:	Apply the basic concepts of mathematics to formulate and evaluate the real- world problems.
PO 2:	Utilize the mathematical principles to think analytically, systematically and critically while solving problems and making decisions.
PO 3:	Construct the logical arguments and apply the laws of logic in mathematical proofs.
PO 4:	learn and apply the appropriate methods and procedures in MATLAB, SPSS etc.
PO 5:	Pursue careers in academia, industry and the other areas of Mathematics.

Programme Specific Outcomes (PSO) B.Sc.,

On completion of the course the learner will be able

PSO 1:	Identify the applications of mathematics in other disciplines and society.
PSO 2:	Formulate and develop mathematical arguments in a logical manner.
PSO 3:	Able to identify, locate and solve the issue or problem effectively.
PSO 4:	Acquire good knowledge in advanced areas of mathematics.
PSO 5:	Understand and formulate quantitative models arising in social science, business and other contexts.

PG AND RESEARCH DEPARTMENT OF MATHEMATICS

COURSE STRUCTURE OF THE UG PROGRAMME

B. Sc., Mathematics 2021- 2024 Batch

STRUCTURE OF THE PROGRAMME

Part	Title of the part	No. of Courses	Hours	Credit
I	LC- Language Course	4	24	12
II	ELC – English Language Course	4	24	12
III	CC- Core Course	15	72	67
	AC –Allied Course	6	27	18
	MBE - Major Based Elective	3	16	13
IV	NME - Non- Major Elective	2	4	4
	SBE - Skill Based Elective	3	6	6
	SSD – Soft Skill Development	1	2	2
V	ES - Environmental Studies	1	2	2
	VE - Value Education	1	2	2
	EA - Extension Activities	-	-	1
	GS - Gender Studies	1	1	1
	Total		41	180

Extra Credit Course

Year	Semester	Course	Title of the Course	Instructional hours	Hours/ Week	Credit	Total Marks
I UG	I	Extra Credit Course	Business Mathematics I	30	3	2	100
	II		Business Mathematics II	30	3	2	100

A.D.M. COLLEGE FOR WOMEN (AUTONOMOUS), NAGAPATTINAM
DEPARTMENT OF MATHEMATICS

B.Sc., MATHEMATICS

Course Structure under CBCS

(for the candidates admitted from the academic year 2021-2024 onwards)

Sem.	Part	Course Code	Course	Ins. Hrs	Credit	Exam Hours	Marks		Total Marks
							CIA	SE	
I	I	LCTA	LC - Language Course –I Tamil I	6	3	3	25	75	100
	II	LCEA	ELC – English Language Course English I	6	3	3	25	75	100
	III	MUA	CC- Core Course I Differential Calculus and Trigonometry	5	5	3	25	75	100
		MUB	CC- Core Course II Classical Algebra	4	4	3	25	75	100
		PUA1	AC –Allied Course I Physics I	4	4	3	25	75	100
		PUA2Y	AC –Allied Course II Physics II (Practical)	3	-	-	-	-	-
	IV	VE	Value Education	2	2	3	25	75	100
Total				30	21	-	-	-	600
II	I	LCTB	LC- Language Course Tamil II	6	3	3	25	75	100
	II	LCEB	ELC – English Language Course English II	6	3	3	25	75	100
	III	MUC	CC - Core Course III Integral Calculus	5	4	3	25	75	100
		MUD	CC- Core Course IV Analytical Geometry of Three Dimensions	4	4	3	25	75	100
		PUA2Y	AC -Allied Course II Physics II (Practical)	3	3	3	40	60	100
		PUA3	AC -Allied Course III Physics III	4	2	3	25	75	100
	IV	ES	ES – Environmental Studies	2	2	3	25	75	100
Total				30	21	-	-	-	700

III	I	LCTC	LC- Language Course Tamil III	6	3	3	25	75	100
	II	LCEC	ELC – English Language Course English III	6	3	3	25	75	100
	III	MUE	CC - Core Course V Differential Equations and Laplace Transforms	4	4	3	25	75	100
		MUF	CC - Core Course VI Vector Calculus and Fourier Series	5	5	3	25	75	100
	SUA1	AC - Allied Course IV Mathematical Statistics I	4	4	3	25	75	100	
	SUA2Y	AC -Allied Course V Statistics Practical	3	-	-	-	-	-	
	IV	MUE1	NME -Non Major Elective I Mathematics for Competitive Examinations I/ Quantitative Aptitude I	2	2	3	25	75	100
	Total				30	21	-	-	-
IV	I	LCTD	LC- Language Course Tamil IV	6	3	3	25	75	100
	II	LCED	ELC – English Language Course English IV	6	3	3	25	75	100
	III	MUG	CC - Core Course VII Sequences and Series	4	4	3	25	75	100
		MUH	CC - Core Course VIII Number Theory	4	4	3	25	75	100
		SUA2Y	AC - Allied Course V Statistics Practical	3	3	3	40	60	100
	SUA3	AC - Allied Course VI Mathematical Statistics II	3	2	3	25	75	100	
	IV	MUE2	NME - Non Major Elective II Mathematics for Competitive Examinations II/ Quantitative Aptitude II	2	2	3	25	75	100
	V	MUS1	SBE – Skill- Based Elective I Statistical Programming using Computational Packages/ Introduction to MATLAB	2	2	3	25	75	100
	Total				30	23	-	-	-

V	III	MUI	CC - Core Course IX Algebra	6	6	3	25	75	100
		MUJ	CC- Core Course X Real Analysis	6	5	3	25	75	100
		MUK	CC - Core Course XI Mechanics	6	5	3	25	75	100
		MUE3	MBE –Major Based Elective I Operations Research/ Logic and Boolean Algebra	6	5	3	25	75	100
	IV	MUS2	SBE –Skill Based Elective II Quantitative Aptitude/ Introduction to Fuzzy Mathematics	2	2	3	25	75	100
		MUS3	SBE – Skill Based Elective III Documentation in Latex / R- Lab with Practical	2	2	3	25	75	100
		SSD	Soft Skills Development	2	2	3	25	75	100
	Total			30	27	-	-	-	700
	VI	III	MUL	CC- Core Course – X II Complex Analysis	6	6	3	25	75
MUM			CC- Core Course – XIII Numerical Methods with C Programming(Theory)	5	4	3	25	75	100
MUNY			CC - Core Practical – XIII (P) Numerical Methods with C Programming(Practical)	2	2	3	25	75	100
MUO			CC – Core Course XIV Astronomy	6	5	3	25	75	100
MUE4			MBE – Major Based Elective II Stochastic Processes/ Discrete Mathematics	5	4	3	25	75	100
MUE5			MBE – Major Based Elective III Graph Theory/ Mathematical Modeling	5	4	3	25	75	100
V			EA - Extension Activities	-	1	-	-	-	-
		GS	GS - Gender Studies	1	1	3	25	75	100
Total			30	27	-	-	-	700	
Grand Total			180	140	-	-	-	4100	

Semester-I / Core Course-I (CC)	DIFFERENTIAL CALCULUS AND TRIGONOMETRY	Course Code: MUA
Instruction Hours: 5	Credits: 5	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K 1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To inculcate the basics of differentiation and their applications. • To introduce the notion of curvatures, circle and radius of curvature. • To develop conceptual understanding on evolutes & involutes and polar co-ordinates.. • To acquire the basic knowledge of circular and hyperbolic functions of complex variables. • To develop skill in summing up infinite trigonometric series using appropriate methods. 	
UNIT	CONTENT	HOURS
I	Successive Differentiation Successive Differentiation – The n^{th} derivative – Standard Results – Fractional expressions –Trigonometrical transformation – Formation of equations involving derivatives –Leibnitz formula for the n^{th} derivative of a product –A complete formal proof for induction –Examples –Geometrical interpretation –Meaning of the sign of the differential coefficient. (Chapter III: Sec 1.1 – 2.2, Chap. IV: Sec 2.1-2.2)	15
II	Envelopes, Curvature of plane curves Curvature – Circle, radius and centre of curvature –Cartesian formula for the radius of curvature. (Chap. X : Sec 2.1-2.3)	15
III	Envelopes, Curvature of plane curves, Maxima and Minima The coordinates of the centre of curvature – Evolute & Involute –Radius of curvature when the curve is given in polar coordinates – p-r equations: pedal equation of a curve -Maxima and	15

	Minima –Theorems(without proof) –Problems. (Chap.X:Sec2.4-2.7&Chap.V:Sec1.1-1.4)	
IV	Hyperbolic functions Introduction –Hyperbolic functions –Relations between hyperbolic functions corresponding to relations between circular functions - Inverse hyperbolic functions. (Chap. IV: Sec. 1-2.3)	15
V	Summation of Trigonometric series Logarithms of complex quantities – Method of Differences Angles in arithmetic progression method –Gregory’s series. (Chap. V: Sec 5 & Chap. VI Sec 1-2, 3.1)	15
VI	Quadrilaterals and Polygons: Area of Cyclic Quadrilaterals – Quadrilaterals Circumscribing a Circle – Regular Polygons. (Chapter VII)	-

Text Books:

1. T.K.ManickavachagamPillai, S.Narayanan, Calculus Volume I, S.V Publications, Chennai, 2019.
2. S. Narayanan, T.K.ManickavachagamPillai, Trigonometry, S.Viswanathan Pvt. Ltd and Vijay Nicole Imprints Pvt. Ltd, 2010.

Reference Books:

1. S.Arumugam and Isaac, Calculus, Volume I, New Gamma Publishing House,1991.
2. S.Arumugam, Isaac, Thangapandi, Trigonometry and Fourier series, New Gamma Publications, revised edition,1999.

Web Resources:

1. [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjj35zRntjyAhUT7HMBHeSqCW4QFnoECCQQAQ&url=http%3A%2F%2Fwww.ru.ac.bd%2Fwpcontent%2Fuploads%2Fsites%2F25%2F2019%2F03%2F205_07_-Courant-Differential-and-Integral-Calculus-Volume 11988.pdf&usg=AOvVaw2PiORiggamgyQk9yWO8DaD](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjj35zRntjyAhUT7HMBHeSqCW4QFnoECCQQAQ&url=http%3A%2F%2Fwww.ru.ac.bd%2Fwpcontent%2Fuploads%2Fsites%2F25%2F2019%2F03%2F205_07_-Courant-Differential-and-Integral-Calculus-Volume%2011988.pdf&usg=AOvVaw2PiORiggamgyQk9yWO8DaD)

2. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiDm4eA79ryAhVW7HMBHWCNCiIQFnoECAQQAQ&url=https%3A%2F%2Fd3bxy9euw4e147.cloudflare.net%2Foscms_prodcms%2Fmedia%2Fdocuments%2Fcalculus-volume-1-5.2-previous.pdf&usq=AOvVaw1MpbBX2Q3wdN4emkR0UNIQ

Course Outcomes

On Completion of the Course, Students should be able to

- CO1 : Apply Leibnitz's Theorem for finding the n^{th} derivative of product of functions
- CO2 : Evaluate envelopes and curvatures of plane curves
- CO3 : Compute maxima and minima of plane curves
- CO4 : Interpret the relation between circular and hyperbolic functions
- CO5 : Find the sum of infinite series using appropriate methods

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	M	S	M	M	M	S	S	S	S	M
CO2	S	S	M	M	M	M	M	S	S	M
CO3	M	S	M	M	M	M	S	M	W	M
CO4	M	M	M	W	M	M	M	S	S	M
CO5	M	M	M	W	M	M	M	S	S	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-I / Core Course-II (CC)	CLASSICAL ALGEBRA	Course Code: MUB
Instruction Hours: 4	Credits: 4	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K 1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To lay a good foundation for the study of theory of equations. • To learn the concepts of algebraic equations and transformation of equations. • To understand the basics of inequalities, maxima and minima. • To study the types of matrices and their inverse. • To inculcate the C-H theorem and its properties. 	
UNIT	CONTENT	HOURS
I	Theory of equations Forming the equations with the given roots – Relation between the roots and coefficients – Symmetric functions of the roots– Sum of the powers of the roots of an equation – Newton’s theorem on the sum of the powers of the roots (Problems only). (Chapter 6: Sec 9- 14)	12
II	Theory of equations Transformations of equations – Reciprocal equation – Diminishing and Increasing the roots – Form of the quotient and remainder when a polynomial is divided by a Binomial – Removal of terms – Descartes’ rule of signs – Simple problems. (Chapter 6: Sec 15 –19 & Sec. 24)	12
III	Inequalities Inequalities – Elementary Principles – Geometric and Arithmetic means – Weirstrass inequalities – Cauchy’s inequality – Applications to Maxima and Minima. (Chapter IV: Sec 1-5,9,11,13)	12
IV	Matrices	12

	<p>Definition and algebraic operations -Types of Matrices – Transpose of a matrix –Singular matrix –Symmetric, Skew-symmetric, Orthogonal, Hermitian, Skew- Hermitian –Adjoint matrix –The Inverse of the matrix –Reciprocal matrix –Reversal law for the inverse of a product –Orthogonal matrices and its properties –Unitary matrix –Rank of the matrix.</p> <p>(Chapter III: Sec 3.1-3.2)</p>	
V	<p>Matrices</p> <p>Simultaneous linear equations (except proof of the theorems) – Eigen values and Eigen vectors –Cayley Hamilton’s theorem(Statement only).(Chapter III: Sec 3.3-3.4)</p>	12
VI	<p>Theory of Equations: To form an equation whose roots are any power of the roots of a given equation – Transformation in General – Rolles’ Theorem – Multiple Roots – Strum’s Theorem. (Chapter 6: Sec 20,21,25, 26 & 27)</p>	-

Text Books:

1. . K. M. Pillai and S. Narayanan, Algebra Vol I, (For Units I and II), S.Viswanathan Printers and Publishers Pvt. Ltd., Chennai, 2019.
2. T. K. M. Pillai, S. Narayanan and K. S. Ganapathy, Algebra Vol II, (For Unit III), S.Viswanathan Printers and Publishers Pvt. Ltd., Chennai, 2015.
3. S.Narayanan, R.HanumanthaRao&T.K.M.Pillai, Ancillary Mathematics Vol I, (Units IV & V), S. Viswanathan (Printers & Publishers) Pvt. Ltd, 2018.

Reference Books:

1. M. L. Khanna, Algebra, Jai PrakashNath& Co, 1974.
2. K. Balakrishnan and N. Ramabathran, Text Book of Modern Algebra, Vikas Publishing House Pvt. Ltd,1978.

Web – Resources:

1. https://www.google.com/search?client=firefox-b-d&q=%E2%80%A2+https%3A%2F%2Fwww.sakshieducation.com%2FEngg%2FEnggAcademia%2FCommonSubjects%2FMathMethods-Fourier_Series.pdf++
2. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiT-9LG8NryAhUw63MBHdUtCIAQFnoECCUQAQ&url=http%3A%2F%2F162.241.27.72%2FsiteAdmin%2Fdde-admin%2Fuploads%2F1%2FUG_B.Sc._Mathematics_113%252013-%2520Classical%2520Algebra.pdf&usg=AOvVaw0JVJ5HeInDE43uVdzKxRmK

Course Outcomes

On Completion of the Course, Students should be able to

CO1	:	understand the aspects of classical algebraic structures.
CO2	:	find the nature of the roots of the equations.
CO3	:	solve and apply the inequalities.
CO4	:	find the inverse and rank of the matrix.
CO5	:	calculate the eigen values and vectors of a matrix and apply the C-H theorem for finding the inverse of a matrix.

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	M	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	W	S	S	S	S	S	M
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M - Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester- II / Core Course-III (CC)	INTEGRAL CALCULUS	Course Code: MUC
Instruction Hours: 5	Credits: 4	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To inculcate the basics of integration. • To study some applications of definite integrals. • To know the techniques for integration. • To find area under plane curves using integration. • To understand the consequences of beta and gamma function. 	
UNIT	CONTENT	HOURS
I	Integration Revision of all integral models – Simple problems. (Chapter 1: Sec 1.1 to 7)	15
II	Integration Definite integrals - Integration by Parts, Reduction formula, Bernoulli's Formula. (Chapter 1: Sec 11,12,13 & 15.1)	15
III	Geometrical Applications of Integration Area under plane curves- Cartesian co-ordinates - Area of a closed curve - Examples - Areas in polar co-ordinates. (Chapter 2: Sec 1.1, 1.2, 1.3 & 1.4)	15
IV	Multiple Integrals Double integrals – Changing the order of Integration – Triple Integrals. (Chapter 5: Sec 1,2.1, 2.2,3.1& Sec 4)	15
V	Improper Integrals: Beta and Gamma Functions Beta & Gamma functions and the relation between them – Integration using Beta & Gamma functions. (Chapter 7: Sec 2.1 to 2.3, 3, 4& 5)	15

VI	Physical Applications of Integration: Centroid – Centre of Mass of an Arc - Centre of Mass of a Plane – Centroid of a Solid of revolution - Centroid of Surface of revolution – Pappu’s Theorems. (Chapter 3: Sec. 1.1 – 1.6)	-
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Text Books:

1. S. Narayanan and T. K. Manickavasagam Pillai, Calculus Volume II , S.Viswanathan (Printers & Publishers) Pvt Ltd, Chennai, 2017

Reference Books:

1. Shanti Narayan, Differential & Integral Calculus, 10th Revised Edition, S.Chand & Co. Ltd, 1962.
2. Shanti Narayan, P. K. Mittal, Integral Calculus, S.Chand & Co. Ltd, 2005.

Web – Resources:

1. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwj35zRntjyAhUT7HMBHeSqCW4QFnoECCQQAQ&url=http%3A%2F%2Fwww.ru.ac.bd%2Fwp-content%2Fuploads%2Fsites%2F25%2F2019%2F03%2F205_07_-Courant-Differential-and-Integral-Calculus-Volume-11988.pdf&usg=AOvVaw2PiORiggamgyQk9yWO8DaD
2. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiR1fGi8dryAhXj4zgGHdLEC80QFnoECAsQAQ&url=https%3A%2F%2Flibrary.um.edu.mo%2Fbooks%2Fb31290735.pdf&usg=AOvVaw2PC91c1qdIP5cs1HYKe1yd>

Course Outcomes

On Completion of the Course, Students should be able to

CO1	:	find the solutions of the integral.
CO2	:	solve the integration by parts.
CO3	:	find the area of plane curves using Cartesian and polar coordinates
CO4	:	find the area by changing the given order of integration
CO5	:	understand the concepts of Beta and Gamma functions

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-II / Core Course-IV(CC)	ANALYTICAL GEOMETRY OF THREE DIMENSIONS	Course Code: MUD
Instruction Hours: 4	Credits: 4	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To familiarize with the three dimensional surfaces and their properties. • To study the straight lines and its properties. • To learn the system of spheres generated by a sphere and plane. • To know the concepts of cone, the tangent lines and tangent plane at a point. • To inculcate the basics of cylinder along with their properties. 	
UNIT	CONTENT	HOURS
I	The Plane Coordinates in Space –Direction cosines of a line in space –Angle between lines in space –Equation of a plane in normal form –Angle between planes– Distance of a plane from a point.	12
II	The Straight line Straight lines in space – line of intersection of planes – plane containing a line- Coplanar lines – Skew lines and shortest distance between skew lines- length of the perpendicular from point to line.	12
III	The Sphere General equation of a sphere- Section of sphere by plane –tangent planes – condition of tangency –system of spheres generated by two spheres –system of spheres generated by a sphere and plane.	12
IV	The Cone Equation of a Cone with a conic as guiding curve – Quadric Cones with vertex at origin –Condition that the general equation of the second degree should represent a cone- The tangent lines and tangent plane at a point.	12

V	The Cylinder Equation of a Cylinder – Enveloping cylinder – the right circular cylinder – equation of a right circular cylinder.	12
VI	The Conicoid: Trace the Ellipsoid – Hyperboloid of one Sheet – Hyperboloid of Two Sheets – Central Conicoid – Intersection of a line and a conicoid.	-

Text Books:

1. Shanthi Narayanan and Mittal P.K, Analytical Solid Geometry, 16th Edition, S.Chand& Co., New Delhi, 2016.
2. N.P. Bali, Analytical Solid Geometry, Laxmi Publications, New Delhi. (**VI Self Learning**)

Reference Books:

1. S. Arumugam and A. Thangapandi Issac, Analytical Geometry 3D and Vector
2. Calculus, New Gamma Publication House, Palayamkottai, 2017.
3. S. G. Venkatachalapthy, Analytical Geometry, Margham Publications, Chennai, 2013.

Web – Resources:

1. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwi2oYSWn9jyAhWL73MBHTXZA4YQFnoECAIQAAQ&url=https%3A%2F%2Fncert.nic.in%2Ftextbook%2Fpdf%2Flemh205.pdf&usg=AOvVaw0meLYIjinSO6fj8F78B89E>
2. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKewix-suL8tryAhWn4jgGHd6xBQkQFnoECAIQAAQ&url=https%3A%2F%2Fkupdf.net%2Fdownload%2Fanalytical-geometry-2d-and-3d-p-r-vittal_58ddb8c6dc0d60560e8970ec_pdf&usg=AOvVaw12pgWfLzw3hkDfC3Y6batx

Course Outcomes

On Completion of the Course, Students should be able to

- | | |
|-----|---|
| CO1 | : understand the three dimensional space, angle between lines and planes. |
| CO2 | : find the coplanar lines, skew lines and to find shortest distance between them. |
| CO3 | : formulate the equation of sphere and their properties. |
| CO4 | : form the equation of cone with a conic as guiding curve and the tangent lines. |
| CO5 | : retrieve the equation of cylinder and right circular cylinder. |

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	M	M	M	M	M	S	S	M
CO2	S	S	M	M	M	M	M	S	S	M
CO3	S	S	M	M	M	M	M	S	S	M
CO4	S	S	M	M	M	M	M	S	S	M
CO5	S	S	M	M	M	M	M	S	S	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-III / Core Course- V (CC)	DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	Course Code: MUE
Instruction Hours: 4	Credits: 4	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> To study the higher order linear differential equations with constant coefficients. To find the solutions of linear differential equations with variable coefficients . To acquire the knowledge of complete, singular and particular integrals of first order PDE. To compute solutions of PDEs using Charpits method. To gain the basic knowledge of Laplace transforms and its inverse with applications. 	
UNIT	CONTENT	HOURS
I	Linear Differential equations with constant coefficients Evaluation of particular integral of e^{ax} , $\cos ax$, $\sin ax$, x^k , where k is a positive integer and $e^{ax}f(x)$ where $f(x)$ is any function of x . (Chapter 2: Sections 1 to 4).	12
II	Linear Equations with variable Coefficients To find the particular integral – Equations reducible to linear homogeneous equation – method of variation of parameters. (Chapter 2: Sections 8 to 10)	12
III	Partial Differential Equations Formation of equations by elimination of constants and arbitrary functions – General, particular, complete and singular integral (Geometrical meaning not expected) – Solutions of first order equations of the standard forms. (Chapter 4: Sections 1 to 4 and 5.1- 5.4)	12

IV	<p>Partial Differential Equations</p> <p>Equations reducible to the standard forms- Lagrange's equation – Charpit's method.</p> <p>(Chapter 4: Sections 5.5, 6, 7)</p>	12
V	<p>Laplace Transforms</p> <p>Standard formulae – Some general Theorems (statement only) and Simple Applications – Inverse Laplace transforms (problems only) – Application to the solution of Second order ordinary differential equations with constant coefficients.</p> <p>(Chapter 5 : Sections: 1 - 8)</p>	12
VI	<p>Simultaneous differential equations: Simultaneous equations of the first order and first degree-Solutions of $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ – Methods for solving $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ – Geometrical interpretation of $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$. Simultaneous linear differential equations with constant co-efficients-Total differential equations.</p> <p>(Chapter 3: Sections: 1-7)</p>	-

Text Books:

T.K. Manickavasagam Pillai and S. Narayanan , Calculus Vol III, S.Viswanathan Printers and Publishers Pvt. Ltd., Chennai, Reprint 2012.

Reference Books:

1. M.L.Khanna, Differential Equations, Jai Prakash Nath & Co, Meerut City, 1984.
2. M.K.Venkatraman, Engineering Mathematics, The National Publishing Co, Madras, 1984

Web – Resources:

1. https://www.sakshieducation.com/Engg/EnggAcademia/CommonSubjects/MathMethods-Fourier_Series.pdf
2. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwi7woqJ99ryAhVSmuYKHV6WAvEQFnoECAMQAO&url=http%3A%2F%2Fdsp-book.narod.ru%2FTA%2Fch05.pdf&usg=AOvVaw3JM2twdl0pr0iLA57YSwoe>

Course Outcomes

On Completion of the Course, Students should be able to

- CO1 : Solve the higher order linear differential equations with constant coefficients.
CO2 : Solve differential equations by using method of variation of parameters
CO3 : Find solutions of first order partial differential equations of the standard forms
CO4 : Solve the PDE's using Charpit's method.
CO5 : Apply the techniques of Laplace transform and inverse Laplace transform

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	M	M	S	S	M	S	S	S
CO2	S	S	M	M	S	S	M	S	S	S
CO3	S	S	M	M	S	S	M	S	S	S
CO4	S	S	M	M	M	S	S	S	S	M
CO5	S	S	M	M	S	S	M	M	S	S

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-III/ Core Course-VI(CC)	VECTOR CALCULUS AND FOURIER SERIES	Course Code: MUF
Instruction Hours: 5	Credits: 5	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> To understand the fundamental concepts of vector differentiation. To develop the knowledge of vector integration.. To acquire the interpretation of curl of a vector field. To inculcate the basic concepts of Fourier series. To know about half range sine and cosine series 	
UNIT	CONTENT	HOURS
I	Vector differentiation: Velocity & acceleration – Level surfaces – The vector differential operator – Gradient of a vector – Direction and magnitude of gradient – Divergence & curl of a vector – Solenoidal & Irrotational vectors . – Formula involving operator ∇ – Operators involving ∇ twice and problems. (Chapter IV: Section 4 – 12)	15
II	Vector integration: Line integral – Conservative field – Volume integral – Surface integral(problems and theorem statement only). (Chapter VI: Section 2 – 5)	15
III	Application of vector integration: Gauss Divergence Theorem – Green’s theorem – Stoke’s Theorem (Statements Only) – Simple Problems. (Chapter VI: Section 6 – 10)	15
IV	Fourier series: Definition of Fourier series – Fourier series expansion of periodic functions with period 2π [$(0, 2\pi)$, $(0, 2l)$] (Chapter VI: Sections 1 and 2)	15

V	Even and odd functions: Definition of even and odd functions – Properties – Use of these functions in Fourier series – Half range Fourier series – Development in cosine series –Development in sine series. (Chapter VI: Section 3 – 5)	15
VI	Fourier Transforms: Complex Form of Fourier Integral Formula – Fourier Integral Theorem – Properties of Fourier transform – Fourier Cosine Transform – Fourier Sine Transform – Properties of F_c and F_s . (Chapter VI: Section 9 – 12)	-

Text Books:

1. T.K.Manickavasagam Pillai and S.Narayanan, Vector Algebra and Analysis, S.Viswanathan Printers and Publishers Pvt. Ltd.,Chennai, 1986.(For units I, II and III)
2. T.K. Manickavasagam Pillai and S. Narayanan, Calculus Volume III, S.Viswanathan Printers and Publishers Pvt.Ltd., Chennai, 2004. (For units IV&V and VI Self Learning)

Reference Books:

1. P. Duraipandiyan and Lakshmi Duraipandiyan, Vector Analysis, Emerald Publishers 1986.
2. R. Balaji, Transforms and Partial Differential Equations, G. Balaji Publishers, 2005.

Web – Resources:

1. https://www.sakshieducation.com/Engg/EnggAcademia/CommonSubjects/MathMethods-Fourier_Series.pdf
2. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjqsY2k9NzyAhXR4nMBHYVhBIUQFnoECAcQAQ&url=https%3A%2F%2Fwww.math.ust.hk%2F~machas%2Fvector-calculus-for-engineers.pdf&usg=AOvVaw3UmDgmJIo7nWOznTeyO7P>

Course Outcomes

On Completion of the Course, Students should be able to

- | | |
|-----|--|
| CO1 | : explain the concepts of differentiation of vector field. |
| CO2 | : integrate the vector functions over curves and surfaces. |
| CO3 | : compute integrals using Green's theorem, Stoke's theorem and the divergence theorem. |
| CO4 | : solve the wave equations, Laplace equations using Fourier series |
| CO5 | : derive the Fourier Series to the periodic signals in half range. |

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	M	W	S	S	M	S	S	S
CO2	S	S	M	W	S	S	M	S	S	S
CO3	S	S	M	W	S	S	S	S	S	M
CO4	S	S	M	W	S	S	M	M	S	S
CO5	S	S	M	W	S	S	S	M	S	S

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-III / NME I	MATHEMATICS FOR COMPETITIVE EXAMINATIONS I	Course Code:MUE1
Instruction Hours: 2	Credits: 2	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To study the problems on series. • To understand the coding and decoding. • To learn the problems relating blood relation. • To know about the mathematical puzzles. • To interpret the logics using venn diagram 	
UNIT	CONTENT	HOURS
I	Series Completion: Number Series - Alphabet Series. (P. No. 139 – 159)	6
II	Coding and Decoding: Letter Coding – Number Coding – Matrix Coding. (P. No. 169 – 192)	6
III	Blood Relation: Deciphering jumbled up descriptions – Relation Puzzle – Coded Relations. (P.No. 220 – 241)	6
IV	Puzzle Test: Seating / Placing arrangements – Comparison Test. (P.No. 253 – 278)	6
V	Venn Diagram Direction Sense Test – Logical Venn Diagram. (P.No. 324 – 333, 348 – 366).	6

Text Book:

R.S. Agarwal, A modern approach to Verbal and Non-Verbal Reasoning, S.Chand & Company Ltd, New Delhi- 55.

Reference Books:

1. [Dinesh Khattar](#), The Pearson Guide to Quantitative Aptitude for Competitive Examinations, Pearson Publications, 2014.
2. Arun Sharma, Teach Yourself Quantitative Aptitude, Mc GrawHill Education, 2017.

Web - Resources:

1. <https://www.spleasons.com/lesson/profit-loss-problems/>
2. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiQ7pHb9tzyAhWp7HMBHcEbBcEQFnoECAMQAAQ&url=https%3A%2F%2Fgradeup.co%2Fquantitative-aptitude-practice-questions-answers-pdf-i&usg=AOvVaw11iv2GCS3pvGLz9i2Nd48L>

Course Outcomes

On Completion of the Course, Students should be able to

- | |
|---|
| CO1: solve the problems on series.
CO2: write the coding and decoding.
CO3: evaluate problems on blood relation
CO4: solve mathematical puzzles
CO5: compute problems using venn diagram. |
|---|

Semester-IV / Core Course-VII (CC)	SEQUENCES AND SERIES	Course Code: MUG
Instruction Hours: 4	Credits: 4	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K 1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> To lay a good foundation for sequences. To study the behavior of monotonic sequences. To know the concepts of subsequences and Cauchy sequences. To find the convergence of series using different tests. To learn about the alternating series and absolute convergence 	
UNIT	CONTENT	HOURS
I	Sequences Sequences– Bounded Sequences– Monotonic Sequences– Convergent Sequences–Divergent and Oscillating sequences.(Chapter3:Sec.3.0–3.5)	12
II	Monotonic Sequences Algebra of Limits–Behavior of Monotonic Sequences. (Chapter3:Sec.3.6& 3.7)	12
III	Subsequences Some theorems on limits–Subsequences–Limit points– Cauchy sequences. (Chapter3:Sec.3.8-3.11)	12
IV	Series: Infinite series – Cauchy’s general principle of Convergence – Comparison test.(comparison test statement only, no proof). (Chapter4:Sec.4.1&4.2)	12
V	Tests of convergence: DAlembert’s Ratio test–Cauchy’s root test– Alternating Series–	12

	Absolute Convergence (Statements only for all tests). (Chapter 4: Sec Relevant part of 4.3 and 4.4, Chapter 5: Sec 5.1 & 5.2)	
VI	Infinite Series : Higher Ratio Tests – Raabe’s Test – Kummer’s Test – Logarithmic Ratio Test – Gauss’s Test (Chapter 4- Sec 7 & 9)	-

Text Books:

1. Dr.S.Arumugam & Mr.A.Thangapandi Isaac Sequences and Series, New Gamma Publishing House, 2002.
2. S L Gupta, Nisha Rani, Fundamental Real Analysis, (4th edition) Vikas Publishing House Pvt. Ltd., **(VI Self Learning)**

Reference Books:

1. T.K.Manickavasagam Pillai, T. Natarajan and K.S. Ganapathy, Algebra Vol I, S.Viswanathan Printers & Publishers Pvt. Ltd., Chennai, 2018.
2. M.K. Singal and Asha Rani Singal, A first course in Real Analysis , 20th edition , R. Chand and Co., New Delhi.

Web – Resources:

1. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwim0c-YktjyAhXygtgFHQWjDbUQFnoECAMQAAQ&url=http%3A%2F%2Fwww.stet.edu.in%2FSSR_Report%2FStudy%2520Material%2FPDF%2FMATHS%2FUG%2FII%2520Year%2F1.pdf&usg=AOvVaw2qrx17JQoDI4_E8hFnAV1w
2. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwibxY9zyAhUTlbcAHXdWCQ8QFnoECCUQAQ&url=https%3A%2F%2Fpeople.math.osu.edu%2Ffowler.291%2Fsequences-and-series.pdf&usg=AOvVaw3b6gLzhe84ycqzcCJCSqB5>

Course Outcomes

On Completion of the Course, Students should be able to

CO1 : find the convergence of sequences

CO2 : evaluate the limits and describe the behavior of monotonic sequences

CO3 : interpret the concepts of subsequences and Cauchy sequences.

CO4 : discuss the convergence or divergence of series using various tests

CO5 : compute the absolute convergence of series.

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	M	M	W	S	S	M	S	S	S
CO2	S	S	M	W	S	S	M	S	S	S
CO3	S	S	M	W	S	S	M	S	S	S
CO4	S	S	M	W	S	S	M	S	S	M
CO5	S	S	M	W	S	S	M	S	S	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-IV / NME -II	MATHEMATICS FOR COMPETITIVE EXAMINATIONS II	Course Code: MUE2
Instruction Hours: 2	Credits: 2	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives:	<ul style="list-style-type: none"> • To learn the problems solving techniques for numbers. • To study the operations on numbers. • To develop arithmetical skills. • To know about puzzles. • To enhance the facts of logical reasoning 	
UNIT	CONTENT	HOURS
I	Number, Ranking and Time Series Test Number Test – Ranking Test – Time sequence Test. (P. No. 417 – 432)	6
II	Mathematical Operations: Problem Solving by Substitution – Interchange of signs and numbers – Deriving the appropriate conclusion. (P. No. 432 – 454)	6
III	Arithmetical Reasoning Calculation based Problem – Data based question – Problem on ages – Venn diagram based questions. (P. No. 459 – 474)	6
IV	Missing Characters Inserting the Missing character. (P. No. 475 – 492)	6

V	Logical Reasoning Data sufficiency – Logical Sequence of Words – Logical Reasoning. (P. No. 495 – 506, 455 – 458, Part II 1 - 14)	6
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Text Book:

R.S. Agarwal, A Modern Approach to Verbal and Non-Verbal Reasoning, S. Chand & Company Ltd, New Delhi- 55.

Reference Books:

1. [Dinesh Khattar](#), The Pearson Guide to Quantitative Aptitude for Competitive Examinations, Pearson Publications, 2014.
2. Arun Sharma, Teach Yourself Quantitative Aptitude, Mc GrawHill Education, 2017.

Web- Resources:

1. <https://www.spllessons.com/lesson/profit-loss-problems/>
2. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiQ7pHb9tzyAhWp7HMBHcEbBcEQFnoECAMQAAQ&url=https%3A%2F%2Fgradeup.co%2Fquantitative-aptitude-practice-questions-answers-pdf-i&usg=AOvVaw11iv2GCS3pvGLz9i2Nd48L>

Course Outcomes:

On completion of the course the learner will be able to

CO1: develop quantitative ability. CO2: apply mathematical operations. CO3: decipher arithmetical reasoning CO4: solve logical reasoning. CO5: crack competitive examinations.
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Semester-IV / SBE I	STATISTICAL PROGRAMMING USING COMPUTATIONAL PACKAGES	Course Code: MUS1
Instruction Hours: 2	Credits: 2	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Course Objectives:

- To know the computational methods for solving mathematical problems.
- To understand the computational methods for drawing simple and multiple bar diagrams.
- To learn the computational methods on histogram concepts.
- To study the computational methods on correlation and regression.
- To interpret the computational methods on t-test and goodness of fit

List of Practicals:

1. Mean, Median and Mode.
2. Standard Deviation
3. Simple Bar Diagram
4. Multiple Bar Diagram.
5. Pie Diagram.
6. Histogram.
7. Correlation.
8. Regression.
9. Paired t – test for Means.
10. Chi – Square test for Goodness of fit.

Text Book:

1. P. Chandran, A. Rajathi, SPSS For U, MJP Publishers, 2010.

Reference Books:

1. Kiran Pandya, Addison-Wesley, Dreamtech Press, 2011.
2. K. V. S. Sharma, Statistics Made Simple: Do it Yourself on PC, Prentice Hall India Learning Private Limited, 2010.

Web- Resources:

- https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwizkauQg93yAhXEjOYKHedoBKYQFnoECAYQAAQ&url=http%3A%2F%2Fwww.academia.dk%2FBiologiskAntropologi%2FEpidemiologi%2FPDF%2FSPSS_Statistical_Analyses_using_SPSS.pdf&usg=AOvVaw18WQeOj5jEKncZ9x89ryZ1
- https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiR4f_0g93yAhXh4nMBHVmvB-0QFnoECCQQAQ&url=http%3A%2F%2Fwww.hstathome.com%2Ftjziyuan%2FSPSS%2520for%2520beginner%2520428pages.pdf&usg=AOvVaw0LtoFtB-B_0-6BFOp-43Bp

Course Outcomes:

On completion of the course the learner will be able to

CO 1: Use the computational methods for solving mean, median, mode and standard deviation.

CO 2: Draw simple and multiple bar diagrams.

CO 3: Apply the computational methods on histogram concepts.

CO 4: Compute correlation and regression.

CO 5: Evaluate t-test and goodness of fit.

Semester-IV / Core Course-VIII (CC)	NUMBER THEORY	Course Code: MUH
Instruction Hours: 4	Credits: 4	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K 1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To introduce the concepts of divisibility, prime number and prime-factorization. • To learn about Euler Function, Greatest integer function and Mobius function. • To know the conjectures in number theory. • To acquire the knowledge of linear congruences. • To study the methods of classifying numbers 	
UNIT	CONTENT	HOURS
I	Prime and Composite Numbers Coprimes-Sieve of Eratosthenes-Euclid's Theorem- Unique factorization-Fundamental Theorem of Arithmetic-Positional Representation of Integers-Number of Divisors-Sum of Divisors-Symbols $d(n), \sigma(n)$ -Arithmetic functions. (Chapter IV : Sec 77 to 97)	12
II	Prime and Composite Numbers Perfect Numbers- Euclid's Theorem on Perfect Numbers-Amicable Numbers-Euler's Function $\Phi(n)$ - Greatest integer function-Mobius function $\mu(n)$ -Inversion formula and its converse. (Chapter IV: Sec 98 to 128)	12
III	Distribution of Primes General Discussion – Fermat's Conjecture-Fermat Numbers-Gold Bach' S Conjecture- Mersenne Numbers –Gap Theorem – Infinitude of Primes. (Chapter V)	12

IV	<p>Congruences</p> <p>Definition – Residue Classes - Complete and Least Residue Systems-Reduced Residue Systems – Casting out 9 – Magic Numbers- Divisibility Tests - Linear Congruences - Solution of Congruences - Chinese Remainder Theorem. (Chapter VI)</p>	12
V	<p>Quadratic Reciprocity</p> <p>Quadratic Residues and Non Residues –Euler Criterion – Primitive Roots is a Quadratic Non Residue –Legendre symbol –Gauss lemma –Quadratic Reciprocity Law. (Chapter X: Sec 255 to 278)</p>	12
VI	<p>Quadratic Reciprocity:</p> <p>Application of quadratic reciprocity law – primes for which a given integer is a quadratic residue – Jacobi’s symbol – quadratic congruences prime power moduli and composite moduli- number of solutions of quadratic congruences. (Chapter X: Sec. 279 – 303)</p>	-

Text Books:

Prof. S.Kumaravelu and SusheelaKumaravelu, Elements of Number Theory, Raja Sankar off set Printers, Sivakasi,2002.

Reference Books:

1. David M. Burton, Elementary Number Theory , W.M.C. Brown Publishers, Dubuque, Iowa, 1989.
2. George E. Andrews, Number Theory, Hindhustan Publishing Corporation, 1984.

Web – Resources:

1. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiWwpfAitjAhXo_3MBHSUACxMQFnoECAIQAAQ&url=https%3A%2F%2Fwww.maths.ed.ac.uk%2F~v1ranick%2Fpapers%2Fborevich.pdf&usg=AOvVaw372Va5g3fXMVkCKzIBH_dW
2. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiKvO6K_NzyAhVk7HMBHXIADM8QFnoECAgQAQ&url=http%3A%2F%2Fwww.maths.gla.ac.uk%2F~ajb%2Fdvi-ps%2F3q-notes.pdf&usg=AOvVaw0811YhiBQ4RbMdPWRioKyt

Course Outcomes:

On completion of the course the learner will be able to

- CO1 : find the divisor, sum and product of a given natural number
- CO2 : gain the knowledge of number theoretic functions
- CO3 : interpret the famous conjectures in number theory
- CO4 : solve the system of linear congruences using the chinese remainder theorem.
- CO5 : apply the law of quadratic reciprocity to classify numbers as quadratic residues and quadratic non-residues

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	M	W	S	S	M	S	S	S
CO2	S	S	M	W	S	S	M	M	S	S
CO3	S	S	M	W	S	S	M	S	S	S
CO4	S	S	S	W	S	S	S	S	S	S
CO5	S	S	S	W	S	S	S	S	S	S

S - Strongly Correlated
M - Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-V / Core Course-IX (CC)	ALGEBRA	Course Code: MUI
Instruction Hours: 6	Credits: 6	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K 1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To acquire the knowledge of basic abstract system of mathematics. • To understand the concepts of subgroups, normal subgroups, isomorphism and homomorphism. • To study the algebraic systems with two binary operations and properties of rings up to isomorphism. • To learn the concepts of vector spaces, subspaces and linear independence. • To explore the concepts of basis and dimension, matrix of a linear transformation and the inner product space. 	
UNIT	CONTENT	HOURS
I	Groups Introduction –Definitions and Examples – Subgroups – Cyclic groups – Order of an element – Cosets and Lagrange’s Theorem . (Sections 3.1, 3.5 to 3.8)	18
II	Groups Normal subgroups and quotient groups – Finite groups and Cayley’s theorem – isomorphism and homomorphism. (Sections 3.9 to 3.11).	18
III	Rings Definition and examples – Elementary properties of rings –Types of rings – Characteristics of rings – Subrings – Ideals – Quotient rings – Homomorphism of rings. (Sections 4.1 to 4.8 & 4.10).	18
IV	Vector spaces Introduction –Definition and examples – Subspaces – Linear transformation- Span of a set – Linear independence.	18

	(Sections 5.1 to 5.5)	
V	Vector spaces and Inner Product Space Basis and dimension – Rank and Nullity – Matrix of a linear transformation – Inner product space. (Sections 5.6 to 5.8 & Chapter 6)	18
VI	Bilinear forms: Introduction – Bilinear forms-quadratic forms. Lattices: Introduction-Partially ordered sets-Lattices-Distributive Lattices-Modular Lattices-Boolean Algebras. Chapter 8: Sec. 8.0-8.2 and Chapter 9:Sec. 9.0 – 9.5	-

Text Books:

Modern Algebra by S. Arumugam and A. Thangapandi Isaac., New Gamma Publishing House, Revised Edition, Palayamkottai, 2003.

Reference Books:

1. R. Balakrishnan & N. Ramapathran, Modern Algebra, Vikas publishing House Pvt Ltd, New Delhi, 1982.
2. S. G. Venkatachalapathy, Modern Algebra, Margham Publications, 2016.

Web – Resources:

1. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUK Ewjsv-St NfyAhVlzTgGHVh4CPAQFnoECAQQAQ&url=https%3A%2F%2Fmathcs.clarku.edu%2F~djoyce%2Fma225%2Falgebra.pdf&usg=AOvVaw1U-vMmDOAnPKn3xikKHJ5>
2. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwi1wdHugN3yAhVAzzgGHZjqDLsQFnoECAMQAQ&url=http%3A%2F%2Fusers.metu.edu.tr%2Fserge%2Fcourses%2F116-2015%2FTextbook116.pdf&usg=AOvVaw1L8OuhRUPC1inu8zQWWh1M>

Course Outcomes:

On completion of the course the learner will be able to

- | | |
|-----|--|
| CO1 | :Gain the knowledge of sets, mapping, relations, groups and subgroups. |
| CO2 | : Interpret the notion of normal groups and isomorphism. |
| CO3 | :Analyze the concepts of homomorphism and isomorphism for rings and field. |
| CO4 | :Recognize the facts of vector space and linear independence. |
| CO5 | :Calculate the basis, dimension, matrix of the linear transformation and inner product space |

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	M	S	M	S	M	M	S	S	S
CO2	S	S	M	M	S	M	M	M	S	M
CO3	S	S	M	M	S	M	M	S	S	M
CO4	S	S	S	M	S	S	M	S	S	M
CO5	S	S	S	S	S	S	M	S	S	S

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester- V / Core Course-X (CC)	REAL ANALYSIS	Course Code: MUJ
Instruction Hours: 6	Credits: 5	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To lay a good foundation for real analysis. • To explore the concepts of continuity and discontinuity. • To understand the derivability and its related parameters. • To learn mean value theorems and Taylor's series. • To gain the knowledge of Riemann integration 	
UNIT	CONTENT	HOURS
I	Real numbers Absolute value – Completeness –Some important subsets of \mathbb{R} – Representation of real numbers as a point on a straight line –Intervals – Countable and Uncountable sets. (Chapter 1: Sec 5-10)	18
II	Limits and Continuity Continuous functions – Types of discontinuities – Algebra of Continuous functions – Boundedness of Continuous Functions –Intermediate value Theorem – Inverse function theorem –Uniform continuity of a function. (Chapter 5: Section: 2-8)	18
III	Derivatives Introduction –Derivability and continuity – Algebra of derivatives – Inverse function theorem for derivatives – Darboux's theorem –Inverse Trigonometric Functions –Derivatives of Inverse Trigonometric Functions. (Chapter 6 : Sec 1-7)	18

IV	Mean Value Theorems Rolle's Theorem – Lagrange's Mean value theorem–Cauchy's Mean Value Theorem -Taylor's theorem –Taylor Series –Power Series expansions of some standard functions. (Chapter 8: Sec 1-6)	18
V	Riemann integration Definition – Riemann Integrability and integral of a bounded functions over finite domain -Darboux's theorem –Another equivalent definition of Integrability and Integral -Conditions of Integrability –Particular classes of bounded integrable functions – Properties of Integrable functions – Functions defined by definite integrals –Mean Value Theorem of integral calculus –Change of variable in an integral –Integration by (Chapter 6: 6.1-6.11)	18
VI	Mean Value Theorems: Monotone Functions – Inequalities. Maxima & Minima: Introduction – Conditions for the Existence of Extreme Values. Chapter 8 : Sec. 7 & 8 ; Chapter 9 : Sec. 1 & 2	-

Text Books:

1. M.K. Singal and AshaRaniSingal, A first course in Real Analysis , 34th edition , R. Chand and Co., New Delhi, 2020. (For units I to IV) .
2. Shanthi Narayan, A Course of Mathematical Analysis, S. Chand and Co., New Delhi,1962. (For Unit V).

Reference Books:

1. Walter Rudin, Principles of Mathematical Analysis, Third edition, McGraw-Hill International Company, New York, 1984.
2. Robert G. Bartle, Donald R. Sherbert, Introduction to Real Analysis, Third Edition, ShriBalaji Art, Delhi.

Web – Resources:

1. <http://library.lol/main/89E381DC3B8895ECC7A1F2AD7032E9E8>
2. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjDI5mLiN3vAhUX9nMBHYIiBscQFnoECAMQAQ&url=https%3A%2F%2Fsolution.files.wordpress.com%2F2015%2F07%2Fkumar-ajit-kumaresan-s-a-basic-course-in-real-analysis-taylor-francis-2014.pdf&usq=AOvVaw1UUF1b8TaMG37BMeMxq7AW>

Course Outcomes:

On completion of the course the learner will be able to

- CO1 : Apply the order completeness property.
- CO2 : Differentiate the continuity and discontinuity of functions.
- CO3 : Find the derivative of a given function.
- CO4 : Demonstrate the mean value theorems.
- CO5 : Interpret the integrability of functions

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	S	W	M	S	S	S	S	M
CO2	S	S	S	W	M	S	S	S	S	M
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	W	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester - V / Core Course - XI (CC)	MECHANICS	Course Code: MUK
Instruction Hours: 6	Credits: 5	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K 1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To provide the basic knowledge about Equilibrium of a particle and rigid bodies. • To learn the effect of Hanging strings and Suspension bridge. • To study the simple harmonic motions and projectiles. • To know the concepts of Impact and Impulsive force. • To handle practical problems in central objects and basics of moment of inertia. 	
UNIT	CONTENT	HOURS
I	Equilibrium of A Particle And Forces On A Rigid Body Equilibrium of a Particle – Triangle of Forces – Lami’s Theorem – Moment of a Force – General Motion of a Rigid Body – Parallel Forces – Varignon’s Theorem – Forces along the sides of a triangle - Couples. (Chapter 3: Section 3.1, Chapter 4: Sections 4.1, 4.2, 4.4, 4.5, 4.6)	18
II	Hanging strings Equilibrium of a uniform homogeneous strings – Suspension bridge – Simple Problems. (Chapter 9: Sections 9.1 & 9.2)	18
III	Rectilinear motions under varying force and Projectiles Simple Harmonic Motion –S.H.M along a horizontal line – S.H.M. along a vertical line — Forces on a Projectile –Projectile projected on an inclined plane – enveloping Parabola or bounding parabola. (Chapter 12: sections 12.1 to 12.3 & 13.1 to 13.3)	18
IV	Impact Impulsive force – Impact of Spheres – Impact of two smooth spheres - Impact of a smooth sphere on a plane – Oblique impact of two smooth	18

	spheres.(Chapter 14: Sections 14.1 to 14.5)	
V	Central Orbits and Moment of Inertia General orbits – Central orbit – Conic as a centered orbit - Moment of Inertia – Perpendicular and Parallel axes theorems. (Chapter 16: Sections 16.1- 16.3 & Chapter 17: 17.1)	18
VI	Virtual Work: Principles of Virtual Work. Chapter 8 Work, Energy & Power: Units of Work – Workdone in stretching an elastic string – conservative field of Force : Energy – Conservation of Energy – Power. Chapter 11	-

Text Books:

P.Duraipandian, LaxmiDuraipandian and MuthamizhJayapragasam, Mechanics S. Chand and Company, New Delhi, 2007.

Reference Books:

1. M.K. Venkatraman, Dynamics, Agasthiyar Publications, 11th Edition, 2004.
2. M.K. Venkatraman, Statics, A. Rajhan's Publications, 16th Edition, 1990.

Web – Resources:

1. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewikiOCDgdjvAhVz7HMBHaO9AmQQFnoECA0QAQ&url=http%3A%2F%2FRuina.tam.cornell.edu%2FBook%2FRuinaPratap8-21-10.pdf&usq=AOvVaw3daJpt3IvSMrvvaTfdhF-Y>
2. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjruLGqid3vAhXL8HMBHcJdB1gQFnoECAMQAQ&url=https%3A%2F%2Fbrown.edu%2FDepartments%2FEngineering%2FCourses%2FEn4%2FNotes%2FJF_Rigid_Body_Lectures%2FLecture3_Jen_RigidBodies.pdf&usq=AOvVaw1cD-uc8CViO_IBH1jT3Ubx

Course Outcomes:

On completion of the course the learner will be able to

- | | |
|-----|---|
| CO1 | : Understand the equilibrium of a particle in statics and dynamics. |
| CO2 | : Demonstrate the clear concept of Hanging strings and suspension bridge. |
| CO3 | : Learn the concepts of rectilinear motion, simple harmonic motion and projectile |
| CO4 | : Clarify the Impact of spheres and Impulsive forces. |
| CO5 | : Exhibit the concepts on Central Orbit and Moment of Inertia. |

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	M	W	S	M	M	S	S	S
CO2	S	S	M	W	S	S	M	S	S	M
CO3	S	S	S	W	S	S	S	S	S	S
CO4	S	S	M	W	S	S	M	S	S	W
CO5	S	S	M	W	S	S	M	S	S	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-V / MBE I	OPERATIONS RESEARCH	Course Code:MUE3
Instruction Hours: 6	Credits: 5	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K 1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 – Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To find the solution of the LPP using graphical method • To understand different types of LPP • To solve Transportation Problem using various methods • To introduce Assignment Problem and solve it • To explore the concepts of Network Analysis and rules of network construction 	
UNIT	CONTENT	HOURS
I	Linear Programming Problem(Mathematical Formulation): Mathematical Formulation of L.P.P – Graphical Solution – Introduction – Graphical Solution method – Some exceptional cases – General Linear Programming Problem – Canonical and Standard form of LPP – Simplex method – Introduction - The computational Procedure. (Excluding Theorems). (Chapter 2: Sections 2.1 , 2.2, 3.1 to 3.5, 4.1-4.3)	18
II	Linear Programming Problem(Simplex Method): Use of Artificial Variables – Two – Phase Method – Duality in Linear Programming problem – Introduction – General primal- Dual Pair– Formulating a dual Problem – Duality and Simplex Method– Dual Simple	18

	Method.(Excluding Theorems). (Chapter 4: Section: 4.4 and Chapter 5: Section 5.1 - 5.3, 5.7, 5.9)	
III	Transportation Problem: Introduction– LP Formulation of the Trnsportation problem –Existence of solution in TP –Duality in Transportation problem –The Transportation Table –Loops in Transportation Tables –Triangular basis in TP –Solution of a Transportation problem –Finding an Initial Basic feasible Solution – Test for Optimality – Transportation Algorithm (MODI Method). (Chapter 10: Section 10.1-10.10& 10.13)	18
IV	Assignment problem: Introduction –Mathematical formulation of the problem – Solution methods of Assignment algorithm – The Travelling Salesman Problem. (Chapter 11: Section 11.1 - 11.3 & 11.7)	18
V	Network Scheduling by PERT/ CPM: Introduction– Network and Basic Components – Logical Sequencing –Rule of Network Construction – Concurrent Activities – Critical Path Analysis – Probability considerations in PERT –Distinction between PERT and CPM –Applications of Network Techniques. (Chapter 25: Section 25.1 - 25.9)	18

Text Book:

Kanti Swarup, P.K. Gupta and Man Mohan, Operations Research, Sultan Chand and Sons , Educational Publishers, New Delhi, 2014

Reference Books:

1. V. Sundaresan, K. Ganesan, Resource Management Techniques, A.R. Publications, 2002 .
2. J.K.Sharma, Operations Research Theory and Applications, Macmillan India Ltd, 3rd edition, 2006.

Web- Resources:

- https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwji3JTxfvAhWS8XMBHSA4C40QFnoECAsQAQ&url=http%3A%2F%2Fwww.ru.ac.bd%2Fstat%2Fwp-content%2Fuploads%2Fsites%2F25%2F2019%2F03%2F405_01_Srinivasan_Operations-Research_-_Principles-and-Applications-Prentice-Hall-of-India-2010.pdf&usg=AOvVaw2dnrAYWf2nwV5_kL0Q5V9
- <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwihrbini93yAhXe4nMBHRw4DwIQFnoECAoQAQ&url=https%3A%2F%2Fprolightinggroup.com%2Fwp-content%2Fuploads%2F2020%2F08%2FOperations-Research-and-Management-Science-Handbook.pdf&usg=AOvVaw2uoiENWckpg0CjXMtRe5Jk>

Course Outcomes:

On completion of the course the learner will be able to

CO1	: Analyze and solve linear programming models of real life situations
CO2	: Understand the problem solving method of Simplex and Big M Method.
CO3	: Exhibit the applications of Transportation Problem.
CO4	: Solve Assignment problems.
CO5	: Use PERT and CPM techniques in solving Network Analysis problems

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	M	M	S	M	M	S	S	S
CO2	S	S	M	M	S	S	M	S	S	M
CO3	S	S	S	M	S	S	S	S	S	S
CO4	S	S	M	M	S	S	M	S	S	M
CO5	S	S	M	M	S	S	M	S	S	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-V / SBE-II	QUANTITATIVE APTITUDE	Course Code: MUS 2
Instruction Hours: 2	Credits: 2	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K 1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To learn puzzles. • To know the time series problems. • To study the arithmetical reasoning problems. • To identify the missing characters. • To get the logical ability. 	
UNIT	CONTENT	HOURS
I	Problems on puzzles : Blood Relation - Puzzle Test (P. No. 220 – 241, 253 – 278)	6
II	Mathematical Operations: Number, Ranking and Time Series Test - Mathematical Operations. (P. No. 417 – 432, 432 – 454)	6
III	Problems on reasoning: Arithmetical Reasoning (P. No. 459 – 474)	6
IV	Puzzles on missing character: Inserting the Missing character. (P. No. 475 – 492)	6
V	Logical Reasoning: Data sufficiency – Logical Sequence of Words. (P. No. 495 – 506, 455 – 45)	6

Text Book:

R.S.Agarwal, “A modern approach to Verbal and Non-verbal Reasoning” , S.Chand & Company Ltd, Delhi.

Reference Books:

1. Arun Sharma, Teach Yourself Quantitative Aptitude, Mc GrawHill Education, 2017.
2. [Dinesh Khattar](#), The Pearson Guide to Quantitative Aptitude for Competitive Examinations, Pearson Publications, 2014.

Web- Resources:

<https://www.spllessons.com/lesson/profit-loss-problems/>

<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiQ7pHb9tzyAhWp7HMBHcEbBcEQFnoECAMQAAQ&url=https%3A%2F%2Fgradeup.co%2Fquantitative-aptitude-practice-questions-answers-pdf-i&usg=AOvVaw11iv2GCS3pvGLz9i2Nd48L>

Course Outcomes:

On completion of the course the learner will be able to

- | |
|---|
| <p>CO 1: Solve all types of puzzles.</p> <p>CO 2: Calculate the time series.</p> <p>CO 3: Discuss the arithmetical reasoning problems.</p> <p>CO 4: Find the missing characters.</p> <p>CO 5: Interpret the logical ability problems.</p> |
|---|

Semester-V / SBE-III	DOCUMENT PREPARATION SYSTEM USING LATEX	Course Code: MUS3
Instruction Hours: 2	Credits: 2	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K 1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To introduce the fundamentals of Latex. • To know the symbols and arrays in Latex. • To study the commands and floating body in Latex. • To know the of table of contents, sections and paragraphs. • To understand the page breaking, numbering and listing environment 	
UNIT	CONTENT	HOURS
I	Introduction: Preparing Inputs – Sentences and Paragraphs (Quotation mark, dashes, Space after a period, Special Symbols and Simple text Generating Commands).	6
II	Sectioning the document: Document classes – Sectioning – Changing the text style – Accents, Symbols – Mathematical Formulas and Symbols – Arrays – Delimiters and Multiline Formulas.	6
III	Commands and Floating Bodies: Defining commands and environments – Figures and Floating Bodies – marginal Notes – Lining up in Columns.	6

IV	Table of contents and Citations: Creating Table of Contents – Cross References – Bibliography and Citations – Splitting Your Input – Making Index and Glossary – Keyboard Input and Screen Output.	6
V	Page break and numbering: Slides and Overlays – Notes – Printing only some slides and Notes – Letters – Lining and Page Breaking – Numbering – Length, spaces and boxes – List making Environments.	6

Text Book:

A Document Preparation System Latex, By Leslie Lamport, Addison-Wesley Publications, 1994.

Reference Books:

1. Stefan Kottwitz, Latex Beginner's Guide: Create high-quality, professional-looking documents and books for business and science using LaTeX, Packt Publishing, 2011.
2. S. Swapna Kumar, LATEX - A Beginner Guide to Professional Documentation, Laxmi Publications Pvt Ltd, 2020.

Web- Resources:

- <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjRoMX0pNjyAhUp8HMBHZgDC5UQFnoECAIQAAQ&url=http%3A%2F%2Fwww.docs.is.ed.ac.uk%2Fskills%2Fdocuments%2F3722%2F3722-2014.pdf&usg=AOvVaw1rdgIk6SR2IqqtgFZ5xOIq>
- <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwilt4mQveTyAhXQcn0KHRAmD48QFnoECAMQAAQ&url=https%3A%2F%2Frkdf.ac.in%2FEResources%2F2.%2520Introduction%2520to%2520LaTeX.pdf&usg=AOvVaw1TISC8kRn7MZmBfFhYooxA>

Experiment:

1. Creating a document.
2. Creating table of contents in a document.
3. Numbering and alignment of a document.
4. Writing mathematical equations.
5. Inserting footnotes, header and footer.
6. Creating matrices.
7. Creating tables.
8. Drawing graphs.
9. Inserting diagrams, pictures and graphs.
10. Creating bibliography.

Course Outcomes:

On completion of the course the learner will be able to

- | |
|---|
| <p>CO 1: Interpret the fundamentals of Latex.</p> <p>CO 2: Apply the symbols and arrays in Latex.</p> <p>CO 3: Compile the commands and floating body in Latex.</p> <p>CO 4: Write table of contents, sections and paragraphs.</p> <p>CO 5: Put page break, number the contents and list the environment.</p> |
|---|

Semester-V / SBE-III	Soft Skill Development	Course Code: SSD
Instruction Hours: 2	Credits: 2	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K1 -Acquire / Remember K2 -Understand K3 -Apply K4 -Analyze K5 -Evaluate K6 -Create	
Course Objectives	<ul style="list-style-type: none"> • To learn the students the importance of Know Thyself / Understanding Self • To impart knowledge about the self development through inter personal relation. • To understand the importance of Communication. • To understand the role of Corporate Skills. • To make the students to understand the Selling Self\ Job Hunting 	
UNIT	CONTENT	HOURS
I	Know Thyself / Understanding Self Introduction to Self Skills – Self discovery – Developing positive attitude - Improving perception – Forming values.	6
II	Interpersonal Skills \ Working with Others Developing interpersonal relationship – Team building – group dynamics - Net working – improving work relationship.	6
III	Communication Skills \ Working with Others Art of listening – Art of reading – Art of Speaking – Art of Writing – Art of Writing E – mails –E mail etiquette.	6
IV	Corporate Skills \ Working with Others Developing body language – Practicing etiquette and mannerism – Time Management – Stress Management.	6
V	Selling Self\ Job Hunting Writing resume\cv – interview skills – discussed – Mock interview – Mock GD – Goal setting – Career planning.	6

Text Book:

1. Dr.K.Meena & Dr.V.Ayothi - A book on development of Soft Skills.
2. Dr.K.Alex - Soft Skills. S.Chand & Company Ltd. Ram Nagar, New Delhi -110055

Reference Books:

1. Developing the leader within you John C Maxwell
2. Good to Great by Jim Collins
3. The seven habits of highly effective people Stephen Covey
4. Emotional Intelligence Daniel Goleman
5. You can win Shive Khera
6. Principal centred leadership Stephen

Web Resources:

1. http://www.yahoo.com/social_science/economics/infoseek-economics
2. www.sciencedirect.com ; <http://Levine.ssnet.ucla.edu>

Course Outcomes:

On completion of the course the learner will be able

CO 1: Understand the importance of Know Thyself / Understanding Self

CO 2: Understand the importance of Self development through inter personal relation

CO 3: Analyse the importance of Communication.

CO 4: Understand the role of Corporate Skills

CO 5: Understand the Selling Self /Job Hunting Explain what Macro Economics is and why it is important

Semester-VI / Core Course XII CC	COMPLEX ANALYSIS	Course Code: MUL
Instruction Hours: 6	Credits: 6	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To lay a good foundation for complex analysis. • To acquire the knowledge in elementary and bilinear transformations. • To explore the ideas of complex integration. • To understand the expansions of series. • To find the residues using poles. 	
UNIT	CONTENT	HOURS
I	Analytic Functions Functions of complex variable – Limits –Theorems on limit – Continuous functions –Differentiability –The Cauchy-Riemann Equations – Analytic functions - Harmonic functions. (Chapter 2: Sections 2.1- 2.8).	18
II	Bilinear Transformations Elementary transformations – Bilinear transformations – Cross ratio – Fixed points of bilinear transformations. (Chapter 3: Section 3.1 - 3.4)	18
III	Complex Integration Definite integral – Cauchy’s theorem – Cauchy’s integral formula – Higher derivatives. (Chapter 6: Section 6.1 - 6.4)	18
IV	Series Expansions Taylor’s series – Laurent’s series – Zeros of an analytic function – Singularities. (Chapter 7: Section 7.1 - 7.4)	18

V	Calculus of Residues Residues – Cauchy’s Residue theorem – Evaluation of definite integrals. (Chapter 8: Sections 8.1 - 8.3)	18
VI	Elliptic Functions: Groups – Elliptic Functions – Weierstrass’s Elliptic Functions – The Addition Theorems – The Weierstrass’s Zeta Function – The Weierstrass’s Sigma Functions. Chapter 12	-

Text Books:

1. S.Arumugam, A.Thangapandi Issac, A.Somasundaram, Complex Analysis, Scitech Publications (India Pvt Ltd), Chennai, 2019.
2. B.Choudhary, The Elements of Complex Analysis, Wiley Eastern Limited , 1985. **(VI Self Learning)**

Reference Books:

1. P. Duraipandiyan, LaxmiDuraipandiyan, D. Muhilan, Complex Analysis, Emerald Publishers, Chennai, 1986.
2. T. K. Manikavachaagam Pillai, Complex Analysis, S. Viswanathan Printers and Publishers Pvt Ltd, 2009.

Web- Resources:

1. <http://library.lol/main/AF7B3A0C662BCFD4FC95BE5DF7B1278F>
2. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjRnJ65o93yAhUB4HMBHRVzBRwQFnoECAUQAQ&url=https%3A%2F%2Fwww.oulu.fi%2Fsites%2Fdefault%2Ffiles%2F151%2Fcomplex_book.pdf&usg=AOvVaw3YDQGdD5CeCnYEVbElwsgN

Course Outcomes:

On completion of the course the learner will be able to

CO1: Understand the basic concepts of Cauchy-Riemann equations in Cartesian and polar coordinates.
CO2: Interpret the analytic functions, harmonic functions, elementary and bilinear transformation concepts.
CO3: Apply the theorems using complex integration
CO4: Expand the Taylor’s and Laurent’s series of functions.
CO5: Solve the definite integrals using the concepts of residues

Mapping of Course outcomes with Programme Outcomes & Programme Specific Outcomes:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	M	M	S	S	M	M	S	M
CO2	S	S	M	M	M	S	M	S	S	M
CO3	S	S	M	W	S	S	M	S	S	S
CO4	S	S	M	W	M	S	M	S	S	S
CO5	S	S	S	W	M	S	S	S	S	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-VI / Core Course- XIII (CC)	NUMERICAL METHODS WITH C PROGRAMMING (THEORY)	Course Code: MUM
Instruction Hours: 5	Credits: 4	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K 1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To study the higher order linear differential equations with constant coefficients. • To find the solutions of linear differential equations with variable coefficients . • To acquire the knowledge of complete, singular and particular integrals of first order PDE. • To compute solutions of PDEs using Charpits method. • To gain the basic knowledge of Laplace transforms and its inverse with applications. 	
UNIT	CONTENT	HOURS
I	Structure of C: Overview of C - Constants, Variables and Data types-Operators and Expressions- Managing Input and Output operators.(Chapters: 1-4)	15
II	Decision making and Branching: Introduction –Decision making with IF statement –Simple IF statement –The IF ELSE statement –Nesting of IF ...ELSE statement –ELSE IF ladder –The switch statement –The ? Operator –GOTO statement-Decision making and looping - WHILE, DO, FOR statements-Arrays.(Chapters: 5-7)	15
III	Character Strings and Functions Handling of Character Strings –User defined functions. (Chapters: 8,9)	15
IV	Curve Fitting, The solution of Numerical Algebraic and Transcendental Equations and Simultaneous Linear Algebraic	15

	<p>Equations)</p> <p>Fitting a Straight line - Fitting a Parabola - Bisection method, Method of false position method - Newton Raphson method - Solving simultaneous algebraic equations - Gauss-Seidel method - Gauss elimination method.(Chapter 1, Sect 1.7-1.8, Chapter 3: Sec 2, 4 and 5, Chapter 4: Sec 2, 6 of [2])</p>	
V	<p>(Interpolation, Interpolation with unequal intervals, Numerical Differentiation and Integration and Numerical Solution of Ordinary Differential Equations)</p> <p>Interpolation – Newton’s forward and backward difference formulae – Lagrange’s interpolation formula - Numerical integration using Trapezoidal and Simpson’s one-third rules - solution of ODE’s - Euler method and Runge-Kutta fourth order method.</p> <p>(Chapter 6: Sec 1-4, Chapter 8: Sec 4, Chapter 9: Sec 8,10, Chapter 11: Sec 10,13,14,15)</p>	15
VI	<p>Numerical Solution of Ordinary Differential Equations: Solution by Taylor Series – Taylor Series method for Higher order differential Equations – Picards Method of Successive Approximations – Euler’s Method – Improved Euler’s Method – Modified Euler’s Method.</p> <p>(Chapter XI: Sec. 6,8 – 12)</p>	-

Text Books:

1. E. Balagurusamy, Programming in ANSI C, Sixth edition, Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi. (For Units I, II and III), 2021
2. M.K.Venkatraman, Numerical methods in Science and Engineering, National Publisher Company, Fifth Edition, 2001. (For Units IV and V).

Reference Books:

1. Yashavant.P.Kanetkar, Let us “C”, BPB Publications, 2002.
2. S.S. Sastry, Introductory Methods of Numerical Analysis, Third Edition, Prentice-Hall of India, 2000.

Web – Resources:

1. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjii6KIktjyAhUq7HMBHdg7C5EQFnoECAMQAO&url=https%3A%2F%2Fwww.math.ust.hk%2F~machas%2Fnumerical-methods.pdf&usg=AOvVaw2XYqzDmJzupEa79S98dhiS>
2. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjT8I2RgtjyAhWC7XMBHZknBY8QFnoECAMQAO&url=https%3A%2F%2Fwww.personal.acfr.usyd.edu.au%2Fbailey%2Ftext%2Ftext.pdf&usg=AOvVaw1vmjyKv3ynWgE-1Ifz4Th5>

Course Outcomes:

On completion of the course the learner will be able to

CO1 : Find the variables, constants, expressions and operators.

CO2 : Use functions and arrays.

CO3 : Write the programmes on arithmetic operations and recursion.

CO4 : Evaluate the linear equations and matrices numerically.

CO5 : Solve simultaneous system of equations using numerical techniques. Solve simultaneous system of equations using numerical techniques.

Mapping of Course outcomes with Programme Outcomes/ Programme Specific Outcomes

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-VI / Core Course-XIII(CC)	NUMERICAL METHODS WITH 'C'PROGRAMMING – PRACTICAL	Course Code: MUNY
Instruction Hours: 2	Credits: 2	Exam Hours: 3
Internal Marks:40	External Marks:60	Total Marks: 100

1. Solving a Quadratic Equation.
2. Sum of series (Sine , Cosine , e^x)
3. Ascending and descending order of numbers.
4. Largest and smallest of given numbers.
5. Sorting names in alphabetical order.
6. Finding factorial, generating Fibonacci numbers using recursive functions.
7. Matrix Manipulations (Addition, subtraction and Multiplication).
8. Mean Standard Deviation and Variance.
9. Solving equations by Bisection method
10. Solving equations by False position method
11. Solving equations by Newton –Raphson method
12. Gauss elimination method of solving simultaneous equations
13. GAUSS-Seidel method of solving simultaneous equations
14. Euler method ,Trapezoidal and Simpson's 1/3 rd rule of integration
15. .R-K Fourth order method of solving differential equations.

Semester-VI / Core Course-XIV(CC)	Astronomy	Course Code: MUO
Instruction Hours: 6	Credits: 5	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Analyze K5 - Evaluate K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To introduce the exciting world of astronomy. • To study spherical trigonometry in the field of astronomy. • To conceptualize the structure of the solar system and the universe. • To classify the difference between the planets, stars and types of galaxies in the universe. • To relate the earth, sun, galaxy with the universe. 	
UNIT	CONTENT	HOURS
I	Spherical Trigonometry Relevant properties of sphere and formulae in spherical trigonometry (no proof, no problems)-Celestial sphere and diurnal motion-Celestial coordinates-sidereal time. (Chapter I: properties and formulae only, Chapter II: Article 39-69)	18
II	Celestial Sphere Morning and evening stars-circumpolar stars- diagram of the celestial sphere -zones of earth-perpetual day-dip of horizon-twilight. (Chapter II: Article 80-82, 86,87,89,90, Sec 5: Article 10-109, Sec 6: Article 111-116)	18
III	Refraction Refraction-laws of refraction-tangent formula-Cassini's formula-horizontal refraction-geocentric parallax-horizontal parallax. (Chapter IV: Article 117-120, 129,130,131, Chapter V: Article 135)	18

IV	Kepler's Laws Kepler's laws - verification of 1 st and 2 nd laws in the case of earth - Anomalies -Kepler's equation-Seasons-causes-kinds of years. (Chapter VI, VII Article 173-175)	18
V	The Moon Moon-sidereal and synodic months - elongation - phase of moon - eclipses-umbra and penumbra-lunar and solar eclipses-ecliptic limits- maximum and minimum number of eclipses near anode an dina year Saros. (Chapter XII: Article 229-241, Chapter XIII: Article 256-259, 269,273-275)	18
VI	Astronomical Instruments: Sidereal Clock-Chronometer-Gnomon-Sun Dial-Astronomical Telescope-Heliometer-The Sextant-The Transit Circle Or Meridian Circle-The Equatorial- Filar Micrometer- Chronograph-Spectroscope-Radio Telescope. (Chapter XV: Article 305-320)	-

Text Books:

1. Kumaravelu S and Susheela Kumaravelu, Astronomy for degree classes, 7th edition SKV Publishers, Nagercoil, 1986.

Reference Books:

1. M. L. Khanna, Spherical Astronomy, Jai Prakash and Co, 1983.
2. Dinah L. Moche, Astronomy: A Self Teaching Guide, Eighth Edition, Wiley Publications, 2014

Web Resources:

<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiG4Lj3hdjyAhX6-nMBHavECa8QFnoECAIQAO&url=https%3A%2F%2Fwww.sisd.net%2Fcms%2Flib%2FTX01001452%2FCentricity%2FDomain%2F834%2FAstronomy%2520Textbook%2520Part%25201.pdf&usg=AOvVaw1UVXuvR3kA9XwCp9LQoO9h>

<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjm62NwOTvAhUMWX0KHca4BQMOfnoECAMQAO&url=https%3A%2F%2Fwww.nsf.gov%2Fnews%2Fclassroom%2FAstronomy.jsp&usg=AOvVaw3WCR1unwl8H77v7eX0QS5v>

Course Outcomes:

On completion of the course the learner will be able to

CO1 : Perform calculations on celestial bodies.

CO2 : Compare our galaxy with other galaxies.

CO3 : Apply the principles and fundamental techniques of the astronomy.

CO4 : Analyze the size, age structure and motion of the universe over all using cosmological models.

CO5 : Understand the phases of moon and occurrence of Eclipses.

Mapping of Course outcomes with Programme Outcomes/ Programme Specific Outcomes

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	M	W	M	S	M	M	M	M
CO2	S	M	M	W	M	S	M	M	S	M
CO3	M	M	M	W	M	M	M	M	M	M
CO4	S	S	M	W	M	S	M	M	M	M
CO5	S	S	M	W	M	S	M	M	M	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-VI / Elective Course-I(EC)	DISCRETE MATHEMATICS	Course Code: MUE4
Instruction Hours: 5	Credits: 4	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K 1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives	<ul style="list-style-type: none"> • To know Formal Languages • To understand the concept of permutations and Combinations • To study about Finite State Machines • To gain the knowledge of Numeric Functions • To know the concept of Recurrence Relations. 	
UNIT	CONTENT	HOURS
I	Computability And Formal Languages Languages – Phrase structure grammars – Types of grammars and languages. (Sections : 2.4 to 2.6)	15
II	Permutations , Combinations and Discrete Probability Introduction – The Rules of sum and Product – Permutations – Combinations – Generation of permutations and combinations.(Sections : 3.1 to 3.5)	15
III	Finite State Machines Introduction – Finite State Machines – Finite State Machines as Models of Physical systems – Equivalent Machines – Finite State Machines as language recognizers. (Sections: 7.1 to 7.5)	15
IV	Discrete Numeric Functions and Generating Functions Introduction – Manipulation of Numeric functions – Asymptotic behaviour of Numeric functions – Generating functions. (Sections: 9.1 to 9.4)	15

V	Recurrence Relations and Recursive Algorithms Introduction – recurrence relations – linear recurrence relations with constant coefficients – Homogeneous solutions – Particular solutions – Total solutions. (Sections 10.1 to 10.6)	15
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Text Books:

C.L. Liu, Elements of Discrete Mathematics , McGraw Hill Book Company, Second edition, 1985.

Reference Books

1. Knuth D.E – The art of Computer Programming , Volume III , Addison – Wesley Publishing Company, 1973.
2. Hopcroft J.E. and J.D. Ullman – Introduction to Automata Theory, Languages and Computation, Addison – Wesley, 1979.

Web Resources:

1. [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjgoP3h9jyAhVimeYKHTwtAJQQFnoECAIQAAQ&url=https%3A%2F%2Fgurukpo.com%2FContent%2FB.SC%2FDiscrete Maths.pdf&usq=A0vVaw3vrwMxdGVfyqoQ5SqJNrCi](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjgoP3h9jyAhVimeYKHTwtAJQQFnoECAIQAAQ&url=https%3A%2F%2Fgurukpo.com%2FContent%2FB.SC%2FDiscrete%20Maths.pdf&usq=A0vVaw3vrwMxdGVfyqoQ5SqJNrCi)
2. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiV6cenjd3yAhUbIbcAHfkhCZ8QFnoECAMQAAQ&url=http%3A%2F%2Fdiscrete.openmathbooks.org%2Fpdfs%2Fmoi-tablet.pdf&usq=A0vVaw3qckwD1F6JIR6GOQUarnb3>

Course Outcomes:

On completion of the course the learner will be able to

- | | |
|-----|--|
| CO1 | : Understand the basic concepts of Formal Languages. |
| CO2 | : Permutations and Combinations |
| CO3 | : Acquire knowledge about Finite State Machines |
| CO4 | : Understand Numeric Functions |
| CO5 | : Understand Recurrence Relations. |

Semester-VI / MBE-III	GRAPH THEORY	Course Code: MUE5
Instruction Hours: 5	Credits: 4	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K 1 - Acquire/ Remember K2 - Understand K3 - Apply K4 - Evaluate K5 - Analyze K6 - Create	
Course Objectives:	<ul style="list-style-type: none"> • To understand the basic concepts of the graphs. • To learn the various operations and degree sequences of graphs. • To discuss the properties of Hamiltonian graphs and trees. • To know about the planar graphs. • To gain the knowledge of colourability of the graph. 	
UNIT	CONTENT	HOURS
I	Graphs and Subgraphs: Introduction –The Konigsberg Bridge problem –Definition and examples –Degrees –Subgraphs –Isomorphism. (Chapter 1:Sections 1.0, 1.1 and Chapter 2:Section 2.1 -2.4)	15
II	Matrices and Degree Sequences: Matrices –Operations on graphs –Degree Sequences and Graphic Sequences–Walk, trails and paths – Connectedness and components. (Chapter 2: Sections 2.8 & 2.9, Chapter 3: Sections 3.1 & 3.2 and Chapter 4: Sections 4.1 & 4.2)	15
III	Hamiltonian graphs and Trees: Eulerian Graphs–Hamiltonian graphs –Characterization of Trees – Centre of a tree. (Chapter 5: Sections 5.1 &5.2 and Chapter 6: Sections 6.1 & 6.2)	15

IV	Planar Graphs: Introduction –Definition and properties –Characterization of Planar graphs. (Chapter 8: Section 8.0 – 8.2)	15
V	Colourability: Introduction –Chromatic number and chromatic index – The Five Colour Theorem –Four colour problem –Chromatic polynomials. (Chapter 9: Section 9.0 – 9.4)	15

Text Book:

1. S. Arumugam and S. Ramachandran, Invitation to Graph Theory, New Gamma Publishing House, Palayamkottai(2013).

Reference Books:

1. Gary Chartrand and Ping Zhang, Introduction to Graph Theory, Tata McGraw-Hill, NewYork(2006).
2. S. Kumaravelu, Susheela Kumaravelu, Graph Theory, Janki Calender Corporation, Sivakasi(1999).

Web Resources:

1. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjH_I6X-dfyAhXk4jgGHe-nCscQFnoECCiQAQ&url=https%3A%2F%2Fwww.zib.de%2Fgroetschel%2Fteaching%2FWS1314%2FBondyMurtyGTWA.pdf&usg=AOvVaw0AdrSj_OV0mNm_RmBixjQS
2. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwit-6j1w-TyAhXFV30KHYYvPA8kQFnoECAoQAQ&url=http%3A%2F%2Fwww.nrce.niepa.ac.in%2Fmod%2Fpage%2Fview.php%3Fid%3D3681&usg=AOvVaw3Ri7FhsEm7bd7Kz29CiYpg>

Course Outcomes:

On completion of the course the learner will be able to

- CO 1: Understand the concepts of graphs upto isomorphism.
- CO 2: Acquire the knowledge of degree sequences, connectedness and components of graphs.
- CO3: Demonstrate the characterization of Eulerian, Hamiltonian and trees.
- CO4: Interpret the planarity of graphs.
- CO5: Identify the chromatic number, index and polynomial of a graph.

Semester-VI / GS	GENDER STUDIES	Course Code: GS
Instruction Hours: 1	Credits: 1	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K1-Acquire / Remember K2-Understanding K3-Apply K4-Analyze K5-Evaluate K6-Create	
Course Objectives	<ul style="list-style-type: none"> • To make boys and girls aware of each other's strengths and weakness. • To develop sensitivity towards both genders in order to lead an ethically enriched life. • To promote attitudinal change towards a gender balanced ambience and women empowerment. • To train students to meet the demands of an increasingly ethnically and gender-diverse workplace; • To offer courses that document women's lives, the lives of people across gender spectrums, and critically examine gender ideologies 	
UNIT	CONTENT	HOURS
I	Concepts of Gender :Sex-Gender-Biological Determinism-Patriarchy-Feminism-Gender Discrimination-Gender Division of Labour –Gender Stereotyping-Gender Sensitivity-Gender Equity-Equality-Gender Mainstreaming-Empowerment	3
II	Women's Studies Vs Gender Studies :UGC's Guidelines-VII to XI Plans-Gender Studies: Beijing Conference and CEDAW-Exclusiveness and Inclusiveness	3
III	Areas of Gender Discrimination : Family - Sex Ratio – Literacy – Health – Governance -Religion Work Vs Employment – Market – Media – Politics – Law – Domestic	3

	Violence – Sexual Harassment – State Policies and Planning.	
IV	Women Development and Gender Empowerment :Initiatives – International Women’s Decade – International women’s Year – National Policy for Empowerment of Women – women Empowerment Year 2001 – Mainstreaming Global Policies	3
V	Women’s Movements and Safeguarding Mechanism : In India National / State Commission for Women (NCW) – All Women Police Station- Family Court – Domestic Violence Act – Prevention of Sexual Harassment at Work Place Supreme Court Guidelines – Maternity Benefit Act – PNDT Act – Hindu Succession Act 2005 – Eve Teasing Prevention Act – Self Help Groups – 73 rd and 74 th Amendment for PRIS.	3

REFERENCES

1. Bhasin Kamala, Understanding Gender; Gender basics, New Delhi. Women Unlimited 2004
2. Bhain Kamala, Exploring Masculinity : Gender Basics, New Delhi. Women Unlimited, 2004
3. Bhasin Kamala, What is Patriarchy? Gender Basics, New Delhi Women Unlimited, 1993
4. Pernau Margrit, Ahmad Imtiaz, Reifeld Hermut (ed.), Family and Gender : Changing values in Germany and India, New Delhi: Stage Publication 2003
5. Agarwal Bina, Humphries Jane and Robeyns Ingrid (ed.), Capabilities, Freedom, and Equality: Amartya Sen’s Work from a Gender Perspective, New Delhi: Oxford University Press ,2006
6. Rajadarai, S.V, Geetha .V, Themes in Caste Gender and Religion, Tiruchirappalli: Bharthidasan University, 2007
7. Misra Geetanjali, Chandiramani Radhika (ed.) Sexuality, Gender and Rights: Exploring Theory and Practice in South Southeast, Asia, New Delhi: Sage Publication, 2005
8. Rao Anupama (ed.) Gender & Caste: Issues in Contemporary Indian Feminism, New Delhi: Kali for Women 2003
9. Saha Chandana, Gender Equity and Gender Equality: Study of Girl Child in Rajathen, Jaipur: Rawat Publications:2003.

10. Krishna Sumi, (ed) Livelihood and Gender Equity in Community Resource Management, New Delhi: Sage Publication, 2004
11. Paludi A Michele (ed,) Praeger Guide to the Psychology of Gender, London: Praeger Publisher, 2004
12. Wharton. S Amy, The Sociology of Gender: An Introduction to Theory and Research, USA: Blackwell Publishing 2005.
13. Mohanty Manoranjan (ed.), Class, Caste, Gender: Readings in Indian Government and Politics- 5, New Delhi: Sage Publication, 2004
14. Arya Sadhna, Women, Gender Equality and the State, New Delhi: Deep & Deep Publications, 2000
15. Mishra. O.P Law Relating to Women Child, Allabhad; Central Law Agency, 2001
16. Chari leelavathi, Know Your Rights, Madras; Tamilnadu Social Weldare Board, 1987
17. Bhattacharya Malini, Sexual Violence and Law Kolkata; West Bengala Commission for Women, 2002
18. Sexual Harassment at the Workplace- A Guide, New Delhi, Sakshi, 1999