E-mail : josecol27998@gmail.com
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1.1.2: The programmes offered by the institution focus on employability / entrepreneurship / skill development and their course syllabi are adequately revised to incorporate contemporary requirements

SYLLABUS OF THE COURSES FOCUSING EMPLOYABILITY / ENTREPRENEURSHIP / SKILL DEVELOPMENT

Colour Coding

EMPLOYABILITY

ENTREPRENEURSHIP

SKILL DEVELOPMENT

B.Sc. MATHEMATICS

I-B.Sc. (MATHS)	ALGEBRA AND TRIGONOMETRY	21MT101
SEMESTER-I	For the students admitted from the year 2021	HRS/WK – 5
CORE-I		CREDIT – 4

OBJECTIVES

The course aim is to introduce the concepts of Theory of Equations, Summation of Series, Matrices and Elementary Number theory.

COURSE OUTCOMES:

At the end of the course students will be able to

CO1: Find the solutions of cubic and polynomial equations.

CO2: Find the summation of varies types of series.

CO3: Find the rank, Eigen valves of matrices.

CO4: Solve system of linear congruence's and apply Euler-Fermat's, Wilson's theorem to Prove relations involving prime numbers.

CO5: Find expansions of trigonometric values and solutions of trigonometric equations.

SEMESTER I	COURSE CODE: 21MT101					COURSE TITLE: ALGEBRA AND TRIGNOMETRY									HOURS 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	4	4	3	3	4	5	5	2	4	3	5	2	3	4	3.6
CO2	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46
CO3	3	4	4	3	3	4	4	5	2	4	3	5	2	2	4	3.46
CO4	3	4	4	3	3	4	5	5	2	4	3	5	3	2	4	3.6
CO5	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46
Mean Overall Score																3.5

Result: This Score of this course is 3.5 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes

UNIT - I: THEORY OF EQUATIONS

Polynomial Equations - Imaginary and Irrational roots – Symmetric Functions of roots in terms of Coefficients – Transformation of Equations- Approximate Solutions of Polynomials by Horner's method – Newton's method of Solution of a cubic polynomial.

UNIT -II: SUMMATION OF SERIES AND MATRICES

Exponential and Logarithmic series [Theorems without proofs]. **MATRICES:** Inverse of a matrix using Cayley Hamilton Theorem [without proof] – Eigen Values – Eigen Vectors – Diagonalisation of matrix.

UNIT - III: ELEMENTARY NUMBER THEORY

Prime Number – Composite Number – Decomposition of a Composite Number as a Product of Primes uniquely [without proof] – Divisors of a Positive Integer – Congruence Modulo n – Euler Function [without proof] – Highest Power of a Prime Number p contained in n! – Fermat's and Wilson's Theorems (without proof)

UNIT-IV: TRIGONOMETRY

Expansion of cosnθ, sinnθ- Expansion of tannθ in terms of tanθ- Expansion of Tan [A+B+C+…] -solution of trigonometric equations. Powers of sines and cosines of θ in terms of functions of multiples of θ - Expansions of sinθ, cosθ and tanθ in a series of ascending powers of θ.

UNIT -V: TRIGONOMETRY (Continued)

Hyperbolic functions – Relations between hyperbolic functions and circular trigonometry functions – Inverse hyperbolic functions – Logarithm of complex numbers- Real and Imaginary parts.

TEXT BOOKS:

1. T.K. Manicavachagom Pillay, T. Natarajan and K.S. Ganapathy [2004], "Algebra", Volume I &II. S. Viswanathans Printers Pvt. Ltd. Chennai.
Unit I: Chapter 6 (Sec 9 – 13, 15, 16, 25, 26)
Unit II: Series- Chapter 4 (Sec 2, 3, 5 - 9), Matrices -Chapter 2 (16)
2. T.K. Manicavachagom Pillay, T. Natarajan and K.S. Ganapathy [2004], "Trigonometry", Volume I & II. S. Viswanathans Printers Pvt. Ltd. Chennai.
Unit IV: Chapter 3
Unit V: Chapter 4 & Chapter 5 (Sec-5)

REFERENCE BOOKS:

1. P. Kandasamy, K. Thilagavathy [2004], "Mathematics for B.Sc.", Volume- I, II, III & IV, S. Chand & Company Ltd., New Delhi-55.
2. S. Arumugam [2003], "Algebra", New Gamma Publishing House, Palayamkottai.
3. A. Singaravelu [2003], "Algebra and Trigonometry", Volume – I &II, Meenakshi Agency, Chennai.
4. S. Sudha [1998], "Algebra and Trigonometry", Emerald Publishes, Chennai.

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I – B.Sc. (Maths)	ANALYTICAL GEOMRTRY OF THREE DIMENSIONS For the students admitted from the year 2018	MT102P
SEMESTER – I		HRS/WK – 6
CORE – II		CREDIT – 4

OBJECTIVES:
To acquire the knowledge of equation on plane, straight line, sphere, cone and cylinder in the three-dimensional space.

COURSE OUTCOMES:
The students after undergoing this course will be able to
CO1: Understand more about three dimension using planes
CO2: Learn straight lines and its symmetrical form problems using straight line
CO3: Study more about straight lines using coplanar and shortest distance between the lines
CO4: Analyze the concepts associated with spheres and solve problems using sphere
CO5: Analyze more about three dimensions using cone and cylinder

SEMESTER I	COURSE CODE: MT102P					COURSE TITLE: ANALYTICAL GOEMETRY OF THREE DIMENSIONS										HOURS 6	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10		
CO1	5	5	4	4	3	3	4	4	3	4	3	5	4	3	4	3.87	
CO2	4	4	4	3	3	3	3	3	3	3	3	5	4	2	3	3.3	
CO3	4	4	4	4	2	3	4	4	3	4	3	5	4	2	4	3.6	
CO4	4	4	4	2	2	3	5	3	3	4	2	3	4	2	5	3.3	
CO5	3	4	4	3	3	3	5	3	3	4	2	3	4	2	4	3.3	
Mean Overall Score																3.47	

Result: This Score of this course is 3.47 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT - I: PLANES
General equation – passing through three points – angle between the planes - line of intersection – length of the perpendicular – plane bisecting the angle between the Plane.

UNIT - II: STRAIGHT LINES
Symmetrical form – passing through two points– plane and straight line – Angle between the Plane and the Line.

Unit-III: STRAIGHT LINES (Continued)
Coplanar lines – condition for the lines to be coplanar - shortest distance between two lines – Intersection of three Planes.

UNIT - IV: THE SPHERE
Equation of a sphere - length of tangent to the sphere - plane section of spheres- intersection of two spheres - Tangent plane to the sphere.

UNIT - V: CONE AND CYLINDER
Equation of a cone – Intersection of a straight line and a quadric cone – tangent plane and normal – Cylinder – Right circular cylinder – Equation of an Enveloping cylinder.

TEXT BOOK:
1. T.K. Manicavachagom Pillay & T. Natrajan (2011), "Analytical Geometry, part II - Three Dimensions", S. Viswanathan Printers & Publishers Pvt. Ltd. Chennai.
Unit-I: Chapter: 2.1 – 2.11,
Unit-II: Chapter: 3.1 - 3.6,
Unit-III: Chapter: 3.7 - 3.8,
Unit-IV: Chapter: 4.1 - 4.8,
Unit-V: Chapter: 5.2, 5.2.1, 5.3, 5.4, 5.5, 5.6 & 8, 8.1, 8.2, 8.3.

REFERENCE BOOKS:
1. Duraipandian and Laxmi Duraipandian (1965), "Analytical Geometry – 3D", Emerald Publishers, Chennai.
2. S. Santha &T. Pathinathan (2005), "3D Analytical Geometry & Propability", Vijay Nicole Imprints Pvt. Ltd. Chennai.
3. P.R. Vittal [2003], "Coordinate Geometry", Margham Publication, Chennai.
4. P. Kandasamy, K. Thilagavathy (2004), "Mathematics for B.Sc." Vol-I, II, III & IV,
S. Chand &Company Ltd, New Delhi-55.

I – B.Sc. (Maths)		**21MT203**
SEMESTER – II	**CALCULUS**	**HRS/WK – 6**
CORE – IV	**For the students admitted from the year2021**	**CREDIT – 4**

OBJECTIVES:

The course aims to introduce the concepts of Differential Calculus, Curvature, P-R equations, Linear asymptotes, Double integrals, changing the order of Integration, Triple Integrals, Beta & Gamma functions between a, Integration using Beta & Gamma functions

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit
CO1: Knowing the basics of differential calculus
CO2: Getting the knowledge of coordinates in differential calculus
CO3: Knowing the asymptotes of differential calculus
CO4: Knowing the basics of integral calculus
CO5: Receiving the knowledge of applications of integrals

SEMESTER II	COURSE CODE: 21MT203					COURSE TITLE: CALCULUS									HRS 6	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	4	3	4	3	2	5	4	3	4	3	4	2	2	4	3.3
CO2	3	4	3	3	2	2	5	3	2	3	3	4	2	3	4	3.1
CO3	4	3	2	3	2	3	4	5	2	4	4	5	3	2	3	3.3
CO4	3	4	2	2	3	2	5	3	2	3	2	4	2	3	2	2.8
CO5	4	5	3	2	2	3	5	3	3	3	4	5	2	3	3	3.5
Mean Overall Score																3.2

Result: This Score of this course is 3.2 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with programme outcomes and programme specific outcomes.

UNIT I – DIFFERENTIAL CALCULUS

Homogeneous functions – Partial derivatives of a function of two functions – Maxima and minima of function of two variables - Lagrange's method of undetermined Multipliers.

UNIT II – DIFFERENTIAL CALCULUS (Continued)

Curvature: Radius and Center of Curvature- Cartesian Formula for the Radius of Curvature – Coordinates of the Centre of Curvature

UNIT III- DIFFERENTIAL CALCULUS (Continued)

Radius of Curvature when the curve is given in Polar coordinates, P-R equations, Linear asymptotes.

UNIT IV- INTEGRAL CALCULUS

Double integrals – changing the order of Integration – Triple Integrals

UNIT V- INTEGRAL CALCULUS (Continued)

Beta & Gamma functions and the relation between them –Integration using Beta & Gamma functions

TEXT BOOKS:

1. S. Narayanan and T.K. Manicavachagom Pillai, Differential Calculus Volume - I, S. Viswanathan (Printers & Publishers) Pvt. Limited, Chennai, Reprint -2011
UNIT - I: Chapter 8: Sec 1.6, 1.7 Sec 4, 5
UNIT - II: Chapter 9: Sec 2.7- 2.8, Chapter 10 Sec 2.1- 2.6
UNIT – III - Chapter 11: Sections 1-7,12 & 13
2. S. Narayanan and T. K. Manicavachagom Pillai, Integral Calculus Volume I, S. Viswanathan. (Printers & Publishers) Pvt. Limited, Chennai, Reprint- 2011
UNIT – IV - Chapter 5 Sections 2.1, 2.2 & Section 4
UNIT – V - Chapter 7 Sections 2.1 to 5

REFERNECE BOOKS:

1. P. Kandasamy, K. Thilagavathy [2004], "Mathematics for B.Sc.", Vol-I &II, S. Chand & Company Ltd., New Delhi-55.
2. Shanti Narayan [2001], "Differential Calculus", Shyamlal Charitable Trust, New Delhi.
3. Shanti Narayan [2001], "Integral Calculus", S. Chand & Co. New Delhi.
3. S. Sudha [1998], "Calculus", Emerald publishers, Chennai.
4. G.B. Thomas and R.L. Finney [1998], "Calculus and Analytic Geometry", Addison Wesley [9th Ed], Mass. [Indian Print].
5. P.R. Vittal [2004], "Calculus", Margham Publication, Chennai.

I – B.Sc. (Maths)	NUMERICAL METHODS	21MT204
SEMESTER – II	For the students admitted from the year 2021	HRS/WK – 5
CORE – V		CREDIT – 4

OBJECTIVES

The course aims to introduce the concepts of Finite differences, Central differences, Interpolation for unequal intervals, Inverse interpolation and Solutions of simultaneous linear equations.

COURSE OUTCOMES:

At the end of the course students will be able to

CO1: Students able to solve the problems in Newton's forward and backward method.

CO2: Students able to solve analyze the difference between Gauss forward and backward, Stirring's method and Bessel's method.

CO3: Students able to certain equal intervals and unequal intervals.

CO4: Students able to determine the solutions for lineal algebraic equations.

CO5: Students able to determine the solutions for Numerical differential equations and integration.

SEMESTER II	COURSE CODE 21MT204					COURSE TITLE: NUMERICAL METHODS										HOURS 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10		
CO1	3	4	4	3	3	4	5	5	2	4	3	5	2	3	4	3.6	
CO2	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46	
CO3	3	4	4	3	3	4	4	5	2	4	3	5	2	2	4	3.46	
CO4	3	4	4	3	3	4	5	5	2	4	3	5	3	2	4	3.6	
CO5	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46	
Mean Overall Score																3.5	

Result: The Score of this Course is 3.5 (High)

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Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with programme outcomes and programme specific outcomes

UNIT- I: FINITE DIFFERENCES

First and higher order differences-forward differences and Backward differences -Operators, Relation between ∇, Δ and E – Interpolation –Gregory- Newton's forward & backward formulae for interpolation.

UNIT-II: CENTRAL DIFFERENCES

Central difference operators – Central differences formulae- Gauss Forward and Backward formulae – Stirling's formula – Bessel's formula.

UNIT–III: INTERPOLATING FOR UNEQUAL INTERVALS AND INVERSE INTERPOLATION

Divided differences – Newton's divided differences formula and Lagrange's interpolation formula – Estimating the Missing terms [with one or more missing values] – Inverse Lagrange's method.

UNIT – IV: LINEAR ALGEBRAIC EQUATIONS

Gauss Elimination Method – Gauss Jordan Method- Gauss Seidal Method – Crout's Method [Three unknowns only]- Inverse of a Matrix-Gaussian Method.

UNIT – V: NUMERICAL DIFFERENTIAL EQUATIONS AND INTEGRATION

Euler's method: Improved Euler's method, Modified Euler's method- The Runge Kutta Method of first order differential equations-Adam's Method-Trapezoidal rule-Simpson's 1/3rd rule (Simple problems only)

TEXT BOOKS:

1. A. Singaravelu [2004], "Numerical Methods", Meenakshi Agency, Chennai
2.M.K. Venkataraman (1992), "Numerical Methods for Science and Engineering", National Publishing Company, Chennai.

UNIT-I: Chapter 3: 3.1, 3.2,3.3,3.4,3.5,3.12,3.13,3.15
UNIT II: Chapter 3: 3.6,3.7,3.8,3.9,3.10
UNIT III: Chapter 4: 4.1,4.2,4.4,4.9,4.15
UNIT IV: Chapter 2: 2.41,2.47,2.52,2.61,2.77
UNIT V: Chapter 5: 5.12,5.13,5.14,5.19,5.54, Chapter 4: 4.31

REFERENCE BOOKS:

1. S. Arumugham[2003], "Numerical Methods", New Gamma Publishing, Palayamkottai.
2. H.C. Saxena [1991], "Finite Differences and Numerical Analysis", S. Chand & Co. Delhi.
3. B.D. Gupta (2001), "Numerical Analysis", Konark Pub. Ltd., Delhi.
4. P. Kandasamy, K. Thilagavathy [2003], "Calculus of Finite difference & Numerical Analysis", S. Chand & Company Ltd., New Delhi-55.

II – B.Sc. (Maths)	**DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORM**	**20MT305**
SEMESTER – III		**HRS/WK – 5**
CORE – VI	**For the students admitted from the year 2020**	**CREDIT – 4**

OBJECTIVES

The course aims to introduce the concepts of Equations of the First Order and Higher Degree, Euler's homogeneous linear equations, Legendre's Linear Equations, Simultaneous Equations, Laplace Transform and Formation of PDF.

COURSE OUTCOMES:

CO1: Students able to know the basics in Equations of the First Order and Higher Degree
CO2: Students able to understand Euler's homogeneous linear equations
CO3: Students able to do the problems in Different Methods in Differential Equations.
CO4: Students able to study the basics to know the Format of Partial Differential Equation
CO5: Students able to know the Laplace and inverse Transform and Formation of PDF

SEMESTER III	COURSE CODE: 20MT305					COURSE TITLE: DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORM										HOURS: 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10		
CO1	3	4	3	4	4	2	3	4	3	4	3	5	2	3	4	3.5	
CO2	3	3	3	4	2	2	5	4	2	3	3	4	2	3	4	3.1	
CO3	4	3	2	3	2	3	4	5	2	3	4	5	3	2	3	3.2	
CO4	3	4	4	2	3	2	5	3	4	3	2	4	3	3	2	3.0	
CO5	4	5	3	2	2	3	5	3	3	3	5	5	2	3	3	3.4	
Mean Overall Score																3.24	

Result: The Score of this Course is 3.24 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with programme outcomes and programme specific outcomes.

UNIT-I: ORDINARY LINEAR DIFFERENTIAL EQUATIONS:

Equations of the First Order and Higher Degree- Equations Solvable for p- Equations Solvable for x - Equations Solvable for y – Clairaut's Equation- Equations of second and higher order with constant coefficients.

UNIT – II: ORDINARY LINEAR DIFFERENTIAL EQUATIONS (Continued)

Euler's homogeneous linear equations – Legendre's Linear Equations- Method of Variation of Parameters- Method of undetermined Coefficients.

UNIT -III: PARTIAL DIFFERENTIAL EQUATIONS

Formation of PDE – Complete Integral – Particular Integral – Singular Integral – Equation's Solvable by direct Integration – Solving equations of the types: $f(p, q) = 0$, $f(x, p, q) = 0$, $f(y, p, q) = 0$, $f(z, p, q) = 0$, $f(x, p) = f(y, p)$, $Z = p x + q y + f(p, q)$ - Lagrange's equations.

UNIT – IV: LAPLACE TRANSFORM

Laplace Transform of Standard functions – Properties of Laplace Transforms – First Shifting Theorem and Problems

UNIT – V: INVERSE LAPLACE TRANSFORM

Inverse Laplace Transform – Application of Laplace Transform to solution of first and second order linear Differential equations [with constant coefficients]

TEXT BOOK:

1. P. Kandasamy, K. Thilagavathy [2004], "Mathematics for B.Sc." Vol-III, Chand & Company Ltd., New Delhi-55.
   - Unit-I: Chapters: 1,2,3 (PP: 1 – 47)
   - Unit-II: Chapters: 4,5 (PP: 48 -87)
   - Unit-III: Chapter: 1 (PP: 117 – 162)
   - Unit-IV: Chapters: 1 (PP: 187 – 202)
   - Unit-V: Chapter: 1 (PP:202 – 244)

REFERENCE BOOKS:

1.M.D. Raisighanian, [2001], "Ordinary and Partial Differential Equations", S.Chand and Co., New Delhi

2. S. Sudha [1998], "Differential Equations and Integral Transforms", Emerald publishers, Chennai.

3. P.R. Vittal [2004], "Differential Equations and Laplace Transform", Margham Publication, Chennai.

4. M.K. Venkataraman (1992)," Higher Engineering Mathematics", National Publishing Company, Chennai.

II – B.Sc. (Maths)		**20MT306**
SEMESTER – III	**VECTOR AND FOURIER ANALYSIS**	**HRS/WK – 6**
CORE – VIII	**For the students admitted from the year 2020**	**CREDIT – 4**

OBJECTIVES:

The course aims to introduce the concepts of Differentiation of a Vector, Vector Differential Operator, Solenoidal and Irrotational, The Line Integral, Divergence Theorem and Green's Theorem, Stoke's Theorem, Fourier Expansion and Parseval's Identity for Fourier Transforms.

COURSE OUTCOMES:

At the end of the course students will be able to

CO1: learns to solve problems on gradient and divergence and curl

CO2: knows the difference in line, surface and volume integral and their interpretation

CO3: enables to understand the concepts on Fourier series expansions and familiarizes with half range Fourier series along with periodic functions

CO4: analyze sine and cosine transforms

CO5: enables to understand the properties of Fourier transform, Convolution and Parseval's theorem

SEMESTER III	COURSE CODE: 20MT306					COURSE TITLE: VECTOR AND FOURIER ANALYSIS									HOURS 6	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	4	3	3	4	4	3	3	3	3	4	3	4	3	4	3.4
CO2	3	3	3	4	3	3	4	4	3	4	3	4	3	3	3	3.3
CO3	3	3	3	4	3	4	3	3	3	3	3	4	3	4	3	3.3
CO4	3	3	4	4	3	3	4	4	3	3	3	4	3	4	3	3.4
CO5	3	4	3	3	3	4	3	4	3	3	3	4	4	3	3	3.3
Mean Overall Score																3.3

Result: The Score of this Course is 3.3 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT– I: GRADIENT, DIVERGENCE AND CURL

Gradient of a Scalar Function – Directional Derivative – Geometric Interpretation – Operations involving Del – Divergence of a Vector and its Physical Interpretation – Curl of a Vector and its Physical Interpretation – Solenoidal and Irrotational – Vector Identities.

UNIT– II: VECTOR INTEGRATION

The Line Integral – Surface Integral –Volume Integral – Theorem of Gauss Divergence, Stoke's Theorem and Green's Theorem [Without proof].

UNIT– III: FOURIER SERIES

Conditions for Fourier Expansion – Generalized Fourier Series in $(-\pi, \pi)$ and $(0, 2\pi)$ Odd and Even Functions – Half range series – Typical Wave Forms – Parseval's Formula.

UNIT – IV: FOURIER TRANSFORM

Definition – Fourier Integrals – Fourier Sine and Cosine Integral – Complex Form of Fourier Integral – Fourier Transform: Fourier Sine and Cosine Transforms – Finite Fourier Sine and Cosine Transforms [without proof]-Simple Problems

UNIT-V: FOURIER TRANSFORM (Continued)

Properties of Fourier Transforms – Convolution Theorem for Fourier Transforms – Parseval's Identity for Fourier Transforms – [without derivation]-Simple Problems

TEXT BOOKS:

1. P.R. Vittal [2004], "Vector Analysis, Analytical Solid Geometry & Sequences & Series", Margham Publication, Chennai.
Unit-I: Chapter-1, Unit-II: Chapter-2.
2. P.R. Vittal [2002], "Differential equations, Fourier &Laplace Transforms and Probability". Margham Publication, Chennai.
Unit-III, IV & V: Chapter- 6 & 8.

REFERENCE BOOKS:

1. B.S. Grewal, "Higher Engineering Mathematics" [2002], Khanna Publishers, New Delhi.
2. M.K. Venkataraman (1992), "Higher Engineering Mathematics", National Publishing Company, Chennai.

II – B.Sc. (Maths)		**MT407S**
SEMESTER – IV	**FUZZY SETS AND APPLICATIONS**	**HRS/WK – 6**
CORE – IX	**For the students admitted from the year 2017**	**CREDIT – 4**

OBJECTIVES:

To get formalized with fuzzy principles and appreciate its nuances by constricting with crisp set and principles

COURSE OUTCOMES:

At the end of the course students will be able to

CO1: Provides knowledge on the basic definitions and fundamentals of Fuzzy set theory.

CO2: Able to understand idea on Fuzzy graphs and its properties

CO3: Improves their ability in the concept of Fuzzy relations in real life situations

CO4: Attains knowledge of the Fuzzy Logic in different forms

CO5: understands the applications of Fuzzy logic in day to needs

SEMESTER IV	COURSE CODE: MT407S					COURSE TITLE: FUZZY SETS AND APPLICATIONS									HOURS 6	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	3	3	4	4	4	3	3	4	3	4	3	3	3	4	3.5
CO2	4	3	4	4	3	4	3	4	3	4	4	3	3	4	3	3.5
CO3	3	3	4	3	4	3	4	3	3	4	3	3	4	4	4	3.5
CO4	3	4	3	3	3	4	3	4	3	3	3	4	3	4	4	3.4
CO5	4	4	4	4	3	4	3	4	4	3	4	4	3	3	3	3.6
Mean Overall Score																3.5

Result: The Score of this Course is 3.5 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT I - FUZZY SET THEORY

Fuzzy sets – Definitions of fuzzy set – Different types of fuzzy sets – General properties of fuzzy sets – Important operations on fuzzy sets – General properties of Fuzzy vs Crisp.

(Sec: 1.16 – 1.21)

UNIT II – OPERATIONS ON FUZZY SETS

Introduction – Some important theorems – fuzzy compliments – Further operations on fuzzy sets – t-norms and t-conorms – Intersection and union of fuzzy sets.

(Sec: 2.1, 2.2, 2.4 – 2.9)

UNIT III – FUZZY NUMBERS AND ARITHMETIC

Introduction – fuzzy numbers – algebraic operations with fuzzy numbers – binary operation of two fuzzy numbers – Some special extended operations – Interval analysis in arithmetic – Lattice of fuzzy numbers.

(Sec: 3.1 – 3.5 and 3.11, 3.12)

UNIT IV – FUZZY RELATIONS AND FUZZY GRAPHS.

Introduction – Composition – Properties of Min-max composition – binary relations on a single set – compatibility relation – fuzzy ordering relation.

(Sec: 4.1 and 4.3 -4.7)

UNIT V – FUZZY LOGIC

Fuzzy logic – Fuzzy connectives – fuzzy inference – fuzzy propositions – fuzzy quantifiers – linguistic hedges.

(Sec: 7.13 – 7.18)

TEXT BOOK:

1. Dr. Sudhir K. Pundir and Dr. Rimple Pundir, Fuzzy sets and their applications.

REFERENCE BOOK:

1. A. Kaufman, Introduction to the theory of Fuzzy subsets, Vol I, (1975) Academic Press, New York.

II – B.Sc. (Maths)	**GRAPH THEORY** **For the students admitted from the year 2008**	**MT408**
SEMESTER – IV		**HRS/WK - 5**
CORE – X		**CREDIT - 4**

OBJECTIVES

The course aim is to introduce the concepts of Graphs, Sub graphs, Adjacency and incidence matrices, Connectedness and components, Eulerian graphs and Hamiltonian graphs, Characterizations of planar graph and chromatic number and index.

COURSE OUTCOMES:

At the end of the course students will be able to

CO1: Know the variety of example and some elementary results.

CO2: Learn to justify some operation and mathematical expression on graph.

CO3: know the basic properties of connected and disconnected graphs.

CO4: Able to understand the concept of Euler and Hamiltonian in the area of puzzles and Games

CO5: Enable to understand the Chemical composition using trees and colouring in real life Situations.

SEMESTER IV	COURSE CODE: MT408					COURSE TITLE: GRAPH THEORY									HOURS 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	2	5	2	2	2	3	5	2	4	4	2	3	4	3	4	3.1
CO2	4	5	3	4	3	4	4	3	5	4	3	4	5	3	5	3.9
CO3	2	4	3	3	2	3	5	2	4	5	2	3	4	4	4	3.3
CO4	3	5	3	4	2	5	4	3	3	4	3	3	5	3	4	3.6
CO5	2	4	3	4	2	3	5	2	4	4	2	4	4	4	4	3.4
Mean Overall Score																3.4

Result: The Score of this Course is 3.4 (High)

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Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes

UNIT – I:

Graphs- Sub graphs- Basic Definition of a graphs-Degree of a Vertex- Isomorphism of graph- Automorphism of graph-Independent sets and Coverings- Intersection graphs (proved theorems and simple examples).

UNIT –II:

Adjacency and Incidence Matrices of a graph- Operations on graphs -Addition, Union, Multiplication of graphs- Degree sequences- Graphic sequences- Walks- Trails- paths.(Proved theorems and simple examples)

UNIT –III:

Connectedness and Componentsof a graph- Cut point of a graph- Bridge and bond number- Block- Vertex connectivity and Edge connectivity - Connectivity Theorems and examples.

UNIT – IV:

Eulerian graphs - Definitions - Properties and theorems- Hamiltonian graphs- Definition- Properties and theorems -trees- Definition and example-Equivalent statement- Properties and theorems.

UNIT – V:

Planarity-Definition- Examples-Some of the Characterizations of planar graphs- Colourability- Chromatic number and Index-Proved theorems and examples.

TEXT BOOK:

1. S. Arumugam and S. Ramachandran, "Invitation to Graph Theory", Sitech Publications India, Pvt Ltd, 7/3C, Madley Road, T. Nagar, Chennai – 17.
Unit-I: Chapters: 2 (Sec:2.0 - 2.7),
Unit-II: Chapters: 2,3 & 4 (Sec:2.8 - 2.9,3.0-3.2,4.0-4.1),
Unit-III: Chapters: 4 (Sec:4.2,4.3,4.3,4.4),
Unit-IV: Chapters: 5 &6 (Sec:5.0 - 5.2,6.0-6.2),
Unit-V: Chapters: 8 & 9 (Sec: 8.0 - 8.2, 9.0-9.1).

REFERENCE BOOKS:

1. S. Kumaravelu, and Susheela Kumaravelu, "Graph Theory", Publishers, 182, Chidambara Nagar, Nagercoil-629 002.
2. S. A. Choudham, "A First Course in Graph Theory", Macmillan India Ltd.
3. Robin J. Wilson, "Introduction to Graph Theory", Longman Group Ltd.
4. J.A. Bondy and U. S. R. Murthy, "Graph Theory with Applications", Macmillan, London.

YEAR – III	**ABSTRACT ALGEBRA**	**MT509**
SEMESTER –V		**Hrs. / Week: 6**
CORE –XII	**For the students admitted from the year 2008**	**Credit: 5**

OBJECTIVE:

The Course aim is to introduce the concept of groups and rings and study the notion related theorems

COURSE OUTCOMES:

At the end of the course students will be able to

CO1: Students able to identify groups and subgroups.

CO2: Students able to understand homomorphism and isomorphism.

CO3: Students able to do the problems in permutation.

CO4: Students able to study the basics of rings, ideals and integral domain.

CO5: Students able to apply Euclidean rings in theorems**.**

SEMESTER V	COURSE CODE: MT509					COURSE TITLE: ABSTRACT ALGEBRA									HOURS 6	CREDITS 5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	4	4	3	3	4	5	5	2	4	3	5	2	3	4	3.60
CO2	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46
CO3	3	4	4	3	3	4	4	5	2	4	3	5	2	2	4	3.46
CO4	3	4	4	3	3	4	5	5	2	4	3	5	3	2	4	3.60
CO5	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46
Mean Overall Score																3.50

Result: The Score of this Course is 3.5 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes

UNIT – I: GROUPS
Definition of a Group – Some examples of Groups - Some preliminary lemmas – Subgroups-Congruence-order of a group – Lagrange's Theorem-Fermat's theorem.
Chapter: 2 (Sec: 2.1 – 2.4)

UNIT – II: GROUPS (Continued)
Counting Principle – Normal Subgroups and Quotient Groups – Homomorphism–Isomorphism.
Chapter: 2 (Sec: 2.5 – 2.7) [Omit Applications 1 and 2 of 2.7])

UNIT – III: GROUPS (Continued)
Automorphisms – Inner automorphisms- Cayley's Theorem – Permutation Groups.
Chapter: 2 (Sec: 2.8 – 2.10)

UNIT – IV: RINGS
Definition and Examples of rings –some special Classes of rings- Integral Domain Homomorphism of Rings -Ideals and Quotient Rings.
Chapter :3 (Sec: 3.1, 3.2, 3.3, 3.4)

UNIT – V: RINGS (Continued)
More ideals and Quotient Rings- Maximal Ideal – The field of quotients of an Integral domain – Euclidean Rings-Unique factorization Theorem.
Chapter:3 (Sec: 3.5, 3.6, 3.7)

TEXT BOOK:
1. I.N. Herstein [1989], "Topics in Algebra", [2nd ed] Wiley Eastern Ltd. New Delhi.
Chapter: 2 (Sec: 2.1 – 2.10 [Omit Applications 1 and 2 of 2.7]),
Chapter: 3 (Sec: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7)

REFERENCE BOOKS:
1. S. Arumugam [2004], "Modern Algebra", Sci. Tech Publications, Chennai.
2. J.B. Fraleigh [1987], "A First Course in Algebra", [3rd edition] Addison Wesley, Mass. [Indian Print]
3. Lloyd R. Jaisingh and Frank Ayres, Jr. [2005], "Abstract Algebra", [2nd edition], Tat McGraw Hill, New Delhi.
4. M.L. Santiago [2002], "Modern Algebra", Tat McGraw Hill, New Delhi
5. Surjeet Singh and Qazi Zameeruddin [1982], "Modern algebra", Vikas Publishing House Pvt. Ltd. New Delhi.

YEAR – III	**REAL ANALYSIS- I**	**MT510**
SEMESTER –V		**Hrs. / Week: 6**
CORE –XII	**For the students admitted from the year 2008**	**Credit: 4**

OBJECTIVES

To expose the students to the basics of real analysis and studying the notion of continuous functions and related theorems

COURSE OUTCOMES:

At the end of the course students will be able to

CO1: Define and recognize the basic properties of the field of real numbers.
CO2: Define and recognize the sequence and convergence of sequences.
CO3: Find the limit of wide class of sequences of real numbers
CO4: Decide on convergence or divergence of a wide class of series of real numbers.
CO5: Define and recognize continuity of real functions, open and closed sets.

SEMESTER V	COURSE CODE: MT510					COURSE TITLE: REAL ANALYSIS -I									HOURS 6	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	3	4	3	3	3	5	5	2	5	3	4	2	2	5	3.46
CO2	3	4	4	3	3	3	5	5	3	5	3	5	2	3	5	3.7
CO3	3	4	4	3	3	3	5	5	2	5	3	4	2	2	5	3.5
CO4	3	4	5	3	3	4	5	5	2	5	3	4	2	2	5	3.67
CO5	3	4	4	3	3	3	5	5	2	5	3	4	2	2	5	3.5
Mean Overall Score																3.56

Result: The Score of this Course is 3.56 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT – I: FUNCTIONS

Functions –Inverse function- Real valued function –Characteristic function - Equivalence - Countability and Real numbers- Least Upper Bound.

UNIT – II: SEQUENCES

Definition – Subsequences – Limit of Sequence – Convergent Sequence – Divergent Sequence – Bounded Sequence – Mono tone Sequence.

UNIT – III: SEQUENCES (Continued)

Operations on Convergent Sequence- Operations on Divergent Sequence – Limit Superior and Limit Inferior – Cauchy Sequence.

Series: Convergence and Divergence – Series with non-Negative terms – Alternating series – Conditional Convergence and Absolute Convergence.

UNIT –IV: SERIES (Continued)

Rearrangement of Series – Tests for Absolute Convergence – Series whose terms form a non-increasing Sequence – Summation of Parts.

Limits and Metric spaces: Limit of a Function of the Real Line – Metric Spaces – Limits in Metric Spaces.

UNIT – V: CONTINUOUS FUNCTIONS ON METRIC SPACES

Functions Continuous at a point on the real line – Reformulation – Functions Continuous on a Metric Spaces – Open sets – Closed Sets.

TEXT BOOK:

1. R. Goldberg [2000], "Methods of Real Analysis", Oxford & IBH Publishing Co., New Delhi.

Unit-I: Chapter: 1(1.3 - 1.7),
Unit-II: Chapter: 2 (2.1-2.6),
Unit-III: Chapter: 2, 3 (2.7-2.10, 3.1-3.4),
Unit-IV: Chapter: 3, 4 (3.5 -3.8, 4.1-4.3),
Unit-V: Chapter: 5(5.1 -5.5)

REFERENCE BOOKS:

1. Tom M. Apostol [1974]. Mathematical Analysis, 2nd Edition, Addison – Wesley, New York.
2. Bartle, R.G. and Shebert [1976], "Real Analysis", John Willy & Sons Inc., New York.
3. Malik, S.C and Savitha Arora [1991], "Mathematical Analysis", Willy Eastern Ltd, New Delhi.

YEAR – III	COMPLEX ANALYSIS-I	MT511A
SEMESTER –V	For the students admitted from the year 2020	Hrs. / Week: 5
CORE –XIII		Credit: 4

OBJECTIVES:

The course aims to introduce the concepts of complex numbers, functions of complex variables, limits and continuity, Cauchy Riemann equations and analytic functions, elementary functions, Definite integrals of functions.

COURSE OUTCOMES:

At the end of the course students will be able to

CO1: Analyze and solve problems using complex numbers.

CO2: Knowledge pertaining to functions of complex variables, limits and continuity.

CO3: Analyze and solve problems using Cauchy Riemann equations and analytic functions.

CO4: Knowledge pertaining to elementary functions.

CO5: Analyze and solve problems using Definite integrals of functions.

SEMESTER V	COURSE CODE: MT511A					COURSE TITLE: COMPLEX ANALYSIS-I									HOURS 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	4	3	5	4	3	4	4	3	4	3	5	4	3	4	3.8
CO2	4	3	4	5	4	3	3	4	3	4	3	5	4	3	4	3.7
CO3	3	4	3	5	4	3	4	4	3	4	3	4	5	3	4	3.7
CO4	4	4	3	5	5	3	4	4	3	4	3	4	5	4	5	4.0
CO5	3	4	4	5	5	3	3	4	3	4	3	4	4	4	5	3.9
Mean Overall Score																3.8

Result: The Score of this Course is 3.8 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT- I:

Regions in the complex plane- Functions of a Complex variable – Mappings- Mapping by the exponential function– Limits – Theorems on Limits – Limits involving the point at infinity

UNIT- II:

Continuity – Derivatives –Differentiation formulas- Cauchy-Riemann Equations-Sufficient Conditions for Differentiability-Polar Coordinates-

UNIT- III:

Analytic Functions-Examples-Harmonic Functions-Uniquely Determined Analytic Functions-Reflection Principle.

UNIT- IV:

The Exponential Function-The Logarithmic Function-Branches and Derivatives of Logarithms-Trigonometric Functions-Hyperbolic Function. Inverse Trigonometric and Hyperbolic function

UNIT- V:

Derivatives of Functions w(t)- Definite Integrals of Functions w(t)- Contours- Contour Integrals-Some Examples-Upper Bounds for Moduli of Contour Integrals- Antiderivatives-Proof of The Theorem-Cauchy-Goursat' Theorem- Proof of The Theorem (omit proof of the lemma).

TEXT BOOK:

1. Complex Variables and Applications, James Ward Brown, R. V. Churchill, McGraw – Hill International Edition (2009).

Unit-I: Chapter-1 (sec: 11), Chapter-2 (Sec: 12 -17)
Unit-II: Chapter-2 (Sec: 18 -23),
Unit-III: Chapter-2 (Sec: 24-28),
Unit-IV: Chapter-3 (Sec: 29-36),
Unit-V: Chapter-4 (Sec: 37-47).

REFERENCE BOOKS:

1. Functions of a Complex Variable", J.K. Goyal, K.P. Gupta (18^{th} Revised), Enlarged Edition 2004, Pragathi Prakashan Publishers, Meerut, UP.
2. P. Duraipandian and Laxmi Duraipandian (1976), "Complex Analysis", Emerald Publishers, Chennai.
3. S. Ponnusamy (2000), "Foundations of Complex Analysis", Narosa Publishing House, New Delhi.
4. Murray R. Spiegel (2005), "Theory and Problems of Complex Variable", Tata-McGraw Hill. Edition, New Delhi

YEAR – III	MECHANICS	EMT512A
SEMESTER –V	For the students admitted from the year 2020	Hrs. / Week: 5
ELECTIVE-I		Credit: 4

OBJECTIVES:

The course aims to introduce the concept of type of forces, magnitude and direction, kinematics, projectiles, central orbital, momentum of inertia.

COURSE OUTCOMES:

At the end of the course students will be able to

CO1: Analyze and solve problems of types of forces and resultant of the force.

CO2: Knowledge pertaining to kinematics and work, power, energy and Simple Harmonic mean.

CO3: Analyze and solving problems using projectiles.

CO4: Knowledge pertaining to solve problems using central orbit.

CO5: Analyze and solving problems about momentum of inertia.

SEMESTER V	COURSE CODE EMT512A					COURSE TITLE: MECHANICS									HOURS 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	4	3	5	4	3	4	4	3	4	3	5	4	3	4	3.8
CO2	4	3	4	5	4	3	3	4	3	4	3	5	4	3	4	3.7
CO3	3	4	3	5	4	3	4	4	3	4	3	4	5	3	4	3.7
CO4	4	4	3	5	5	3	4	4	3	4	3	4	5	4	5	4.0
CO5	3	4	4	5	5	3	3	4	3	4	3	4	4	4	5	3.9
Mean Overall Score																3.8

Result: The Score of this Course is 3.8 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT-I FORCE:
Types of Forces- Magnitude and direction of the resultant of the force acting on a particle – Triangle law of Force –Lami's Theorem.

UNIT-II KINEMATICS:
Work, Power, Energy, Principle of Work and Energy. Rectilinear motion with uniform acceleration. Simple Harmonic Motion.
Velocity and Acceleration Components in Co-planar motion along
[a] Two fixed perpendicular directions,
[b] Tangential and Normal Directions,
[c] Radial and Transverse directions (in polar co-ordinates).

UNIT-III PROJECTILES
Motion of the Projectile, nature of Trajectory, Result Pertaining to the motion of the projectile, range on an inclined plane.

UNIT-IV CENTRAL ORBIT
Central Forces and Central Orbit, Equation of Central orbit, Finding Law of Force and Speed of a given orbit, finding the orbit given the Law of Force.

UNIT-V MOMENTUM OF INERTIA
Momentum of Inertia of Simple Body, Theorems of Parallel and Perpendicular Axis, Momentum of Inertia Triangular Lamina, Circular Lamina, Circular Ring, Right Circular Cone, Sphere. (Solid and Hollow)

TEXT BOOK:
1. P. Duraipandian, Lakshmi Duraipandian and Muthamizh Jayapragasam [2012] "Mechanics", Revised Edition, S. Chand & Co, New Delhi.

Unit-I: Chapter-2 & 3 (sec: 2.1-2.2), and 3.2-3.4
Unit-II: Chapter-1 (Sec: 1.4-1.4.1), Chapter 11(sec 11.1-11.3) Chapter- 12(12.1-12.1.2)
Unit-III: Chapter-13 (Sec: 13.1,13.1-13.1.3,4-6,13.2,13.2.1),
Unit-IV: Chapter-16 (Sec:16.1,16.2,16.2.1,16.2.2,16.2.3,16.3),
Unit-V: Chapter-17 (Sec:17.1-17.1.1).

REFERENCE BOOKS:
1. A.V. Dharmapadam [1991], "Mechanics", S. Viswanathan and Co. Chennai.
2. S.L. Loney [1982], "Elements of Dynamics", Macmillan India, Delhi.
3. M.K. Venkataraman [1990], "Dynamics", Agasthier Book Depot, Trichy- 1.
4. P.N. Chatterjee [1992], "Dynamics", A Rajhans Publication, (19th Ed).
5. Joseph F.Shelley [2005], "Vector Mechanics for Engineers Vol-I: Dynamics", Tata McGraw Hill Edition, New Delhi.

YEAR – III	SPECIAL FUNCTIONS	EMT512A1
SEMESTER –V	For the students admitted from the year 2017	Hrs. / Week: 5
ELECTIVE –I		Credit: 4

OBJECTIVES:

To develop computational skill in certain special functions which are frequently occurring in higher mathematics and mathematical physics.

COURSE OUTCOMES:

At the end of the course students will be able to

CO1: Analyze the properties of linear operators and solve simultaneous linear differential equations.

CO2: Solve types of non-linear equations and numerical solutions using Taylors Series.

CO3: Analyze extrapolating data using differences properties of power series.

CO4: Solve second order differential equations.

CO5: Solve Bessel's function and Legendre function.

SEMESTER V	COURSE CODE: EMT512A1					COURSE TITLE: SPECIAL FUNCTIONS										HOURS 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10		
CO1	3	4	4	3	3	5	4	4	2	4	3	4	3	3	5	3.6	
CO2	3	4	4	3	2	5	5	4	2	5	3	4	3	2	4	3.5	
CO3	3	4	4	3	3	5	4	4	2	5	3	4	4	3	4	3.67	
CO4	3	4	4	3	3	5	4	4	3	5	3	4	3	2	4	3.6	
CO5	3	4	4	4	3	4	4	4	2	5	3	4	3	3	4	3.6	
Mean Overall Score																3.59	

Result: The Score of this Course is 3.59 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT-I:

Properties of Linear Operators - Simultaneous Linear Differential Equations - Special Solvable Types of Nonlinear Equations.

UNIT-II:

Numerical Solutions Using Taylor Series - Adams and Modified Adams Method - Extrapolation with Differences

UNIT-III:

Properties of Power Series - Examples - Singular Points of Linear Second Order Differential Equations - Method of Frobenius.

UNIT-IV:

Bessel Functions - Properties - Legendre Functions.

UNIT-V:

Term by Term Differentiation of Fourier Series, Legendre Series - Fourier Integral

TEXT BOOK:

1. F.B. Hildebrand. (1977) Advanced Calculus for Applications. Prentice Hall. New Jersey.

REFERENCE BOOKS:

1. J.N. Sharma and R.K. Gupta (1998) Special Functions, Krishna Prakashan Mandir, Meerut.
2. SatyaPrakash. (2004) Mathematical Physics. Sultan & Sons. New Delhi.
3. 3. B.D. Gupta (1978) Mathematical Physics, Vikas Publishing House.

YEAR – III	MATLAB	EMT513S
SEMESTER –V	For the students admitted from the year 2014	Hrs / Week: 4
ELECTIVE-II		Credit: 3

OBJECTIVE:
To expose the students to the basics of MATLAB windows, Operations in MATLAB, Loops and Polynomials and ordinary differential equation using MATLAB.

COURSE OUTCOMES:
At the end of the course
CO1: Students able to know the basics to know MATLAB and how to work on it.
CO2: Students able to do the programs based on operations.
CO3: Students able to know the Loops and how to work on it.
CO4: Students able to study the basics to polynomials used in MATLAB
CO5: Students able to solve equations and ordinary differential equations.

SEMESTER V	COURSE CODE: EMT513S					COURSE TITLE: MATLAB									HOURS 4	CREDITS 3
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	4	3	5	4	3	5	4	3	4	3	4	2	4	4	3.6
CO2	3	3	3	4	5	2	5	4	2	3	3	4	2	3	4	3.2
CO3	4	3	2	3	2	3	4	5	2	3	4	5	3	2	3	3.2
CO4	4	4	4	2	3	4	5	3	4	3	2	4	3	5	2	3.3
CO5	4	5	3	2	2	3	5	3	3	3	5	5	2	3	3	3.4
Mean Overall Score																3.34

Result: The Score of this Course is 3.34 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with programme outcomes and programme specific outcomes

UNIT – I STARTING WITH MATLAB, CREATING ARRAYS

Starting with MATLAB, MATLAB Windows – Working in the Command windows – Arithmetic Operations with Scalars – Display formats – Elementary Math Bult in functions – Defining Scalar Variable – Creating one dimensional array and creating two dimensional arrays.

UNIT – II MATHEMATICAL OPERATIONS WITH ARRAYS

Addition and Subtraction – Array Multiplication – Array Division – Element by Element Operation – Using Arrays in MATLAB – Built in Math Function – Built in Functions for Analyzing Arrays.

UNIT – III PROGRAMMING IN MATLAB

Relational operator and Logical operator – Conditional Statement – The Switch Statement – Loops – Nested Loop and Nested Conditional Statement – The Break and Continue Commands.

UNIT – IV POLYNOMIALS, CURVE FITTING AND INTERPOLATION

Polynomials – Curve fitting – Interpolation – The Basic fitting Interface.

UNIT – V APPLICATION IN NUMERICAL ANALYSIS

Solving an Equation with one variable – Finding a Maximum or a Minimum of a function – Numerical Integration – Ordinary Differential Equation.

TEXT BOOK:

1. "MATLAB an Introduction with Applications" by AMOS GILAT – John Wiley& sons, INC Publication. 2004.
   Chapter 1: 1.1 – 1.6, Chapter 2: 2.1 – 2.2, Chapter 3: 3.1 – 3.6
   Chapter 7: 7.1 – 7.6, Chapter 8: 8.1 – 8.4, Chapter 10: 10.1 – 10.4

REFERENCE BOOK:

1. "MATLAB Programming" by Y. Kirani Singh and B.B. Chaudhuri- PHI Learning Private Limited, New Delhi. Year: 2010.

YEAR – III	**PROGRAMMING IN MATLAB**	**MTP501**
SEMESTER –V	**For the students admitted from the year 2014**	**Hrs./ Week: 2**
ELECTIVE(PRACTICAL)		**Credit: 2**

The following exercise shall be performed as minimum mandatory requirements [for eligibility to take the practical examination] and a RECORD of the code-listing and outputs shall be maintained by each student.

1. Matrix Manipulation.
2. To Solve the System of Linear Equations
3. To Solve the Quadratic Equations
4. To Check for Palindrome
5. To Generate Fibonacci Number
6. To Find the Binomial Coefficient
7. 2D and 3D Graphs
8. Sub Plots
9. Trapezoidal Rule
10. Differentiation

REFERENCE BOOKS:

1. "MATLAB an Introduction with Applications" by AMOS GILAT – John Wiley& sons, INC Publication. 2004.
2. "MATLAB Programming" by Y. Kirani Singh and B.B. Chaudhuri- PHI Learning Private Limited, New Delhi. Year: 2010.

YEAR-III	**THEORY OF FUZZY NUMBER SYSTEM**	**EMT513A**
SEMESTER – V	**(Optional Paper)**	**HRS/WK –6**
ELECTIVE-II (OPTIONAL)	**For the students admitted from the year 2015**	**CREDIT – 5**

OBJECTIVES:

To get formalized with fuzzy principles and appreciate its nuances by constricting with crisp set and principles

COURSE OUTCOMES:

At the end of the course students will be able to

CO1: Provides knowledge on the basic definitions and fundamentals of Fuzzy set theory.

CO2: Able to understand idea on Fuzzy graphs and its properties

CO3: Improves their ability in the concept of Fuzzy relations in real life situations

CO4: Attains knowledge of the Fuzzy Logic in different forms

CO5: understands the applications of Fuzzy logic in day to needs

SEMESTER: V	COURSE CODE: EMT513A					COURSE TITLE: THEORY OF FUZZY NUMBER SYSTEM										HOURS 6	CREDITS 5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10		
CO1	4	3	3	4	4	4	3	3	4	3	4	3	3	3	4	3.5	
CO2	4	3	4	4	3	4	3	4	3	4	4	3	3	4	3	3.5	
CO3	3	3	4	3	4	3	4	3	3	4	3	3	4	4	4	3.5	
CO4	3	4	3	3	3	4	3	4	3	3	3	4	3	4	4	3.4	
CO5	4	4	4	4	3	4	3	4	4	3	4	4	3	3	3	3.6	
Mean Overall Score																3.5	

Result: The Score of this Course is 3.5 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT- I

Introduction-The need of fuzzy approach Crisp sets- Set of properties and operations-Fuzzy subsets – Membership Values –Fuzzy subset operations-Difference between fuzzy subsets and Crisp Sets. Relations-Mapping –Fuzzy Relations-Important Properties- Composition of two fuzzy relations- Variation between ordinary relation and Fuzzy relation. Logic-Fuzzy logic and the difference.

UNIT-II

Matrices-Matrix types and Operations-Neurons-Neural Networks-Synoptic Models-Relation Repration in matrix form-Fuzzy casual relation and its representation in matrix format-Simple Application

UNIT-III

Different Fuzzy Model –Bidirectional Associative Memories (BAM)-Fuzzy Cognitive Maps (FCM) and its Variations.

UNIT-IV

Fuzzy Relational Map (FRM) and its Variation –Their induced Model. Simple Applications

UNIT-V

Graphs –Fuzzy Graphs-Simple Applications-Numbers-Fuzzy Numbers-Different types of Fuzzy numbers- simple Application.

TEXT BOOKS:

1. A. Kaufmann “Introduction to the Theory of fuzzy subsets, Academic pres, INC, Newyork.-1975
   Unit-I: Chapter I (Sec-1-9) Chap-2(sec-12-17,19-26)
   Unit-II: Chap-3:(Page-191-264)
2. Bart Kosko, Neural Networks and Fuzzy System, Printice –Hall, INC, New jersey,1992
   Unit II: Chapter 2. Chapter 8:299-308
   Unit-III and IV chapter 3 (pg. No 79-84), Chapter 4 (pg. No 152-158) and Chapter 8 (pg. No 299-307)
3. Neural Networks and Fuzzy systems: A Dynamical Systems Approach to Machine Intelligence –Bart Kosko, Prentice Hall, New Jersey, 1992
   Unit V: Chapter 2 (pg. No: 19-70) Chapter 3 (pg. No 108-111, 120-123)
4. Fuzzy Graphs And Fuzzy Hypergraphs – John N. Mordeson, Premchand S. Nair, Physica- Verlag, Springer Verlag Publisher, USA,2000
   Unit V Chapter :2 (pg. No: 45-73) and Chapter 5 (pg. No 127-142).
5. Fuzzy Sets and Fuzzy Logic: Theory and Application-George J Klir and Bo Yuan, Printice-Hall, INC New Jersey 2002
   Unit V: Chapter -4 Pg. No 97-117

REFERENCE BOOK:

1. Dr. Sudhir K. Pundir and Dr. Rimple Pundir, Fuzzy sets and their applications.

YEAR– III	**LINEAR ALGEBRA**	**MT614**
SEMESTER –VI	**For the students admitted from the year 2008**	**Hrs. / Week: 6**
CORE-XIV		**Credit: 5**

OBJECTIVES:
Continuations of Abstract Algebra, we study about Vector Spaces and its linear equations.

COURSE OUTCOMES:
This paper will make the students to learn to convert Vector Spaces to Algebraic equations.
CO1: Beginning with Linear Dependence and Linear Independence on Vector Space
CO2: Knowing about Dual spaces and Inner product spaces on Vector space
CO3: Learning to study about Algebra of Linear transformations and its characteristic roots
CO4: Converting Linear equations of Vector space to Matrices its canonical and triangular forms
CO5: Deriving Trace and Transpose of Matrices.

SEMESTER VI	COURSE CODE: MT614					COURSE TITLE: LINEAR ALGEBRA									HOURS 6	CREDITS 5
COURSE OUTCOMES	PROGRAMME OUTCOMES					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	4	3	4	3	2	5	5	3	5	3	4	2	2	4	3.5
CO2	3	4	3	3	2	2	5	3	3	3	3	4	2	3	4	3.1
CO3	4	3	2	3	2	3	4	5	3	4	4	5	3	3	3	3.4
CO4	3	4	2	2	3	3	5	3	2	4	3	4	2	3	2	3.0
CO5	4	5	3	2	2	3	5	3	3	4	4	5	4	3	3	3.5
Mean Overall Score																3.3

Result: The Score of this Course is 3.3 (High)

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Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with programme outcomes and programme specific outcomes

UNIT - I: VECTOR SPACES

Basic concepts-Definition Vector space. Homomorphism. isomorphism, isomorphic-Linear dependence and independence-Bases—Linear Span-Examples and Problems.

UNIT – II: VECTOR SPACES (Continued)

Dual space – inner product spaces-norm of v- orthogonal- orthonormal-orthogonal complement-Gram-Schmitz orthogonalization theorem-examples and problems.

UNIT – III: LINEAR TRANSFORMATIONS

Algebra of linear transformations – Associative ring (Algebra)- linear transformation-invertible-right invertible-left invertible-range of T- rank of T- characteristics roots-characteristic vector-regular-singular-examples and problems.

UNIT – IV: LINEAR TRANSFORMATIONS (Continued)

Matrices- matrix of T- canonical forms- triangular forms-solving the matrices using given base set- finding the diagonal matrix-inverse of a matrix-similar matrix-invariant under T-examples and problems.

UNIT – V: LINEAR TRANSFORMATIONS (Continued)

Trace and Transpose-trace of T-matrix of T-transpose of a matrix-symmetric matrix-skew symmetric matrix-adjoint of a matrix- Determinant of a matrix-Cramer's rule-secular equation of A-examples and problems.

TEXT BOOK:

1. I.N. Herstein [1989], "Topics in Algebra", Wiley Eastern Ltd. New Delhi.
   Unit-I: Chapter-4: Sec-(4.1-4.2)
   Unit-II: Chapter-4: Sec-(4.3-4.4)
   Unit-III: Chapter-6: Sec-(6.1-6.2)
   Unit-IV: Chapter-6: Sec-(6.3-6.4)
   Unit-V: Chapter-6: Sec-(6.8 & 6.9)

REFERENCE BOOKS:

1. S. Arumugam. [2004], "Modern Algebra", Scitech Publications, Chennai.
2. J.B. Fraleigh [1987], "A First Course in Algebra", [3rd edition] Addison Wesley, Mass. [Indian Print]
3. Lloyd R. Jaisingh and Frank Ayres, Jr. [2005], "Abstract Algebra", [2nd edition], Tata McGraw Hill, New Delhi.
4. M.L. Santiago [2002], "Modern Algebra", Tata McGraw Hill, New Delhi
5. Surjeet Singh and Qazi Zameeruddin [1982], "Modern algebra", Vikas Publishing House. Pvt. Ltd. New Delhi.

YEAR – III	**REAL ANALYSIS-II**	**MT615**
SEMESTER –VI	**For the students admitted from the year 2008**	**Hrs. / Week: 6**
CORE-XV		**Credit: 5**

OBJECTIVE:
To develop the understanding of complete, compactness of sequence and series of functions, integration process of Riemann and to enhance the mathematical maturity and to work comfortably with concepts

COURSE OUTCOMES:
The students after undergoing this course will be able to
CO1: Describe open sets, connected sets and bounded sets
CO2: Learn completeness and compactness of metric spaces
CO3: Determine the Riemann integrability of a bounded function and prove a selection theorems concerning integration
CO4: Apply the mean value theorem and the Fundamental theorem of calculus to problems in the context of real analysis
CO5: Study Taylor's, Binomial theorem and L'Hospital rule and find solution to problems

SEMESTER VI	COURSE CODE: MT615					COURSE TITLE: REAL ANALYSIS-II									HOURS 6	CREDITS 5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	5	5	4	4	3	3	5	5	3	5	4	4	2	3	5	4.0
CO2	5	5	4	3	3	2	5	4	3	5	3	3	2	3	5	3.67
CO3	4	5	4	3	4	2	5	5	3	4	3	5	2	3	5	3.8
CO4	4	5	4	4	3	2	5	4	3	4	4	4	2	3	5	3.73
CO5	5	5	4	4	2	3	5	4	3	4	4	3	2	3	5	3.73
Mean Overall Score																3.79

Result: The Score of this Course is 3.79 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT – I: CONNECTEDNESS

More about Open Sets – Connected Sets –Bounded Sets and Totally Bounded Sets.

UNIT –II: COMPLETENESS, COMPACTNESS

Complete Metric Spaces –Generalization of Nested Interval Theorem-Picard's fixed-point theorem- Compact Metric Space – Continuous Functions on Compact Metric Spaces – Continuity of Inverse Functions.

UNIT – III: RIEMANN INTEGRATION

Sets of measure zero- Upper sum and Lower sum- Definition of Riemann Integral – Properties of the Riemann Integral – Derivatives – Chain rule- Relationship between derivative of inverse function-Rolle's Theorem-Darboux property

UNIT – IV: IMPROPER RIEMANN INTEGRATION

The Law of the Mean – Application of law of mean-Generalized mean value theorem-Fundamental Theorem of Calculus – Improper Integrals – Cauchy's Principle Value.

UNIT –V: TAYLOR'S THEOREM

Taylor's Theorem: Taylor's Formula with Different Forms of Remainder – The Binomial Theorem - L' Hospital Rule- Simple problems.

TEXT BOOK:

1. R. Goldberg. [2000] Methods of Real Analysis. Oxford & IBH Publishing Co., New Delhi.

Unit: I Chap: 6(Sec: 6.1-6.4)
Unit-II: Chap: 6 (Sec: 6.4- 6.7)
Unit-III: Chap: 7 (Sec: 7.1-7.6(omit 7.3)
Unit-IV: Chap: 7(Sec: 7.7-7.10)
Unit-V: Chap: 8(Sec: 8.5-8.7)

REFERENCE BOOKS:

1. Tom M. Apostol [1974]. Mathematical Analysis, 2nd Edition, Addison – Wesley, New York.

2. Bartle, R.G. and Shebert [1976] Real Analysis, John Willy & Sons Inc., New York.

3. Malik, S.C and Savitha Arora [1991] Mathematical Analysis Willy Eastern Ltd, New Delhi.

YEAR – III	**COMPLEX ANALYSIS-II**	**MT616**
SEMESTER –VI	**For the students admitted from the year 2008**	**Hrs. / Week: 6**
CORE-XVI		**Credit: 5**

OBJECTIVES:

The course aims to introduce the concepts of connected domains Liouville's theorem, convergence sequence and series along with Taylor's and Laurent's series, Cauchy, improper and definite integrals, linear transformations and conformal mapping.

COURSE OUTCOMES:

At the end of the course students will be able to

CO1: Analyze and solve problems using connected domains Liouville's theorem.

CO2: Knowledge pertaining to convergence sequence and series along with Taylor's and Laurent's series.

CO3: Analyze and solve problems using Cauchy Residue theorems and types of singular points.

CO4: Knowledge pertaining to improper and definite integrals involving sines and Cosines.

CO5: Analyze and solve problems using linear transformations and conformal mapping.

SEMESTER VI	COURSE CODE: MT616					COURSE TITLE: COMPLEX ANALYSIS-II									HOURS 6	CREDITS 5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	5	3	3	4	3	5	4	3	4	3	4	3	3	5	3.7
CO2	4	5	3	4	4	4	5	4	3	4	3	4	3	4	4	3.9
CO3	3	4	3	5	4	3	5	4	3	4	3	3	4	3	5	3.7
CO4	4	5	4	4	3	4	5	3	3	4	4	3	4	3	4	3.8
CO5	3	5	4	3	4	3	5	4	3	4	3	5	4	3	4	3.8
Mean Overall Score																3.8

Result: The Score of this Course is 3.8 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT- I:

Simply connected domains – Multiply connected domains – Cauchy integral's formula – An extension of Cauchy integral's formula – Some consequences of the extension– Liouville's theorem and the fundamental theorem of Algebra – Maximum modulus principle.

UNIT- II:

Convergence of sequences – Convergence of series – Taylors Series – Proof of Taylor's theorem – Examples – Laurent Series – Proof of Laurent's Theorem – Examples – Uniqueness of Series representations.

UNIT -III:

Isolated singular points – Residues – Cauchy's Residue Theorem – Residue at infinity– The three types of isolated singular points – Residues at poles – Examples – Zeros of an analytic function – Zeros and poles.

UNIT -IV:

Evaluation of improper integrals – Examples – Improper integrals from Fourier Analysis – Jordan' s lemma – Definite integrals involving sines and cosines – Argument principle – Rouche's Theorem.

UNIT V:

Linear transformations – The transformation w = 1/z - Linear fractional transformations – implicit form – Mappings of the upper half plane (Omit examples) Conformal mapping: Preservation of angles

TEXT BOOK:

1."Complex Variables and Applications", James Ward Brown, Ruel V. Churchill, McGraw – Hill International Edition (2009).

Unit-I: Chap:4 (Sec:4.48-4.54)
Unit-II: Chap:5(Sec: 5.55-5.62,5.66),
Unit-III: Chap:6(Sec:6.68-6.76)
Unit-IV: Chap:7(Sec:7.78-7.81,7.85-7.87)
Unit-V: Chap:8(Sec:8.90-8.95), Chap:9(Sec:9.101)

REFERENCE BOOKS:

1. Functions of a complex variable, J.K. Goyal, K.P. Gupta (18th Revised), Enlarged Edition 2004, Pragathi Prakashan Publishers, Meerut, UP.
2. P. Duraipandian and Laxmi Duraipandian (1976), Complex Analysis, Emerald Publishers, Chennai.
3. S. Ponnusamy (2000) Foundations of Complex Analysis, Narosa Publishing House, New Delhi.
4. Murray R. Spiegel (2005), Theory and Problems of Complex Variable, Tata-McGraw Hill Edition, New Delhi.

YEAR – III	**PROGRAMMING IN C LANGUAGE**	**EMT617S**
SEMESTER –VI	**For the students admitted from the year 2014**	**Hrs. / Week: 4**
ELECTIVE-III		**Credit: 2**

OBJECTIVE:

To make the students abreast with the programming concepts and to master them in C Language.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Knowledge pertaining to C-Language Fundamentals

CO2: Logic using Control Statements

CO3: Modular Programming using Functions

CO4: Knowledge pertaining to arrays and structures.

CO5: Advanced Programming techniques using pointers and files concepts.

SEMESTER VI	COURSE CODE: EMT617S					COURSE TITLE: PROGRAMMING IN C LANGUAGE									HOURS: 4	CREDITS 2
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	4	3	5	4	3	4	4	3	4	3	5	4	3	4	3.8
CO2	4	3	4	5	4	3	3	4	3	4	3	5	4	3	4	3.7
CO3	3	4	3	5	4	3	4	4	3	4	3	4	5	3	4	3.7
CO4	4	4	3	5	5	3	4	4	3	4	3	4	5	4	5	4.0
CO5	3	4	4	5	5	3	3	4	3	4	3	4	4	4	5	3.9
Mean Overall Score																3.8

Result: The Score of this Course is 3.8 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT –I: OVERVIEW OF C

Basic Structure of C Programs- Programming style- Executing a 'C' Programs –'c' Tokens-Keywords and Identifiers.

UNIT – II: CONSTANTS, VARIABLES & DATA TYPE

Constants-Variables-Data Types- Declaration of Variables- Declaration of Storage Class-Assigning values to variables.

UNIT – III: OPERATORS AND EXPRESSION

Arithmetic Operators-Relational operators- Logical operators - Assignment operators - Increment and decrement operators-Conditional operators -Bitwise operators -Evaluation of Expressions-Precedence of Arithmetic operators.

UNIT –IV: FORMATTED INPUT, OUTPUT & DECISION MAKING AND BRANCHING

Formatted input- Formatted output- Decision making with 'IF' statement- Simple IF statement- The IF ELSE statement-Nesting of IF…ELSE statement-The ELSE IF ladder-The switch statement – The ?: Operators- The GOTO statement.

UNIT – V: DECISION MAKING AND LOOPING & ARRAYS

The WHILE statement-The DO statement-The FOR statement- Jumps in LOOPS-One dimensional array-Declaration of one dimensional arrays-Initialization of one dimensional arrays-Two dimensional arrays-Multi dimensional arrays.

TEXT BOOK:

1. E. Balagurusamy [1996], "Programming in ANSI C" .Tata McGraw Hill.
   Unit: I Chap:1(1.8-1.10), Chap:2 (2.3,2.4)
   Unit: II Chap:2 (2.5-2.10),
   Unit: III Chap: 3 (3.2-3.12),
   Unit- IV Chap:4 (4.4,4.5), Chap:5 (5.2-5.9),
   Unit: V Chap:6 (6.2-6.5), Chap:7(7.2-7.7)

REFERENCE BOOKS:

1. V. Rajaraman [1995], "Computer Programming In C", Prentice Hall. New Delhi.
2. H. Schildt, Obsborne (1994), "Teach Yourself C", McGraw Hill, New York, Mullish Cooper.
3. "The Spirit of C – An Introduction to Modern Programming", Jaico Publishing House. Delhi. 1998.
4. Yashavant Kanetkar, "Let Us C", 6th edition BPB publication.

YEAR – III	**PRACTICAL: PROGRAMMING IN C LANGUAGE** **For the students admitted from the year 2014**	**MTP601**
SEMESTER –VI		**Hrs / Week: 2**
ELECTIVE(PRACTICAL)		**Credit: 2**

The following exercise shall be performed as minimum mandatory requirements [for eligibility to take the practical examination] and a RECORD of the code-listing and outputs shall be maintained by each student.

1. Assigning the ASCII value.
2. Square of numbers: Using For loop,
3. Square of numbers :While loop
4. Square of numbers: Do- while loop,
5. Square of numbers :Go to statement.
6. Printing Alphabets between two letter
7. Counting Vowels and consonants.
8. Printing Prime number between two numbers
9. Fibonacci series
10. Factorial numbers
11. Power of a value
12. Checking Palindrome in string
13. Sin(X) series
14. Cos(X) series
15. Pascal Triangle
16. Binary search
17. Matrix Transpose
18. Matrix Addition
19. Matrix Subtraction
20. Matrix Multiplication

REFERENCE BOOKS:

1. "The spirit if C", Mulish Cooper, Indian edition by jaico pubishers, 1987.
2. "Teach yourself C", Herbert Scheldt, McGraw-Hill, 2nd edition 1994 Programming in C-Schaum series.

YEAR – III	**MATHEMATICAL MODELING**	**EMT617A1**
SEMESTER –VI	**(Optional Paper)**	**Hrs / Week: 4**
ELECTIVE-III (OPTIONAL)	**For the students admitted from the year 2017**	**Credit: 3**

OBJECTIVE:
To achieve a broad understanding of the objectives of mathematical modelling within the physical sciences

COURSE OUTCOMES:
The students after undergoing this course will be able to
CO1: Describe standard modeling procedures, which involve observations of a natural system using first order O.D.E
CO2: Learn to use modelling in various fields like population, economics and medicine using system of O.D.E
CO3: Analyze and apply mathematical modelling for miscellaneous model
CO4: Study mathematical modelling through Difference equation
CO5: Analyze and draw modelling through Graphs

SEMESTER VI	COURSE CODE: EMT617A1					COURSE TITLE: MATHEMATICAL MODELING									HOURS 4	CREDITS 3
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	4	4	4	3	4	4	4	4	2	4	4	5	3	4	3.7
CO2	4	3	4	3	3	4	4	3	4	2	4	4	5	3	4	3.6
CO3	4	3	4	2	2	4	4	3	4	2	3	4	4	3	4	3.3
CO4	4	4	4	2	3	4	4	3	3	2	3	4	3	3	4	3.3
CO5	5	3	4	2	3	4	4	3	3	2	5	4	5	3	4	3.6
						Mean Overall Score										3.5

Result: The Score of this Course is 3.5 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT- I

Mathematical Modelling through Ordinary Differential Equations of First order: Linear Growth and Decay Models – Non-Linear Growth and Decay Models – Compartment Models – Dynamic problems – Geometrical problems.

UNIT -II

Mathematical Modelling through Systems of Ordinary Differential Equations of First Order: Population Dynamics – Epidemics – Compartment Models – Economics – Medicine, Arms Race, Battles and International Trade – Dynamics.

UNIT -III

Mathematical Modelling through Ordinary Differential Equations of Second Order: Planetary Motions – Circular Motion and Motion of Satellites – Mathematical Modelling through Linear Differential Equations of Second Order – Miscellaneous Mathematical Models.

UNIT -IV

Mathematical Modelling through Difference Equations: Simple Models – Basic Theory of Linear Difference Equations with Constant Coefficients – Economics and Finance – Population Dynamics and Genetics – Probability Theory.

UNIT -V

Mathematical Modelling through Graphs: Solutions that can be Modeled Through Graphs – Mathematical Modelling in Terms of Directed Graphs, Signed Graphs, Weighted Digraphs and Unoriented Graphs.

TEXT BOOK:

1. J.N. Kapur, Mathematical Modelling, Wiley Eastern Limited, New Delhi, 1988.

REFERENCE BOOK:

1. J.N. Kapur, Mathematical Models in biology and Medicine, EWP, New Delhi, 1985.

YEAR – III	OPERATIONS RESEARCH	EMT618A
SEMESTER –VI	For the students admitted	Hrs. / Week: 6
ELECTIVE-IV	from the year 2020	Credit: 4

OBJECTIVES

The course aim is to introduce linear programming, transportation methods, assignment models, sequencing problem, game theory and network analysis in project planning.

COURSE OUTCOMES:

The students after undergoing this course will be able to

CO1: Use knowledge of operational research, LPP.

CO2: Formulate physical problems as operational research using assignment models.

CO3: Understand analogies between transportation problem, phenomena in operational Research.

CO4: Classify operational research, game theory, interpret the solutions.

CO5: Interpret solutions in network analysis.

SEMESTER VI	COURSE CODE: EMT618A					COURSE TITLE: OPERATIONAL RESEARCH									HOURS 6	CREDITS: 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	3	2	3	3	3	4	4	3	2	3	3	2	2	3	2.9
CO2	4	3	2	2	2	3	4	4	3	2	2	3	2	3	3	2.8
CO3	5	4	4	2	2	2	5	5	3	4	3	4	2	3	3	3.4
CO4	4	4	3	3	3	2	5	5	4	3	2	4	2	3	2	3.3
CO5	5	4	3	3	3	2	5	5	4	3	3	4	2	3	2	3.4
						Mean Overall Score										3.2

Result: The Score of this Course is 3.2 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with programme outcomes and programme specific outcomes.

UNIT - I: LINEAR PROGRAMMING

Definitions of OR - formulations of Linear programming problem - Graphical methods of solution - The simplex method - Artificial variables techniques - The Big-M method.

UNIT - II: TRANSPORTATION METHODS

Definitions of the transportation model - Formulation and solution of transportation models - North-west corner rule - Least cost method - Vogel's approximation method - Solution of transportation - MODI method.

UNIT - III: ASSIGNMENT MODELS

Definition of Assignment models - Mathematical representation of assignment model- Solution of the assignment model - The Hungarian methods for solution of the assignment models –unbalanced assignment problem.

SEQUENCING PROBLEM

Sequencing problems – Johnson's Algorithm- processing 'n' jobs through two machines - processing 'n' jobs through three machines - processing two jobs through 'm' machines.

UNIT - IV: GAME THEORY

Definitions - Rules for game theory - Rule 1 look for a pure strategy - Rule 2 reduce game bydominance - Rule 3 Solve for mixed strategy - Mixed strategies (2x2 games) - Mixed strategies (2xn games & mx2 games) - mixed strategies (3x3 or higher games).

UNIT - V: NETWORK ANALYSIS

Basic tools and techniques of project managements - Network logic - Numbering the events - Activity on node diagram - Critical path method - Programme evaluation and review technique [PERT].

TEXT BOOK:

1. Prem Kumar Gupta, D.S. Hira [2008], "Operation Research's".
   Unit-I: 1.2, 2.2, 2.3, 2.10, 2.11, 2.11.1, 2.11.2,
   Unit-II: 3.2, 3.4
   Unit-III:4.1-4.6, 5.1, 5.4-5.7
   Unit-IV: 8.4.2 – 8.4.8
   Unit-V: 14.4-14.9.

REFERENCE BOOK:

1. Operation Research", Dr. S.J. Venkatesan, [2012], Sri Krishna Pubblications.

YEAR – III	**ASTRONOMY (Optional Paper)**	**EMT618A1**
SEMESTER –VI	**For the students admitted in the year 2017**	**Hrs / Week: 6**
ELECTIVE-IV (OPTIONAL)		**Credit: 4**

OBJECTIVE:

To expose the students to the basics of Spherical Trigonometry basics, Astronomical Refraction and Laws to know the Planets.

COURSE OUTCOMES:

The students after undergoing this course will be able to

CO1: Students able to know the basics in Spherical Trigonometry basics

CO2: Students able to understand about Earth.

CO3: Students able to know Astronomical Refraction.

CO4: Students able to study the basics of Laws.

CO5: Students able to know about Moon.

SEMESTER VI	COURSE CODE: EMT618A1					COURSE TITLE: ASTRONOMY									HOURS 6	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	4	5	4	4	2	5	4	3	4	3	4	2	2	4	3.5
CO2	3	3	3	4	2	3	5	4	2	3	3	4	2	3	4	3.1
CO3	4	3	2	3	2	3	4	5	2	3	4	5	3	2	3	3.2
CO4	3	4	4	2	3	2	5	3	4	3	4	4	3	4	2	3.1
CO5	4	5	3	2	3	3	4	3	3	3	5	5	2	3	3	3.4
Mean Overall Score																3.26

Result: The Score of this Course is 3.26 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with programme outcomes and programme specific outcomes.

UNIT-I:
Spherical Trigonometry- Celestial Sphere – Dinural motion – Simple Problems.

UNIT-II:
The Earth- Zones of Earth – Terrestial Latitudes and Longitudes – Rotation of Earth – Dip of the horizon – Twilight – Simple problems.

UNIT-III
Astronomical Refraction – Geocentric Parallax – Simple problems.

UNIT-IV
Kepler's Laws – simple problems, Equation of Time – Seasons – Calendar – Conversion of Time

UNIT-V
Moon: Different phases of moon – full moon – new moon – necessary and sufficient condition.

TEXT BOOK:
1. S. Kumaravelu and Susheela Kumaravelu (2004), "Astronomy", SKV Publishers, Nagarkoil.

REFERENCE BOOKS:
1. L.W. Frederick and R.H. Baker (1976), "Astronomy" (10th Ed.) Vas Nostrand, New York.
2. R. Jastrow and M.H. Thompson (1984), "Astronomy: Fundamentals and Frontiers", (4th Ed) John Wiley & Sons, New York.
3. H. Karttunen et. Al. (2003), "Fundamental Astronomy", (4th Ed) SpringerVerlag, Berlin.
4. L. Motz and A. Duveen (1977), "Essentials of Astronomy", (2nd Ed) Columbia University Press, New York.
5. G.V. Ramachandran (1965), "A Text Book of Astronomy", (5th Edition) Published by Mrs. Rukmani Ramachandran, Tiruchirappalli.
6. M. Zeilik (2002), "Astronomy: The Evolving Universe", (9th Edition) Cambridge University Press, Cambridge.

YEAR – I	ALLIED MATHEMATICS – I	21AMCS11
SEMESTER – I	For the students admitted from the year 2021	HRS/WK –8
ALLIED – I		CREDIT –6

(For B.Sc. Computer Science)

OBJECTIVES

This subject covers the topics Theory of equations, matrices, differential calculus, Integral calculus and vector analysis, to explore the fundamental concepts of Mathematics.

COURSE OUTCOMES:

The students after undergoing this course will be able to

CO1: Knowledge pertaining to polynomials equations in varies field.

CO2: Able to find solutions of transformation of equation by increasing or decreasing roots.

CO3: Knowledge pertaining to consistency of equations of matrices and Eigen roots and Eigen vectors.

CO4: Knowledge pertaining to expansions of $\sin\theta$, $\cos\theta$, $\tan\theta$ and Hyperbolic functions.

CO5: Knowledge pertaining to find solutions of nth- derivatives and radius of curvature.

SEMESTER I	COURSE CODE: 21AMCS11					COURSE TITLE: ALLIED MATHEMATICS – I									Hours 8	Credits 6
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	4	3	4	3	3	4	4	3	4	4	5	3	3	4	3.7
CO2	3	5	3	3	3	4	5	4	3	4	4	5	3	3	4	3.7
CO3	5	4	3	3	4	5	4	3	4	5	4	4	3	4	5	4.0
CO4	4	3	4	3	4	3	5	4	4	5	4	3	4	4	4	3.9
CO5	3	5	4	2	5	3	5	4	4	5	4	4	3	4	5	4.0
Mean Overall Score																3.9

Result: The Score of this Course is 3.9 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT-I: LOGIC

Symbolic logic –Arguments Test of Validity of the(using truth table),-Quantifiers (Without truth table)

UNIT-II: THEORY OF EQUATIONS

Transformation of equations by increasing or decreasing roots by a constant –Horner's Method to find a root approximately. (without proof)– Newton's method to find a root approximately two decimals places(without proof) .

UNIT-III: MATRICES

Eigen values and Eigen vectors – Cayley – Hamilton's theorem [without proof] – Verification and computation of inverse matrix using Cayley Hamilton theorem

UNIT-IV: TRIGONOMETRY

Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ – Expansions of $\sin\theta$, $\cos\theta$, $\tan\theta$ in terms of θ – Hyperbolic and inverse hyperbolic functions – Logarithms of complex numbers.

UNIT-V: DIFFERENTIAL CALCULUS

n^{th} derivatives – Leibnitz theorem [without proof] and its applications – Jacobians – Concepts of polar co-ordinates – Curvature and radius curvature in Cartesian and polar co-ordinates.

TEXT BOOKS:

1. "Mathematical Foundations" P.R. Vittal, Margham publications, Chennai.
2. Discrete Mathematics-Venkatraman M.K, Sridharan. N, Chandrasekaran. N, The National Publishing Company, Chennai, 2000
3. P. Duraipandian and S. Udayabaskaran. 2005, "Allied Mathematics", Vol I & II. Chennai: Muhil Publishers.
   Unit-I: chap1 (Pg:1.1-1.50) Chap:9(15 Pg:9.72-9.79)
   Unit-II: Chap:3(3.2.2,3.4.1,3.4.2), Unit-III: Chap:4(4.5,4.5.2,4.5.3),
   Unit-IV: Chap:6 (6.1,6.1.1-6.1.3,6.2,6.2.1-6.2.3,6.3,6.4),
   Unit-V: Chap:1(1.1.1,1.1.2,1.2,1.4.3,1.4).

REFERENCE BOOKS:

1. P. Balasubramanian and K. G. Subramanian. 1997, "Ancillary Mathematics", Vol I & II. New Delhi: Tata McGraw Hill.
2. S.P. Rajagopalan and R. Sattanathan 2005, "Allied Mathematics", Vol I & II. New Delhi: Vikas Publications.
3. P. R. Vittal (2003), "Allied Mathematics", Chennai: Marghan Publications.
4. P. Kandhasamy, K. Thilagavathy (2003), "Allied Mathematics", Vol I & II. New Delhi: S. Chand & Co Ltd.

YEAR – I	ALLIED MATHEMATICS – I For the students admitted from the year 2021	21AMT11
SEMESTER – I		HRS/WK –8
ALLIED- I		CREDIT –6

(For B.Sc. Physics & Chemistry)

Objectives:

1. To acquire knowledge on finding roots of the complex equation.
2. To improve their ability on applications of matrices and calculus.

COURSE OUTCOMES:

The students after undergoing this course will be able to

CO1: Attains knowledge on finding roots for polynomial, irrational, complex equations.

CO2: develops the skill of transformation, approximation and reciprocal on equations.

CO3: adopts techniques in solving problem involving Matrices

CO4: provides skills on finding curvature and radius of curvature in Cartesian and polar co-ordinates.

CO5: enables to understand the applications of integration in real life situation.

SEMESTER I	COURSE CODE: 21AMT11					COURSE TITLE ALLIED MATHEMATICS – I									HOURS 8	CREDITS 6
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	4	4	3	3	3	4	4	4	4	3	3	3	3	4	3.5
CO2	3	3	3	3	3	4	3	4	4	3	3	4	3	3	3	3.3
CO3	3	3	4	3	4	3	3	3	4	3	4	3	4	3	3	3.3
CO4	4	4	3	4	4	3	3	3	3	3	4	3	3	3	4	3.4
CO5	3	3	3	4	4	4	4	4	3	4	3	3	3	3	3	3.4
Mean Overall Score																3.4

Result: The Score of this Course is 3.4 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT-I: SOLUTIONS OF TRANSCENDENTAL AND ALGEBRAIC EQUATIONS

Iteration method**,** Bisection method, Newton's method - Regula Falsi method,Horner's method(without proof) (Simple problems only)

Unit-II: SOLUTIONS OF SIMULTANEOUS EQUATIONS

Gauss Elimination method- Gauss Jordan method-Gauss Seidel Iterative method-Gauss Jacobi method (Restricted to three variables only) (Simple problems only)

UNIT-III: MATRICES

Characteristic equation of a square matrix– Eigen values and eigen vectors – Cayley – Hamilton theorem [without proof] – Verification and computation of inverse matrix-

UNIT-IV: DIFFERENTIAL CALCULUS

n-th derivatives – Leibnitz theorem [without proof] and applications – Jacobians– Curvature and radius of curvature in Cartesian co-ordinates and polar co-ordinates.

UNIT-V: APPLICATION OF INTEGRATION

Evaluation of double, triple integrals – Simple applications to area, volume and centroid.

TEXT BOOKS:

1. A. Singaravelu "Numerical Methods" Meenakshi Publications
Unit-I: Chapter 2
Unit-II: Chapter 2
2. P. Duraipandian and Dr. S. Udayabaskaran. 1997, "Allied Mathematics", Vol I & II. Chennai: Muhil Publishers.
Unit-III: Volume-I- Sec (4.5, 4.5.2),
Unit-IV: Volume-II- Sec (1.1,1.1.1,1.1.2,1.2,1.4.3),
Unit-V: Volume-II-Chap:3 Sec (3.2,3.2.1,3.2.2,3.4,3.4.1,3.4.2,3.5,3.5.1,3.6)

REFERENCE BOOKS:

1. P. Balasubramanian and K. G. Subramanian. 1997, "Ancillary Mathematics", Vol I & II. New Delhi: Tata McGraw Hill.
2. S.P. Rajagopalan and R. Sattanathan (2005), "Allied Mathematics", Vol I & II. New Delhi: Vikas Publications.
3. P. R. Vittal (2003), "Allied Mathematics", Chennai: Marghan Publications.

I – BCA	MATHEMATICAL FOUNDATIONS	21AMCA11
SEMESTER – I	For the students admitted from the year 2021	HRS/WK – 5
ALLIED – 1		CREDIT – 5

(For B.C.A. I – Year)

OBJECTIVE:

To learn how to apply fundamental mathematical tools and techniques used in most fields of science and mathematics

COURSE OUTCOMES:

The students after undergoing this course will be able to

CO1: Understand operators and solve problems using operators

CO2: Know the concept of set theory, relation and function

CO3: Solve problems using permutation and combination

CO4: Understand more about matrices and solve problems using matrices

CO5: Learn characteristic roots and characteristic vectors and solve problems

SEMESTER I	COURSE CODE: 21AMCA11					COURSE TITLE: MATHEMATICAL FOUNDATION									HOURS 5	CREDITS 5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	3	3	3	4	4	4	4	3	3	5	3	3	1	4	3.4
CO2	3	4	3	4	3	4	5	4	3	4	3	3	3	2	5	3.5
CO3	4	3	4	3	3	3	4	4	3	3	4	5	3	1	5	3.47
CO4	5	5	4	5	4	3	4	5	3	3	3	5	3	2	4	3.87
CO5	4	5	4	3	4	4	5	4	3	3	3	3	3	1	5	3.6
Mean Overall Score																3.57

Result: The Score of this Course is 3.57 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT–I: LOGICAL OPERATORS

Conjunction, disjunction, negation, conditional and bi-conditional operators, converse, inverse, contra-positive, logically equivalent, tautology and contradiction, arguments and validity of arguments.

UNIT-II: SET THEORY

Set theory-Definitions, Types of sets, Operations on set theory, Relations - equivalence relation, partially ordered set, partition of set and Functions (Simple problems without theorems).

UNIT –III: PERMUTATION AND COMBINATION

Binary operations, types of binary operations, Permutation and Combination (simple problems).

UNIT –IV: MATRICES

Types of matrices, operations on matrices, simple problems, singular and non-singular matrices, adjoint of a matrix, inverse of a matrix, symmetric and skew-symmetric, Hermitian and skew-Hermitian, orthogonal and unitary matrices, Consistency of a system of linear equations using Rank method.

UNIT –V: MATRIX THEORY (CONTD….)

Characteristic roots and characteristic vectors, Cayley-Hamilton theorem - finding inverse of a square matrix and verification of Cayley-Hamilton theorem.

TEXT BOOK:

1.“Mathematical Foundations”, P.R. Vittal (2003), Margham Publications, Chennai.
Unit-I: Chapter 1 (Pages: 1.1 -1.50),
Unit-II: Chapter 2 &3&4 (Pages: 2.1- 2.38 &3.1 -3.25 & 4.1-4.35),
Unit-III: Chapter 6 & 7(Pages: 6.1 -6.10 & 7.1-7.53),
Unit-IV: Chapter 8 (Pages: 8.1 to 8.97),
Unit-V: Chapter 8 &9 (Pages: 8.97-8.140).

REFERENCE BOOKS:

1. **“**Discrete Mathematics”, Second edition, Seymour Lipschutz & Marc Lipson, Schaum’s outlines, Tata McGraw-Hill.
2. Discrete Mathematics, B.S. Vatssa, Wishwa Prakashan.

YEAR – I		AMCS22A
SEMESTER – II	**ALLIED MATHEMATICS – II**	**HRS/WK –8**
ALLIED – II	**For the students admitted from the year 2022**	**CREDIT –6**

(For B.Sc Computer Science)

OBJECTIVES

This subject covers the topics Laplace Transform, Vector differentiation & Integration, Finite Differences, to explore the fundamental concepts of Mathematics.

COURSE OUTCOME:

At the end of the course students will be able to

CO1: Find the solution using dominance property.

CO2: Solve Transportation Problem.

CO3: Find Perfect job allocation using Assignment Problem.

CO4: Compute scalar and vector product, gradient and curl of functions.

CO5: Find interpolating data using Lagrange and Newton's formula.

SEMESTER II	COURSE CODE: AMCS22A					COURSE TITLE: ALLIED MATHEMATICS -II									HOURS 8	CREDITS 6
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	4	4	3	3	3	5	4	2	4	4	4	3	2	4	3.47
CO2	3	4	4	3	3	3	5	4	2	4	4	4	3	2	4	3.47
CO3	3	4	4	3	3	3	5	5	2	4	4	4	3	2	4	3.5
CO4	3	4	4	3	3	3	5	4	2	4	4	4	3	2	4	3.47
CO5	3	4	4	3	3	3	5	5	2	4	4	5	3	2	4	3.6
Mean Overall Score																3.5

Result: The Score of this Course is 3.5 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT-I: GAME THEORY

Two Person Zero Sum Game-Basic Terms-Maximum and Minimum Principal-Games without Saddle points –Mixed Strategies-Graphical Solution of 2Xn and mX2 games-Dominance Property.

UNIT-II: TRANSPORTATION PROBLEM:

Definitions of the transportation model - Formulation and solution of transportation models - North-west corner rule - Least cost method - Vogel's approximation method- Modi's Method.

UNIT-III: ASSIGNMENT MODEL:

Definition of Assignment Model- Formulation and Solution of Assignment Model-Special Cases in Assignment Model- Hungarian Method.

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UNIT-IV: VECTOR DIFFERENTIATION

Scalar point functions-Vector point functions-Gradient-Divergence-Curl-Directional Derivatives-Unit to normal to a surface.

UNIT-V: FINITE DIFFERENCES

Operator E, Relation between Δ, ∇ and E – Interpolation – Newton – Gregory forward & backward formulae for interpolation-Lagrange's interpolation formula for unequal intervals (without proof).

TEXT BOOKS:

1. Dr. S.J Venkatesan (2018) "Operation Research" Sri Krishna Publication
2. P. Duraipandian and S. Udayabaskaran (1997), "Allied Mathematics", Vol I & II. Chennai. Muhil Publishers.

   Unit-I: Chapter 9: Page: 9.1-9.9, 9.19-9.28
   Unit- II& Unit III: Chapter 4: Page 4.1-4.28
   Unit-IV: Section (8.1,8.1.1,8.2,8.3,8.3.1,8.3.2,8.4,8.4.1,8.4.2,8.4.3,8.4.4),
   Unit-V: Section (5.1, 5.2)

REFERENCE BOOKS:

1. P. R. Vittal (2003), "Allied Mathematics", Chennai: Marghan Publications.
2. Gupta P. K and Hira D. S. [2000], "Problems in Operations Research", Sulthan Chand & Sons., Delhi.

YEAR – I	ALLIED MATHEMATICS – II For the students admitted from the year 2017	AMT202T
SEMESTER – II		HRS/WK –8
ALLIED- II		CREDIT –6

(For B.Sc. Physics & Chemistry)

OBJECTIVES:

To expand trigonometric functions, partial differential equations and learn about vector differentiations and integrations also too familiar with physical interpretation of divergence and curl of a vector

COURSE OUTCOMES:

The students after undergoing this course will be able to

CO1: Attains knowledge on finding the expansions of trigonometric and hyperbolic functions

CO2: provides a basic knowledge of Partial Differential equations and develops knowledge on handle practical problems.

CO3: adopts techniques in solving problems involving vector and scalar functions

CO4: provides skills on finding derivatives and gradients on vector differentiation and Integration.

CO5: enables to understand the applications of differentiation and integration in real life situation.

SEMESTER II	COURSE CODE: AMT202T					COURSE TITLE: ALLIED MATHEMATICS – II									HOURS: 8	CREDITS 6
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	3	4	3	3	4	4	3	4	4	3	4	3	3	3	3.5
CO2	4	4	4	3	4	3	4	3	3	3	4	3	3	4	4	3.5
CO3	3	3	3	4	4	4	3	3	4	3	3	3	4	3	4	3.4
CO4	3	3	3	4	3	3	3	3	3	4	3	3	3	3	3	3.1
CO5	4	4	4	3	3	3	3	3	4	3	3	3	3	4	4	3.4
Mean Overall Score																3.4

Result: The Score of this Course is 3.4 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT-I: TRIGONOMETRY

Expansions of $\sin^n\theta$, $\cos^n\theta$, $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ – Expansions of $\sin\theta$, $\cos\theta$, $\tan\theta$ in terms of θ – Hyperbolic and inverse hyperbolic functions – Logarithms of complex numbers.

UNIT-II: PARTIAL DIFFERENTIAL EQUATIONS

Formation-complete integrals and general integrals-Four standard types-Lagrange's equations.

UNIT-III: VECTOR DIFFRENTIATION

Vector functions- Derivative of a vector function- Scalar and vector point functions- Gradient of a scalar point function- Gradient- Directional derivatives –Unit vector normal to a surface – angle between the surfaces-divergence, curl.

UNIT-IV: VECTOR INTEGRATION

Green's theorem in the plane- Gauss divergence theorem- Stoke's theorem [without proofs].

UNIT-V: FINITE DIFFERENCES

Operator E, Relation between Δ, ∇ and E – Interpolation – Newton – Gregory forward & backward formulae for interpolation-Lagrange's interpolation formula for unequal intervals [without proof].

TEXT BOOK:

1.P. Duraipandian and S. Udayabaskaran (1997), "Allied Mathematics", Vol I & II. Chennai: Muhil Publishers.
Unit-I: Volume-I-Chap: 6 (6.1,6.1.1-6.1.3,6.2,6.2.1-6.2.3,6.3,6.4)
Unit-II: Volume-II-Chap:6 (6.1,6.1.1,6.2,6.3,6.4)
Unit-III: Volume-II Sec (8.1,8.1.1,8.2,8.3,8.3.1,8.3.2,8.4,8.4.1,8.4.2,8.4.3,8.4.4)
Unit-IV: Volume-II Sec (8.6.1, - 8.6.3)
Unit-V: Volume-I Sec (5.1,5.2)

REFERENCE BOOKS:

1. P. Balasubramanian and K. G. Subramanian. 1997, "Ancillary Mathematics", Vol I & II. New Delhi: Tata McGraw Hill.
2. S.P. Rajagopalan and R. Sattanathan (2005), "Allied Mathematics", Vol I & II. New Delhi: Vikas Publications.
3. P. R. Vittal (2003), "Allied Mathematics", Chennai: Marghan Publications.
4. P. Kandhasamy, K. Thilagavathy (2003), "Allied Mathematics" Vol I & II, New Delhi: Tata McGraw Hill.

II – BCA		**AMTCA302**
SEMESTER - III	**NUMERICAL METHODS**	**HRS/WK – 5**
Allied-II	**For the students admitted in the year 2008**	**CREDIT – 4**

OBJECTIVES

The course aims to introduce the concepts of Finite differences, Central differences, Interpolation for unequal intervals, Inverse interpolation and Solutions of simultaneous linear equations.

COURSE OUTCOMES:

The students after undergoing this course will be able to

CO1: develops the skill of calculation through forward and backward interpolations

CO2: learns to solve by central difference methods

CO3: knows to calculate interpolation for unequal intervals

CO4: collectively solves the solutions of simultaneous equations using different methods.

CO5: enables to understand the applications of integration in real life situation**.**

SEMESTER III	COURSE CODE: AMTCA302					COURSE TITLE: NUMERICAL METHODS									HOURS 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	4	4	3	4	3	3	4	4	3	3	3	4	3	3	3.4
CO2	3	3	4	3	4	3	4	4	4	3	4	3	4	3	4	3.5
CO3	3	3	4	3	4	3	4	3	3	3	4	3	4	4	3	3.4
CO4	3	3	3	4	4	3	4	3	3	3	3	3	4	3	3	3.3
CO5	3	3	4	4	4	3	3	3	4	4	3	3	3	4	4	3.5
Mean Overall Score																3.4

Result: The Score of this Course is 3.4 (High)

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Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes

UNIT- I: FINITE DIFFERENCES

First and higher order differences-forward differences and Back ward differences-Properties of operators-Differences of a Polynomial-Factorial Polynomials – Operator E, Relation between Δ, ∇ and E – Interpolation – Newton – Gregory forward & backward formulae for interpolation (without proof) – simple problems.

Chapters: 3 (3.1- 3.5, 3.12-3.16)

UNIT-II: CENTRAL DIFFERENCES

Central difference Operators – Central differences formulae: Gauss Forward and Backward formulae (without proof) – simple problems – Sterling's formula (without proof) – simple problems – Bessel's formula (without proof) – simple problems.

Chapters: 3 (3.6 – 3.10)

UNIT – III: INTERPOLATING FOR UNEQUAL INTERVALS AND INVERSE INTERPOLATION

Divided differences – Newton's divided differences formula and Lagrange's formula [without proof] – Estimating the Missing terms [with one or more missing values] - Lagrange's method and Reversion of series method [Using Newton's forward formula only]

Chapters: 4(fully)

UNIT – IV: SOLUTION OF SIMULTANEOUS EQUATION

Gauss elimination method – matrix inversion method – Gauss – Jordan Method, Gauss – Seidal method – Crout's method [Three unknowns only]

Chapters: 1(1.1 -1.8)

UNIT – V: SOLUTION OF DIFFERENTIAL EQUATION

Euler's method, Euler's modified method, first order differential equation using Runge kutta method, Adam's method.

Chapters 2, 3 (3.2), 5

TEXT BOOK:

1. A. Singaravelu [2004], "Numerical Methods", Meenakshi Agency, Chennai

REFERENCE BOOKS:

1. S. Arumugham (2003), "Numerical Methods", New Gamma Publishing, Palayamkottai.
2. H.C. Saxena (1991), "Finite differences and Numerical Analysis", S. Chand & Co. Delhi
3. B.D. Gupta (2001), "Numerical Analysis", Konark Pub. Ltd., Delhi
4. P. Kandasamy, K. Thilagavathy (2003), "Calculus of Finite difference & Numerical Analysis", S. Chand & Company Ltd., New Delhi-55.

II – BBA(CA)	**RESOURCE MANAGEMENT TECHNIQUES**	**20ABM33**
SEMESTER– III	**For the students admitted from the year 2020**	**HRS/WK - 5**
ALLIED -I		**CREDIT – 4**

OBJECTIVE:

To expose the students to the basics of LPP, Transportation Problem, Sequencing Problem, Game Theory and Networks

COURSE OUTCOME:

The students after undergoing this course will be able to

CO1: Students able to know the basics in Operation Research and make the Model.

CO2: Students able to understand Transportation Method.

CO3: Students able to understand Assignment Model.

CO4: Students able to do the problems in Job problems.

CO5: Students able to study the basics to solve the Game problem.

SEMESTER III	COURSE CODE: 20ABM33					COURSE TITLE: RESOURSE MANAGEMENT TECHNIQUES									HOURS 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	4	3	4	4	2	5	4	3	4	3	4	2	2	4	3.4
CO2	3	3	3	4	2	2	5	4	2	3	3	4	2	3	4	3.1
CO3	4	3	2	3	2	3	4	5	2	3	4	5	3	2	3	3.2
CO4	3	4	4	2	3	2	5	3	4	3	2	4	3	3	2	3.0
CO5	4	5	3	2	2	3	5	3	3	3	5	5	2	3	3	3.4
						Mean Overall Score										3.22

Result: The Score of this Course is 3.22 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with programme outcomes and programme specific outcomes.

UNIT –I: BASIC CONCEPT OF OR

Introduction – Linear programming problem: Mathematical Formulation of the problem – Graphical solution – Graphical solution method – Simplex method .

UNIT-II: TRANSPORTATION MODEL

Definition, Formulation of Transportation Problem-North-west corner method –Matrix minima method- Vogel's Approximation method–Optimal solution of Transportation-modi's method

UNIT-III: ASSIGNMENT MODEL

Definition of Assignment models- Formulation and solution of Assignment models using Hungarian Method-Unbalanced Assignment problems

UNIT-IV: SEQUENCING PROBLEM

Basic term used in sequencing-Processing of n jobs through two machines-Processing of n jobs through three machines- Processing two jobs through k machines-Johnson's Algorithm

UNIT –V: GAME THEORY

Two person zero sum game-Basic terms –Maximin and Minimax principle-Games without saddle point –Mixed stratergies– graphical solution of 2xn and mx2 games -Dominance property.

TEXT BOOK:

1. Kanti Swaru, Gupta P. K. and Manmohan [1999], "Operations Research", Sulthan Chand & Sons., New Delhi.

UNIT - I Chapter 1 : 1.1,1.5, 1.7, Chapter2: 2.2, Chapter 3: 3.2,3.3, Chapter 4: 4.1, 4.2, 4.
UNIT – II Chapter 10: 10.1, to 10.15
UNIT – III Chapter 11: 11.1 to 10.5
UNIT – IV Chapter 12: 12.1 to 12.6
UNIT – V Chapter 17: 17.1 to 17.7

REFERENCE BOOKS:

1. Gupta P. K and Hira D. S. [2000], "Problems in Operations Research", Sulthan Chand &Sons., Delhi.
2. J. K. Sharma, [2001], "Operations Research Theory and Applications", Macmillan, Delhi
3. Taha H. A.[2003], "Operations Research" , Macmillan Publishing Company, New York.
4. P.R. Vittal [2003], "Operations Research" , Margham Publications, Chennai.

II – BCA	**RESOURCE MANAGEMENT TECHNIQUES**	**20AMCA43**
SEMESTER – IV	**For the students admitted from the year 2020**	**HRS/WK – 5**
ALLIED -III		**CREDIT – 4**

OBJECTIVE:
To expose the students to the basics of LPP, Transportation Problem, Sequencing Problem, Game Theory and Networks

COURSE OUTCOME:
The students after undergoing this course will be able to
CO1: Students able to know the basics in Operation Research and make the Model.
CO2: Students able to understand Transportation Method.
CO3: Students able to understand Assignment Model.
CO4: Students able to do the problems in Job problems.
CO5: Students able to study the basics to solve the Game problem.

SEMESTER IV	COURSE CODE: 20AMCA43					COURSE TITLE: RESOURCE MANAGEMENT TECHNIQUES									HOURS: 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	4	4	3	4	3	3	4	4	3	3	3	4	3	3	3.4
CO2	3	3	4	3	4	3	4	4	4	3	4	3	4	3	4	3.5
CO3	3	3	4	3	4	3	4	3	3	3	4	3	4	4	3	3.4
CO4	3	3	3	4	4	3	4	3	3	3	3	3	4	3	3	3.3
CO5	3	3	4	4	4	3	3	3	4	4	3	3	3	4	4	3.5
Mean Overall Score																3.4

Result: The Score of this Course is 3.4 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT –I: BASIC CONCEPT OF OR

Introduction – Linear programming problem: Mathematical Formulation of the problem – Graphical solution – Graphical solution method – -Simplex method.

UNIT-II: TRANSPORTATION MODEL

Definition, Formulation of Transportation problem-North-west corner method –Matrix minima method- Vogel's Approximation method –Optimal solution of Transportation-Modi's method

UNIT-III: ASSIGNMENT MODEL

Definition of Assignment models- Formulation and solution of Assignment models using Hungarian Method-Unbalanced Assignment problems

UNIT-IV: SEQUENCING PROBLEM

Basic term used in sequencing-Processing of n jobs through two machines-Processing of n-jobs through k- machines- Processing two jobs through k machines-Johnson's Algorithm

UNIT –V: GAME THEORY

Two person zero sum game-Basic terms –Maximin and Minimax principle-Games without saddle point –Mixed stratergies– graphical solution of 2xn and mx2 games -Dominance property.

TEXT BOOK:

1.Kanti Swaru, Gupta P. K. and Manmohan [1999], "Operations Research", Sulthan Chand & Sons., Delhi.

UNIT – I: Chapter2: 2.1, 2.2, Chapter 3: 3.1,3.2, Chapter 4: 4.1, 4.2, 4.
UNIT – II Chapter 10: 10.1, to 10.15
UNIT – III Chapter 11: 11.1 to 10.5
UNIT – IV Chapter 12: 12.1 to 12.6
UNIT – V Chapter 17: 17.1 to 17.7

REFERENCE BOOKS:

1. Gupta P. K and Hira D. S. [2000], "Problems in Operations Research", Sulthan Chand &Sons., Delhi.
2. J. K. Sharma, [2001], "Operations Research Theory and Applications", Macmillan, Delhi
3. Taha H. A.[2003], "Operations Research" , Macmillan Publishing Company, New York.
4. P.R. Vittal [2003], "Operations Research" , Margham Publications, Chennai.

II – B.Com.	BUSINESS MATHEMATICS For the students admitted from the year 2014	AMCM401
SEMESTER – IV		HRS/WK – 5
ALLIED-I		CREDIT – 4

(For B.COM. II – Year)

OBJECTIVES:

The course aim is to introduce the concepts of operations on set and applications, to study the characteristic of analytical geometry, differential calculus, matrices and commercial arithmetic.

COURSE OUTCOMES:

The students after undergoing this course will be able to

CO1: Know the basic concepts of operations on sets, relations and functions.

CO2: Learn to form an equation of straight line, distance, slope and interpretations.

CO3: Abel to find limit, continuity, average and marginal concepts using differential calculus.

CO4: Able to understand the operations on matrices and to find solution of system of linear equations.

CO5: Enable to calculate percentage, simple and compound interests.

SEMESTER IV	COURSE CODE: AMCM401					COURSE TITLE: BUSINESS MATHEMATICS									HOURS 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	5	2	2	4	3	5	5	2	4	3	3	3	3	4	3.4
CO2	4	5	3	4	3	4	4	3	5	4	3	4	5	3	5	3.9
CO3	3	4	3	3	2	3	5	2	4	3	2	3	4	2	4	3.1
CO4	3	5	3	4	2	5	4	3	3	4	3	3	5	3	4	3.6
CO5	4	4	3	4	3	3	5	4	4	4	3	4	4	4	4	3.8
Mean Overall Score																3.5

Result: The Score of this Course is 3.5 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT - I: SET THEORY

Basic concepts – Subsets – Operations on sets Applications – Cartesian Product – Relation – Properties of relation - Functions.

UNIT – II: ANALYTICAL GEOMETRY

Distance – Slope of a straight line – Equation of Straight line – Interpretation – Break even analysis – Parabolas.

UNIT – III: DIFFERENTIAL CALCULUS

Limits – Continuity – Average & Marginal concepts – Differential coefficient concepets – Simple applications to Economics.

UNIT – IV: MATRICES

Addition of matrices –Scalar Multiplication-Multiplication of a matrix by a matrix- Inverse of a matrix – Solution of a system of linear equation –Input output Analysis.

UNIT – V: COMMERCIAL ARITHMETIC

Percentages – Simple and Compound interests – Arithmetic and Geometric Series – Simultaneous Linear equations.

TEXT BOOK:

1. "An Introduction to Business Mathematics", V. Sundaresan, S. D. Jaya Seelan, S. Chand & Company Ltd, New Delhi (2003).
   Unit-I: Chap:2 (Sec: 2.1 – 2.7),
   Unit-II: Chap:1 (Sec: 1.1-1.4,1.6-1.8),
   Unit-III: Chap:3 (Sec: 3.1,3.2,3.4,3.5,3.11),
   Unit-IV: Chap:8 (Sec: 8.2-8.7),
   Unit-V: Chap:7 (Sec: 7.1,7.2,7.3,7.5).

REFERENCE BOOKS:

1. "Business Mathematics", Qazi Zameeruddin, V. K. Kahanna, S. K. Bhambri, Vikas Publishing Pvt Ltd, New Delhi (1995).
2. "Business Mathematics", V. K. Kapoor, S. Chand & Company Ltd, New Delhi (1994).

II – BBM	MATHS FOR COMPETITIVE EXAMS For the students admitted from the year 2014	AMBM401
SEMESTER - IV		HRS/WK – 5
ALLIED-I		CREDIT – 4

OBJECTIVES:

The course aim is to introduce the concepts of operations on set and applications, to study the characteristic of analytical geometry, differential calculus, matrices and commercial arithmetic.

COURSE OUTCOMES:

CO1: Know the basic concepts of operations on sets, relations and functions.
CO2: Learn to form an equation of straight line, distance, slope and interpretations.
CO3: Able to find limit, continuity, average and marginal concepts using differential calculus.
CO4: Able to understand the operations on matrices and to find solution of system of linear equations.
CO5: Enable to calculate percentage, simple and compound interests.

SEMESTER IV	COURSE CODE: AMBM401					COURSE TITLE: MATHS FOR COMPETITIVEEXAMS									HOURS 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	3	5	2	2	4	3	5	5	2	4	3	3	3	3	4	3.4
CO2	4	5	3	4	3	4	4	3	5	4	3	4	5	3	5	3.9
CO3	3	4	3	3	2	3	5	2	4	3	2	3	4	2	4	3.1
CO4	3	5	3	4	2	5	4	3	3	4	3	3	5	3	4	3.6
CO5	4	4	3	4	3	3	5	4	4	4	3	4	4	4	4	3.8
Mean Overall Score																3.5

Result: The Score of this Course is 3.5 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

UNIT - I: SET THEORY

Basic concepts – Subsets – Operations on sets Applications – Cartesian Product – Relation – Properties of relation - Functions.

UNIT – II: ANALYTICAL GEOMETRY

Distance – Slope of a straight line – Equation of Straight line – Interpretation – Break even analysis – Parabolas.

UNIT – III: DIFFERENTIAL CALCULUS

Limits – Continuity – Average & Marginal concepts – Differential coefficient concepets – Simple applications to Economics.

UNIT – IV: MATRICES

Addition of matrices –Scalar Multiplication-Multiplication of a matrix by a matrix- Inverse of a matrix – Solution of a system of linear equation –Input output Analysis.

UNIT – V: COMMERCIAL ARITHMETIC

Percentages – Simple and Compound interests – Arithmetic and Geometric Series – Simultaneous Linear equations.

TEXT BOOK:

1. "An Introduction to Business Mathematics", V. Sundaresan, S. D. Jaya Seelan, S. Chand & Company Ltd, New Delhi (2003).
   Unit-I: Chap:2 (Sec: 2.1 – 2.7),
   Unit-II: Chap:1 (Sec: 1.1-1.4,1.6-1.8),
   Unit-III: Chap:3 (Sec: 3.1,3.2,3.4,3.5,3.11),
   Unit-IV: Chap:8 (Sec: 8.2-8.7),
   Unit-V: Chap:7 (Sec: 7.1,7.2,7.3,7.5).

REFERENCE BOOKS:

1. "Business Mathematics", Qazi Zameeruddin, V. K. Kahanna, S. K. Bhambri, Vikas Publishing Pvt Ltd, New Delhi (1995).
2. "Business Mathematics", V. K. Kapoor, S. Chand & Company Ltd, New Delhi (1994).

II YEAR	QUANTITATIVE APTITUDE	NMTQA301
SEMESTER - III	For the students admitted from the year 2021	HRS/WK – 3
NME		CREDIT – 2

OBJECTIVES:

The course aims the importance of aptitude skills among the students who faces the placement for their recruitment and introduces methods to develop their skills also their problem-solving techniques.

COURSE OUTCOMES:

CO1: Acquires the knowledge on calculative skills
CO2: develops the skill of analyzing
CO3: exposed to identify and solve different kinds of problems to be solved
CO4: to optimize inner confidence of approaching the task
CO5: gets knowledge on importance on quantitative techniques

SEMESTER III	COURSE CODE: NMTQA301					TITLE OF THE PAPER: Quantitative Aptitude									HOURS: 3	CREDITS 3
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)									MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	
CO1	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	3.9
CO2	3	4	4	4	3	3	3	4	4	4	3	4	4	4	3	3.6
CO3	4	3	4	4	4	4	4	4	3	4	4	4	3	4	4	3.8
CO4	4	4	3	3	4	3	4	4	4	4	4	3	4	4	4	3.7
CO5	4	4	4	4	4	4	4	4	4	3	4	4	4	3	4	3.9
Mean Overall Score																3.8

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT 1: Number skill

Introduction –Simplification - Powers and roots – surds and indices – Logarithms

UNIT 2: Professional skill

Introduction – Ratio and proportion – Percentages – Averages – Direct & indirect proportion.

UNIT 3: Time based skill

Introduction – Time and work – Time and distance – Calendars – Clocks.

UNIT 4: Geometric skill

Introduction – Geometry – Plane figures – Geometry – Solid figures – Heights and Distances – Bar graphs – Pie charts – Line graphs.

UNIT 5: Banker's skill

Introduction – Simple interest – Compound interest – Stocks and shares – Bankers's discount.

REFERENCES:

1. R.S. Priya, Quick Quantitative Aptitude, Dipti Press (OPC) Pvt. Ltd., 2017.
2. Dr. R.S. Aggarwal, Quantitative Aptitude, S. Chamd, 2015.