ST. JOSEPH'S COLLEGE OF ARTS & SCIENCE (AUTONOMOUS)

CUDDALORE-1

PG & RESEARCH DEPARTMENT OF MATHEMATICS

B.Sc. MATHEMATICS

SYLLABUS (2019-2020)

CURRICULUM TEMPLATE

Year/ Sem	Subject	SUB CODE	Title of the paper	Hrs	Credits	Total Credits
I YEAR/ I SEM	Language-I	LT101S	TAMIL/HINDI/ FRENCH – I	4	3	23
	English-I	LE101T	ENGLISH – I	4	3	
	Core-I	MT101S	ALGEBRA & TRIGNOMETRY	5	4	
	Core-II	MT102P	ANALYTICAL GEOMETRY AND THREE DIMENSION	6	4	
	Allied-I	18SMT101	ALLIED STATISTICS-I	8	6	
	AEC	19AEC101	ENGLISH COMMUNICATION	1	1	
	SEC	VE101T	VALUE EDUCATION	2	2	
I YEAR/ II SEM	Language-II	LT202T	TAMIL/HINDI/ FRENCH – II	4	3	23
	English-II	LE202T	ENGLISH – II	4	3	
	Core-III	MT203S	CALCULUS	6	4	
	Core-IV	MT204S	NUMERICAL METHODS	5	4	
	Allied-II	18SMT202 / 18SMP201	ALLIED STATISTICS II	8	4	
			ALLIED STASTICS –II (PRACTICAL)		2	
	AEC	19AEC202	ENGLISH COMMUNICATION	1	1	
	SEC	EPD201T	DYNAMICS OF PERSONALITY	2	2	
II YEAR/ III SEM	Language-III	LT303T	TAMIL /HINDI/ FRENCH – III	4	3	23
	English-III	LE303T	ENGLISH – III	4	3	
	Core-V	MT305S	DIFFERENTIAL EQUATIONS	5	4	
	Core-VI	MT306S	VECTOR AND FOURIER ANALYSIS	6	4	
	Allied-III	ACMT301Q	COST & MANAGEMENT ACCOUNTING	8	6	
	SEC	19AOFA31/ EVS301S	FIRST AID(Shift-II) / EVS (Shift-I)	3	3	
II YEAR/ IV SEM	Language-IV	LT404T	TAMIL / HINDI / FRENCH – IV	4	3	22
	English-IV	LE404T	ENGLISH – IV	4	3	
	Core-VI	MT407S	FUZZY SETS AND ITS APPLICATIONS	6	4	
	Core-VIII	MT408	GRAPH THEORY	5	4	
	Allied-IV	APH401T /	ALLIED PHYSICS	8	4	
			ALLIED PHYSICS (PRACTICAL)		2	
	AEC	EVS401S/ 19AOFA41	ENVIRONMENTAL SCIENCE (Shift-II) / FIRST AID (Shift-I)	3	2	

IIIYEAR/ V SEM	Core-IX	MT509	ABSTRACT ALGEBRA	6	5	26
	Core-X	MT510	REAL ANALYSIS –I	6	5	
	CoreXI	MT511	COMPLEX ANALYSIS – I	6	4	
	Elective –I	18EMT512 / EMT512A	MECHANICS / A SPECIAL FUNCTIONS	5	4	
	Elective-II	EMT513S / EMT513A	MAT-LAB / THEORY OF FUZZY NUMBER SYSTEM	3	2	
		MTP501	PROGRAMMING IN MATLAB	2	2	
	SEC (E-Learning / Dept.)	19SMT51	ARITHMETIC AND QUANTITATIVE APPTITUDE FOR COMPETITATIVE EXMINATION.	2	2	
	SSC (Optional)	19SSMT52	HISTORY OF MATHEMATICS	-	2	
IIIYEAR/ VI SEM	Core-XII	MT614	LINEAR ALGEBRA	6	5	25
	Core-XIII	MT615	REAL ANALYSIS-II	6	5	
	Core-XIV	MT616	COMPLEX ANALYSIS- II	6	5	
	Elective-III	EMT617 / EMT617A	PROGRAMMING IN C LANGUAGE / MATHEMATICAL MODELLING	4	2	
		MTP601	PROGRAMMING IN C LANGUAGE – PRACTICAL	2	2	
	Elective-IV	EMT618S / EMT618A	OPERATIONS RESEARCH / ASTRONOMY	6	4	
	Skill		EXTENSION ACTIVITES	-	2	
			TOTAL CREDITS =142			

Courses offered to other Department

S. No	Department	Year/Sem	Paper Code	Paper Name	No. Of Hours
1	Physics	I year/ I sem	AMT101Q	Allied Mathematics-I	8
2	Physics	I year/II Sem	AMT202T	Allied Mathematics-II	8
3	Chemistry	I Year/ I Sem	AMT101Q	Allied Mathematics-I	8
4	Chemistry	I year/II Sem	AMT202T	Allied Mathematics-II	8
5	Computer Science	I Year / I Sem	AMCS101T	Allied Mathematics-I	8
6	Computer Science	I Year/ II Sem	19AMCS22	Allied Mathematics-II	8
7	Computer Application	I Year/ I Sem	AMTCA101	Mathematical Foundation	5
8	Computer Application	II Year/III Sem	AMTCA302	Numerical Methods	5
9	Computer Application	II Year/IV Sem	AMCA403S	Resource Management Techniques	5
10	B.Com (Commerce)	II Year/IV Sem	AMCM401	Business Mathematics	5
11	B.Com (Bank Management)	II Year/ IV Sem	AMBM401	Mathematics for Competitive Exams	5
11	BBA(CA)	II Year/ III Sem	17ABM33	Resource Management Techniques	5
12	Computer Science	I Year / I Sem	PCS701S	Mathematical Foundation for Computer Science	4

I-B.Sc(MATHS)	ALGEBRA AND TRIGONOMETRY For the students admitted from the year 2014	MT101S
SEMESTER-I		HRS/WK – 6
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 OUTCOME:

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 & solving homogeneous systems.

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: MT101S					TITLE OF THE PAPER: ALGEBRA AND TRIGNOMETRY										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	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	

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 - I: THEORY OF EQUATIONS

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

UNIT -II: SUMMATION OF SERIES

Binomial - Exponential and Logarithmic series [Theorems without proofs]

UNIT -III: MATRICES

Symmetric and Skew symmetric – Hermitian and Skew Hermitian – Orthogonal and Unitary Matrices – rank of Matrix – Consistency and solutions of Linear Systems – Cayley Hamilton Theorem[without proof] – Eigen Values – Eigen Vectors – Similar Matrices – Diagonalisation of Matrix.

UNIT - IV: 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-V : 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 - Hyperbolic and Inverse Hyperbolic functions: Real and Imaginary parts - Inverse Hyperbolic functions.

TEXT BOOKS:

1. T.K.Manicavachagom Pillay, T.Natarajan and K.S.Ganapathy[2004],"Algebra",Volume I & II S.Viswanathans Printers Pvt. Ltd. Chennai.
2. P. Kandasamy, K.Thilagavathy [2004], "Mathematics for B.Sc" ,Volume- I, II, III & IV, S.Chand & Company Ltd., New Delhi-55.

REFERENCE BOOKS:

1. S.Arumugam [2003], "Algebra", New Gamma Publishing House, Palayamkottai.
2. A.Singaravelu [2003], "Algebra and Trigonometry", Volume – I &II Meenakshi Agency, Chennai.
3. S.Sudha [1998], "Algebra and Trigonometry", Emerald Publishes, Chennai.

I – B.Sc (Maths)	ANALYTICAL GEOMRTRY OF THREE DIMENSION 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					TITLE OF THE PAPER: 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	

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 - 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 – Angel between the Plane and the Line.

Unit-III: STRAIGHT LINE (Contd..)

coplanar lines – 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)		MT203S
SEMESTER – II	CALCULUS	HRS/WK – 6
CORE – III	For the students admitted from the year2014	CREDIT – 4

OBJECTIVES

The course aims to introduce the concepts of Differential Calculus, Curvature, Asymptotes, and Reduction formulae, Beta and Gamma Functions and Double Integrals.

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 V	COURSE CODE: MT2035					TITLE OF THE PAPER: CALCULUS										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	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	

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 - I:DIFFERENTIAL CALCULUS

Jacobians – Derivative of implicit function using differentials, composite functions - Total differential – maxima and minima functions of 2 and 3 independent variable, Lagrange's method [without proof].

UNIT - II:DIFFERENTIAL CALCULUS[Contd]

Curvature, Radius of Curvature in Cartesian and Polar coordinates , p-r equation.

UNIT – III: DIFFERENTIAL CALCULUS[Contd]

Evolutes, Envelope, Asymptotes: Methods [without proof] of finding asymptotes of rational algebraic curves with special cases.

UNIT –IV:INTEGRAL CALCULUS

Reduction formulae, Beta , Gamma Functions and their Properties .

UNIT –V: INTEGRAL CALCULUS[Contd]

Change of order of Integration – Applications to Area, Surface Area and Volume.

TEXT BOOKS:

1.S.Narayanan and T.K.Manicavachagom Pillay [2006], "Calculus" Volume-I & II,S.Viswanathan Printers & Publishers Pvt.Ltd. Chennai.

Volume-I: Unit-II- Chapter: X (Sec:2.1-2.4,2.6-2.8),

Volume-II: Unit-IV- Chapter:1 (Sec:13.1-13.10) & Chapter:7 (Sec:2.1-6),

2. P.Kandasamy, K.Thilagavathy [2004], "Mathematics for B.Sc", Vol-I &II , S.Chand & Company Ltd., New Delhi-55.

Volume-I: Unit-I- Pages:(199-209 , 215 – 241),

Unit-IV- Chapter:3 (Pg No:303 -317)

Volume-II: Unit-II-Chapter 2: (324-344)

Unit-III- Chapter: 3 (Pgs:345 - 361) & Chapter:4 (Pgs:380 - 396).

Unit-IV- Chapter:5 (Pg No:397 -428)

Unit-V- Chapter:6 (Pg. no: 432-491)

REFERENCE BOOKS:

1. Shanti Narayan [2001], "Differential Calculus",Shyamlal Charitable Trust, New Delhi.

2. 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 For the students admitted from the year 2015	MT204S
SEMESTER – II		HRS/WK – 5
CORE – IV		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 OUTCOME:

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

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

CO3: Students able to pertain 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: MT204S					TITLE OF THE PAPER: NUMERICAL METHODS AND COMPUTER APPLICATION										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	

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- 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-Factorial polynomial.

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-Adam's method-Trapezoidal rule-Simpson's 1/3rd rule-Simpson's 3/8 th rule.

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.

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** **For the students admitted from the year 2014**	**MT305S**
SEMESTER – III		**HRS/WK - 5**
CORE – 5		**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 OUTCOME:

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 Transform and Formation of PDF

SEMESTER III	**COURSE CODE: MT305S**					**TITLE OF THE PAPER: DIFFERENTIAL EQUATIONS**									**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**

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-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 [Contd]:

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

UNIT III:TOTAL DIFFERENTIAL EQUATIONS

Total Differential Equations – Different Methods of solving $Pdx+Qdy+Rdz = 0$.

UNIT – IV: 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 – V: LAPLACE TRANSFORM:

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

TEXT BOOK:

1. P.Kandasamy, K.Thilagavathy [2004], "Mathematics for B.Sc" Vol-,III, S.Chand & Company Ltd., New Delhi-55.

Unit-I: Chapters:1,2,3 (pgs: 1 - 41) ,Unit-II:Chapters:4,5 (pgs: 48 -87),
Unit-III: Chapter:6 (pgs:92-116) , Unit-IV:Chapters:1,2 (pgs:117-185),
Unit-V: Chapter:1 (pgs:164-185).

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: III-B", National Publishing Company, Chennai.

II – B.Sc (Maths)	**VECTOR AND FOURIER ANALYSIS** **For the students admitted from the year 2014**	**MT306S**
SEMESTER - III		**HRS/WK – 6**
CORE – 6		**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:

CO1: develops the skill on solving problems on vector calculus
CO2: learns to solve problems on gradient and divergence and curl
CO3: knows the difference in line, surface and volume integral and their interpretation
CO4: enables to understand the concepts on Fourier series expansions and familiarizes with half range Fourier series along with periodic functions
CO5: analyze sine and cosine transforms and its properties

SEMESTER III	**COURSE CODE: MT306S**					**TITLE OF THE PAPER: 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**	

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 – I: DIFFERENTIAL VECTOR CALCULUS

Differentiation of a Vector – Geometrical Interpretation of the Derivative – Differentiation Formulae – Differentiation of dot and Cross Products – Partial Derivatives of Vectors – Differentials of Vectors.

UNIT – II: GRADIENT, DIVERGENCE AND CURL

Vector Differential Operator Del – Gradient of a Scalar Function – Directional Derivative – Geometric Interpretation – Gradient of the sum of Functions; of the product of functions and of a function of function – Operations involving Del – Divergence of a Vector and its Physical Interpretation – Curl of a Vector and its Physical Interpretation – Expansion Formulae for Operators involving Del – Solenoidal and Irrotational.

UNIT – III: VECTOR INTEGRATION

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

UNIT – IV: FOURIER SERIES

Conditions for Fourier Expansion – Functions having Discontinuity – Change of Interval – Odd and Even Functions – Expansions of Odd or Even periodic Functions – Half range series – Typical Wave Forms – Parseval's Formula.

UNIT – V: 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 [with out proof] – Properties of Fourier Transforms – Convolution Theorem for Fourier Transforms – Parseval's Identity for Fourier Transforms – [with out derivation].

TEXT BOOKS:

1. P.R.Vittal [2004], "Vector Analysis,Analytical Solid Geometry & Sequences & Series", Margham Publication, Chennai.
Unit-I & II: Chapter-1, Unit-III: Chapter-2.
2. P.R.Vittal [2002], "Differential equations, Fourier & LaplaceTransformsand Probability". Margham Publication, Chennai.
Unit-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", III-B, National Publishing Company., Chennai.

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

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

COURSE OUTCOMES:

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**					**TITLE OF THE PAPER: FUZZY SETS AND APPLICATION**										**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**	

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 I - FUZZY SET THEORY

Fuzzy sets – Fuzzy set : definition – Different types of fuzzy sets – General definitions and properties of fuzzy sets – Other important operations – General properties : 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 quatifiers – linguistic hedges.
(Sec: 7.13 – 7.18)

TEXT BOOK :

Dr.SudhirK.Pundir and Dr.RimplePundir, Fuzzy sets and their applications.

REFERENCE BOOK:

A.Kaufmann “Introduction to the Theory of fuzzy

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

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 situation.

SEMESTER IV	**COURSE CODE: MT408**					**TITLE OF THE PAPER: 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**	

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 – I:
Graphs- Sub graphs- Degree of a vertex- Isomorphism of graph- independent sets and coverings- intersection graphs.

UNIT –II:
Adjacency and Incidence matrices- Operations on graphs- Degree sequences- Graphic sequences- Walks- trails- paths.

UNIT –III:
Connectedness and components- Cut point- Bridge- Block- Connectivity theorems.

UNIT – IV:
Eulerian graphs and Hamiltonian graphs- Trees.

UNIT – V:
Planarity- Characterizations of planar graph- Colourability- Chromatic number and index.

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(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(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 For the students admitted from the year 2008	MT509
SEMESTER –V		Hrs / Week: 6
CORE –IX		Credit: 5

OBJECTIVE:

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

COURSE OUTCOME:

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					TITLE OF THE PAPER: 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	3.6	
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	

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 – I: GROUPS

Definition of a Group - Examples – Subgroups

UNIT – II: GROUP [CONTD]

Counting Principle – Normal Subgroups – Homomorphism.

UNIT – III: GROUP [CONTD]

Automorphisms – Cayley's Theorem – Permutation Groups.

UNIT – IV: RINGS

Definition and Examples - Integral Domain – Homomorphism of Rings – Ideals and Quotient Rings.

UNIT – V : RINGS [CONTD]

Prime Ideal and Maximal Ideal – The field of quotients of an Integral domain – Euclidean rings.

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", 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], Tat McGraw Hill, New Delhi.
4. M.L.Santiago[2002], "Modern Algebra", Tat McGraw Hill, New Delhi
5. SurjeetSingh 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 –X	For the students admitted from the year 2008	Credit: 5

OBJECTIVES

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

COURSE OUTCOME:

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.

SEMESTERI	COURSE CODE: MT510					TITLE OF THE PAPER: REAL ANALYSIS I									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	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

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 – I:

Functions – Real valued functions – 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 [CONTD]

Operations on Convergent Sequence Operation 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 [CONTD]

Rearrangement of Series – Tests for Absolute Convergence – Series whose terms form a non-increasing Sequence – Summation of Parts. Limits and Metric spaces: Limit of an 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, NewYork.
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 For the students admitted from the year 2008	MT511
SEMESTER –V		Hrs / Week: 6
CORE –XI		Credit: 5

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:

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: MT511					TITLE OF THE PAPER: COMPLEX ANALYSIS-I										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	4	3	3	4	3	5	4	3	4	3	4	3	4	4	3.7	
CO2	3	4	3	3	3	3	5	4	3	4	4	4	3	4	5	3.7	
CO3	3	5	3	3	4	4	5	4	3	5	3	4	4	4	4	3.9	
CO4	3	5	3	3	4	4	5	4	3	4	4	4	3	4	4	3.8	
CO5	4	4	3	3	4	4	5	4	3	5	4	4	4	4	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- I:

Complex numbers: Sums and products – Basic algebraic properties – Further properties – Vectors and Moduli – Complex conjugates – Exponential form – Products and powers in exponential form – Arguments of products and quotients – Roots of complex numbers – Examples – Regions in the complex plane.

UNIT- II:

Functions of a Complex variable – Mappings - Mapping by the exponential function– Limits – Theorems on Limits – Limits involving the point at infinity – Continuity – Derivatives – Differentiationformulas

UNIT- III:

Cauchy-Riemann Equations-Sufficient Conditions For Differentiability-Polar Coordinates-Analytic Functions-Examples-Harmonic Functions-Uniquely Determined Analytic Functions-Reflection Principle.

UNIT- IV:

The Exponential Function-The Logarithmic Function-Branches And Derivatives Of Logarithms-Trignometric Functions-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:

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

Unit-I: Chapter-1 (sec: 1 - 11), Unit-II: Chapter-2 (Sec: 12 - 20),Unit-III: Chapter-2 (Sec: 21-28), Unit-IV:Chapter-3 (Sec: 29-31 ,34-35), Unit-V:Chapter-4 (Sec: 37-41,43-47).

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, NewDelhi.

4. Murray R. Spiegel(2005), "Theory and Problems of Complex Variable", Tata-McGraw HillEdition, New Delhi.

YEAR – III	MECHANICS For the students admitted from the year 2017	17EMT512
SEMESTER –V		Hrs / Week: 6
ELECTIVE-I		Credit: 5

OBJECTIVES:

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

COURSE OUTCOMES:

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: 17MT512					TITLE OF THE PAPER: MECHANICS										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	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	

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-I FORCE:

Types of Force- Magnitude and direction of the resultant of the force acting on a particle – Triangle of Force –Lamie's Theorem.

UNIT-II KINEMATICS:

Kinematics of a particle- Velocity-Accelaration-RelativeVelocity-Relative Accealration-Angular Veloacity-Accelaration Components in Co-planer motion along

[a] Two fixed perpendicular direction ,

[b] Tangential and Normal Direction

[c] Radial and Transverse direction .

Work, Power, Energy , Principal of Work and Energy. Rectlinear motion with uniform acceleration.Simple Harmonic Motion.

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 anf Perpendicular Aixs , Momentum of Inertia Triangular Lamina, Circular Lamina, Circular Ring , Right Circuklar Cone, Sphere.(Solid and Hollow)

TEXT BOOK:

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: 1.2,2.2,2.3,1.3,4.1,4.2,4.3,),Chapter 11(sec 11.1-11.3)

chapter -1(1.3.1,1.3.2), 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, (19^{th} Ed) .

5.Joseph F.Shelley [2005], "Vector Mechanics for Engineers Vol-I: Dynamics", Tata McGraw Hill Edition, New Delhi.

YEAR – III	A SPECIAL FUNCTIONS For the students admitted from the year 2017	EMT512A
SEMESTER –V		Hrs / Week: 6
ELECTIVE –I		Credit: 5

OBJECTIVES:

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

COURSE OUTCOME:

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: EMT512A					TITLE OF THE PAPER: A SPECIAL FUNCTIONS										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	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	

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-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. B.Sc. Mathematics : Syllabus (CBCS)

REFERENCE BOOKS:

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

YEAR – III	MATLAB	EMT513S
SEMESTER –V		Hrs / Week: 4
ELECTIVE-II	For the students admitted from the year 2014	Credit: 2

OBJECTIVE:

To expose the students to the basics of Matlab windows, Operations in matlab, Loops and Polynomials and ordinary differential equation using Matlab.

COURSE OUTCOME:

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					TITLE OF THE PAPER: MATLAB										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	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	

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 – 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 arrays 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 – Bult in Math Function – Bult 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 :

MATLAB An Introduction with Applicationsby AMOS GILAT – John Wiley& sons, INCPublication . 2004.

Unit-I: Chapter 1: 1.1 – 1.6 and Chapter 2: 2.1 – 2.2 ,
Unit-II: Chapter 3: 3.1 – 3.6
Unit-III: Chapter 7 : 7.1 – 7.6 ,
Unit-IV: Chapter 8: 8.1 – 8.4 ,
Unit-V: Chapter 10: 10.1 – 10.4

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:

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**					**TITLE OF THE PAPER: 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**	

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 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 Pepration 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 Ralational Map (FRM) and its Variation –Their induced Model. Simple Applications

UNIT V: Graphs –Fuzzy Graphs-Simple Applications-Numbers-Fuzzy numbers-Different typers of Fuzzy numbers- simple Application.

TEXT BOOK

(i) 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)

(ii) 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)

(iii) 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)

(iv) Fuzzy Graphs And Fuzzy Hypergraphs – JohnN.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).

(v): 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

YEAR– III	LINEAR ALGEBRA For the students admitted from the year 2008	MT614
SEMESTER –VI		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.

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SEMESTER VI	COURSE CODE: MT614					TITLE OF THE PAPER: LINEAR 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	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

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 - I : VECTOR SPACES
Linear dependence and independence- Definition and examples.

UNIT – II: VECTOR SPACES [CONTD]
Dual space – inner product spaces.

UNIT – III:LINEAR TRANSFORMATIONS
Algebra of linear transformations – characteristics roots;

UNIT – IV : LINEAR TRANSFORMATIONS [CONTD]
Matrices, canonical forms: triangular forms.

UNIT – V: LINEAR TRANSFORMATIONS [CONTD]
Trace and Transpose, Determinants

TEXT BOOK:
I.N.Herstein [1989], "Topics in Algebra", Wiley Eastern Ltd. New Delhi.
Chapters – 4 & 6(Sec: 4.1, 4.2, 4.3, 4.4 & 6.1, 6.2, 6.3, 6.4, 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 For the students admitted from the year 2008	MT615
SEMESTER –V		Hrs / Week: 6
CORE-XIV		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 inerrability 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					TITLE OF THE PAPER: : 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	

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

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 – I: CONNECTEDNESS

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

UNIT –II: COMPLETENESS, COMPACTNESS

Complete Metric Spaces – Compact Metric Space – Continuous Functions on Compact Metric Spaces – Continuity of Inverse Functions

UNIT – III: RIEMANN INTEGRATION

Sets of measure zero- Definition of the Riemann Integral – Properties of the Riemann Integral – Derivatives – Rolle's Theorem

UNIT – IV: IMPROPER RIEMANN INTEGRATION

The Law of the Mean – 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

TEXT BOOK:

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 For the students admitted from the year 2008	MT616
SEMESTER –VI		Hrs / Week: 6
CORE-XV		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:

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					TITLE OF THE PAPER: 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	

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- 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(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	**THEORY: PROGRAMMING IN C LANGUAGE** **For the students admitted from the year 2014**	**EMT617S**
SEMESTER –VI		**Hrs / Week: 4**
ELECTIVE-III		**Credit: 5**

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					TITLE OF THE PAPER: PROGRAMMING IN C LANGUAGE									HOURS: 4	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	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

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 –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: COMPUTER PRACTICAL IN C LANGUAGE** **For the students admitted from the year 2014**	**MTP601**
SEMESTER –VI		**Hrs / Week: 2**
MAIN		**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", Mullish Cooper, Indian edition by jaico pubishers, 1987.

2. "Teach yourself C", Herbert Schildt, Obsbome Megrawhill, 2nd edition 1994 Programming in C- Schaum series.

YEAR – III	MATHEMATICAL MODELLING (Optional Paper) For the students admitted from the year 2017	EMT617A
SEMESTER –VI		Hrs / Week: 6
ELECTIVE-III (OPTIONAL)		Credit: 5

OBJECTIVE:
To achieve a broad understanding of the objectives of mathematical modeling 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 modeling in various fields like population, economics and medicine using System of O.D.E
CO3: Analyze and apply mathematical modeling for miscellaneous model
CO4: Study mathematical modeling through Difference equation
CO5: Analyze and draw modeling through Graphs

SEMESTER VI	COURSE CODE: EMT617A					TITLE OF THE PAPER: MATHEMATICAL MODELLING									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	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

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 I

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

UNIT IV

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

TEXT BOOK:

1. J.N. Kapur, Mathematical Modeling, 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 For the students admitted from the year 2014	EMT618S
SEMESTER –VI		Hrs / Week: 6
ELECTIVE-IV		Credit: 5

OBJECTIVES

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

COURSE OUTCOME

CO1: Use knowledge of operational research, LPP.
CO2:Formulate physical problems as operational research using assignment models.
CO3:Understand analogies between transportation problems, phenomena in operational research.
CO4: Classify operational research, game theory, interpret the solutions.
CO5:Interpret solutions in network analysis.

SEMESTER V1	COURSE CODE: EMT618S					TITLE OF THE PAPER: OPERATIONAL RESEARCH									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	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

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 - 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 - The two-phase 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 models - Comparison with the transportation models - Solution of the assignment model - The hungarian methods for solution of the assignment models - variation of the assignment problem.

SEQUENCING PROBLEM

Sequencing problems - processing 'n' jobs through two machines - processing 'n' jobs through three machines - processing two jobs through 'm' machines - processing n jobs through 'm' machines.

UNIT - IV: GAME THEORY

Definitions - Rules for game theory - Rule 1 look for a pure strategy - Rule 2 reduce game by dominance - 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 IN PROJECT PLANNING

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.

YEAR – III	**ASTRONOMY (Optional Paper)** **For the students admitted in the year 2012**	**EMT618A**
SEMESTER –VI		**Hrs / Week: 6**
ELECTIVE-IV (OPTIONAL)		**Credit: 5**

OBJECTIVE:

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

COURSE OUTCOME:

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: EMT618A					TITLE OF THE PAPER: ASTRONOMY										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	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	

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-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:

S. Kumaravelu and Susheela Kumaravelu (2004), "Astronomy", SKV Publishers,Nagarkoil.
Unit-I: (Sec: 1 – 86),Unit-II: (Sec: 87-91,105-109),Unit-III: (Sec: 117-133,135-144).

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 Edn)Published by Mrs. Rukmani Ramachandran, Tiruchirappalli.
6. M.Zeilik(2002), "Astronomy: The Evolving Universe", (9th Edn) CambridgeUniversity Press, Cambridge.

YEAR – I	ALLIED MATHEMATICS – I	AMCS101T
SEMESTER – I		HRS/WK – 8
ALLIED – 1	For the students admitted from the year 2014	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:

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: AMCS101T					TITLE OF THE PAPER: 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

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-I: THEORY OF EQUATIONS

Polynomial Equations with real Coefficients – Irrational roots – Complex roots – Symmetric functions of roots.

UNIT-II: THEORY OF EQUATIONS(CONTD)

Transformation of equation by increasing or decreasing roots by a constant – Reciprocal equations – Newton's method to find a root approximately (without proof) .

UNIT-III:MATRICES Rank of a matrix – Consistency of equations – Eigen roots and Eigen vectors – Cayley – Hamilton's theorem [without proof] – Verification and computation of inverse matrix.

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 co-ordinates.

TEXT BOOK:

1.P. Duraipandian and S. Udayabaskaran. 2005, " Allied Mathematics", Vol I & II. Chennai: Muhil Publishers.

Unit-I: Chap:3(3.1,3.1.1,3.1.2,3.2,3.2.1)
Unit-II: Chap:3(3.2.2,3.3,3.4.1), Unit-III: Chap:4(4.4,4.5,4.5.2,4.5.3),
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.

I – BCA		AMTCA101
SEMESTER - I	MATHEMATICAL FOUNDATIONS	HRS/WK – 5
ALLIED – 1	For the students admitted from the year 2008	CREDIT – 4

(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: AMTCA101					TITLE OF THE PAPER: MATHEMATICAL FOUNDATION									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	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

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 –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, Relations and Functions.

UNIT –III:PERMUTATION& COMBINATION

Binary operations, Permutations and Combinations, Mathematical induction.

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, rank of a matrix.

Consistency of a system of linear equations by

1. Cramer's rule
2. Matrix inversion method.
3. Rank method.

UNIT –V:MATRIX (CONTD)

Characteristic roots and characteristic vectors, and problems on Cayley-Hamilton theorem.

APPLICATION OF MATRICES: Matrix of linear transformation: Reflection about x -axis, y axis, the line y = x, and the line y = -x, rotation about the origin through an angleθ, expression and compression, shears, translation, successive transformation.

TEXT BOOKS:

1. "Mathematical Foundations", P.R.Vittal, 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 & 9.1-9.7).

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	ALLIED MATHEMATICS – I For the students admitted from the year 2018	AMT101Q
SEMESTER – I		HRS/WK – 8
ALLIED- 1		CREDIT – 6

(For B.Sc. Physics & Chemistry)

OBJECTIVES:

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

COURSE OUTCOMES:

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: AMT101Q					TITLE OF THE PAPER: 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

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-I: THEORY OF EQUATIONS

Polynomial Equations with real Coefficients – Irrational roots – Complex roots – Symmetric functions of roots.

UNIT-II: THEORY OF EQUATIONS(CONTD)

Transformation of equation by increasing or decreasing roots by a constant – Reciprocal equations – Newton's method to find a root approximately (without proof) .

UNIT-III:MATRICES

Characteristic equation of a square matrix– Eigen roots 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 BOOK:

P. Duraipandian and Dr. S. Udayabaskaran. 1997, "Allied Mathematics" , Vol I & II. Chennai: Muhil Publishers.

Unit-I: Sec(3.1,3.1.1,3.1.2,3.2,3.2.1),
Unit-II:Sec(3.2.2,3.3,3,3.4),
Unit-III:Sec(1.1.1,1.1.2,1.2,1.4.3),
Unit-IV:Sec(2.7,4.1,4.1.1,4.2),
Unit-V: Chap:3(3.4,3.4.1,3.5,3.5.1,3.5.2,3.6),

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.
4. P.Kandhasamy, K. Thilagavathy (2003), "Allied Mathematics" Vol I & II. New

YEAR – I	**ALLIED MATHEMATICS – II** **For the students admitted from the year 2014**	**19AMCS22**
SEMESTER – II		**HRS/WK –8**
ALLIED – 2		**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 Laplace Transform and inverse Laplace Transform by definition of a function.

CO2: Solve linear differential equations with constant coefficients using Laplace Transform.

CO3: Compute scalar and vector product, gradient and curl of functions

CO4: Apply Green's Theorem, Stoke's theorem and divergence theorem to evaluate Integrals.

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

SEMESTER I	COURSE CODE: 19AMCS22					TITLE OF THE PAPER: 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

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-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 and ASSIGNMENT MODEL:

Definitions of the transportation model - Formulation and solution of transportation models - North-west corner rule - Least cost method - Vogel's approximation method. Definition of Assignment Model- Formulation and Solution of Assignment Model-Special Cases in Assignment Model

UNIT-III: LAPLACE TRANSFORM:

Laplace Transform of Standard functions and Properties- Inverse Laplace Transform.

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 : Chapter 4: Page 4.1-4.28
   Unit-III : Section (7.1.1-7.1.4, 7.2, 7.2.1, 7.2.2, 7.2.3),
   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. Operation Research", Dr.S.J.Venkatesan,[2012], Sri Krishna Pubblications

YEAR – I	ALLIED MATHEMATICS – II For the students admitted from the year 2018	AMT202T
SEMESTER – II		HRS/WK – 8
ALLIED- 1I		CREDIT – 6

(For B.Sc Physics & Chemistry)

OBJECTIVES:

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

COURSE OUTCOMES:

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					TITLE OF THE PAPER: 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

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-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-Lagranges 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:

P. Duraipandian and S. Udayabaskaran(1997), "Allied Mathematics", Vol I & II. Chennai: Muhil Publishers.

Unit-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: Chap:6 (6.1,6.1.1,6.2,6.3,6.4),
Unit-IIISec(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:Sec(8.6.1, - 8.6.3),
Unit-V: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

II – BCA	**NUMERICAL METHODS**	**AMTCA302**
SEMESTER - III		**HRS/WK – 5**
Allied-2	**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:

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					TITLE OF THE PAPER: 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

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- 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.

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.

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]..

UNIT – IV: SOLUTION OF SIMULTANEOUS EQUATION

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

UNIT – V: SOLUTION OF DIFFERENTIAL EQUATION

Solving second order differential equation, Runge kutta method, Euler's modified method, Euler's method, Adam's method.

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.

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 – BCA		**AMTCA403S**
SEMESTER – IV	**RESOURCE MANAGEMENT TECHNIQUES**	**HRS/WK - 5**
ALLIED -3	**For the students admitted from the year 2015**	**CREDIT – 4**

.**OBJECTIVE:**

Toexposethe students to the basics of LPP,TransportationProblem,SequencingProblem,Game Theory and Networks

COURSE OUTCOME:

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 do the problems in Job problems.
CO4: Students able to study the basics to solve the Game problems
CO5: Students able to know the Networks and Relations.

SEMESTER IV	COURSE CODE: AMTCA403S					TITLE OF THE PAPER: 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	

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 –I: BASIC CONCEPT OF OR

Definitions of OR-Linear programming problem-Graphical solution -Simplex method – Artificial variables techniques – Big M method .

UNIT-II:TRANSPORTATION MODEL

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

ASSIGNMENT MODELS: Definition of Assignment models- Formulation and solution of Assignment models-Special cases in Assignment problems

UNIT-III:SEQUENCING PROBLEM

Basic term used in sequencing-Processing n jobs through two machines-Processing n jobs through three machines- Processing two jobs through k machines.

UNIT –IV: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.

UNIT –V:PERT/CPM NETWORKS:

Introduction –Network and basic component –Logical sequencing -Fulkerson's rule of the Network construction –Critical path Analysis &PERT analysis- PERT-Distinction between PERT and CPM .

TEXT BOOK:

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

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		**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:

CO1: Know the basic concepts of operations on sets, relations and functions.
CO2: Learn to form an equations of straight line, distance, slope andinterpretations.
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					TITLE OF THE PAPER: 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

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 I:SET THEORY

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

UNIT – II:ANALYTICAL GEOMETRY

Distance – Slope – 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:1.2-1.4,1.6-1.8),
Unit-III: Chap:3(Sec:3.1,3.2,3.4,3.5,3.11),
Unit-IV: Chap:8 (8.2-8.7),
Unit-V: Chap:7(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	**MATHEMATICS FOR COMPETITIVE EXAMS**	**AMBM401**
SEMESTER - IV		**HRS/WK – 5**
ALLIED	**For the students admitted from the year 2014**	**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 andinterpretations.
CO3: Able to find limit, continuity, average and marginal concepts usingdifferential 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					TITLE OF THE PAPER: MATHEMATICS 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

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 I:SET THEORY

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

UNIT – II:ANALYTICAL GEOMETRY

Distance – Slope – 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:1.2-1.4,1.6-1.8),
Unit-III: Chap:3(Sec:3.1,3.2,3.4,3.5,3.11),
Unit-IV: Chap:8 (8.2-8.7),
Unit-V: Chap:7(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 – BBA(CA)		17ABM33
SEMESTER - IV	**RESOURCE MANAGEMENT TECHNIQUES**	**HRS/WK – 5**
ALLIED -1	**For the students admitted from the year 2017**	**CREDIT – 4**

.**OBJECTIVE:**

Toexposethe students to the basics of LPP,TransportationProblem,SequencingProblem,Game Theory and Networks

COURSE OUTCOME:

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 do the problems in Job problems.
CO4: Students able to study the basics to solve the Game problems
CO5: Students able to know the Networks and Relations.

SEMESTER IV	COURSE CODE: 17ABM33					TITLE OF THE PAPER: 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	

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 –I: BASIC CONCEPT OF OR

Definitions of OR-Linear programming problem-Graphical solution -Simplex method – Artificial variables techniques – Big M method .

UNIT-II:TRANSPORTATION MODEL

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

ASSIGNMENT MODELS: Definition of Assignment models- Formulation and solution of Assignment models-Special cases in Assignment problems

UNIT-III:SEQUENCING PROBLEM

Basic term used in sequencing-Processing n jobs through two machines-Processing n jobs through three machines- Processing two jobs through k machines.

UNIT –IV: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.

UNIT –V:PERT/CPM NETWORKS:

Introduction –Network and basic component –Logical sequencing -Fulkerson's rule of the Network construction –Critical path Analysis &PERT analysis- PERT-Distinction between PERT and CPM .

TEXT BOOK:

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

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.

QUESTION PATTERN

Time: 3Hrs
Max. Marks:75

Section – A
5x2=10 (Answer ALL Questions)
(Each unit has one question)

Section – B
3x5=15 (Answer any THREE Questions (Out of five))
(Each unit has one question)

Section – C
5x10=50 (Answer ALL Questions (Either or Type))
(Each unit has two questions)

QUESTION PATTERN (ALLIED MATHEMATICS –I &II)

Time: 3Hrs
Max. Marks:75

Section – A
Answer ALL Questions
5x3=15 (Each unit has one question)

Section – B
Answer ALL Questions (Either or Type)
5x6=30(Each unit has two Questions)

Section – C
Answer any THREE Questions (3 Out of five)
3x10=30(Each unit has one question)