PG and Research Department of Mathematics conducted Board of Studies Meeting on 16-02-2018 at 10.00 am to discuss about syllabi for UG ,PG and M.Phil courses.

Syllabi for UG , PG and M.Phil courses were already framed by the faculty members and the same is brought to the notice of the board members, the Chairman, University Nominee.

UG Board:
The following members discussed on the syllabi for UG Course,

Chairman:
  Mr.J.JonArockiaraj,M.Sc.,M.Phil.,B.Ed.,PGDCA.,
  Head, Department of Mathematics,
  St.Joseph's College of Arts &Science(Autonomous),
  Cuddalore-1.

University Nominee:
  Dr. S.R. Kannan, M.Sc., M.Phil, Ph.D.
  Associate Professor in Mathematics,
  Pondicherry University,
  Puducherry.
  Ph:9865707773
  Email:srkannan.mat@pondiuni.edu.in

Subject Expert:
  Dr. G. Rajasekar M.Sc., M.Phil, Ph.D.
  Associate Professor in Mathematics,
  Jawahar Science College,
  Neyveli.
  Ph:9443051420
  Email:grsmaths@gmail.com

Alumni **:**
  Dr. S. Srinivasan, M.Sc., M.Phil, Ph.D.
  Asst. Professor in Mathematics,
  Periyar Arts College,
  Cuddalore.

Members of the Board:
  1. Mr.T.Henson
  2. Mrs. A.Arokiamary
  3. Mr.S.JohnsonSavarimuthu
  4. Mr.A.Venkatesan
  5. Mr. A.Rajesh
  6. Dr. S.Anjal Mose

B. Sc .MATHEMATICS
CURRICULUM DESIGN TEMPLATE

Year/ Sem	Subject	SUB CODE	Paper	Title of the paper	Hrs	Credits
I YEAR/ I SEM	Language	LT101S	I	**LANGUAGE/HINDI/FRENCH – I**	4	3
	English	LE101T	I	**ENGLISH – I**	4	3
	Core	MT101S	I	**ALGEBRA & TRIGNOMETRY**	5	4
	Core		II	**ANALYTICAL GEOMETRY AND THREE DIMENSION**	6	4
	Allied	ASMT101P	I	**MATHEMATICAL STATISTICS I**	8	4
	Foundation courses	VE101T	I	**VALUE EDUCATION**	3	2
I YEAR/ II SEM	Language	LT202T	II	**LANGUAGE/HINDI/FRENCH – II**	4	3
	English	LE202T	II	**ENGLISH – II**	4	3
	Core	MT203S	III	**CALCULUS**	6	4
	Core	MT204S	IV	**NUMERICAL METHODS AND COMPUTER APPLICATION**	5	4
	Allied	ASMT202T	II	**MATHEMATICAL STATISTICS II**	8	4
				MATHEMATICAL STASTICS –II (PRACTICAL)		2
	Foundation courses	EPD201T	II	**DYNAMICS OF PERSONALITY DEVELOPMENT.**	3	2
II YEAR/ III SEM	Language	LT303T	III	**LANGUAGE/HINDI/FRENCH – III**	4	3
	English	LE303T	III	**ENGLISH – III**	4	3
	Core	MT305S	V	**DIFFERENTIAL EQUATIONS**	5	4
	Core	MT306S	VI	**VECTOR AND FOURIER ANALYSIS**	6	4
	Allied(Optional)	ACMT301S	III	**FINANCIAL ACCOUNTNG/COST&MANAGEMENT ACCOUNTING**	4	4
	Foundation courses	EVS301S	III	**FIRST AID**	3	4
II YEAR/ IV SEM	Language	LT404T	IV	**LANGUAGE/HINDI/FRENCH – IV**	4	3
	English	LE404	IV	**ENGLISH – IV**	4	3
	Core		VII	**FUZZY SETS AND APPLICATIONS**	6	4
	Core	MT408	VIII	**GRAPH THEORY**	5	4
	Allied(Optional)	APH401S	IV	**PHYSICS**	8	4
				PHYSICS (PRACTICAL)		2
	Foundation courses	EVE401S	III	**ENVIRONMENTAL SCIENCE**	3	2
IIIYEAR/ V SEM	Core	MT509	IX	**ABSTRACT ALGEBRA**	6	5
	Core	MT510	X	**REAL ANALYSIS –I**	6	5
	Core	MT511	XI	**COMPLEX ANALYSIS – I**	6	5
	Elective -I		XII	**MECHANICS / A SPECIAL FUNCTIONS**	6	5
	Elective-II	EMT513S & EMT513A	XIII	**MAT-LAB** / Theory of fuzzy number system	6	5
IIIYEAR/ VI SEM	Core	MT614	XIV	Linear Algebra	6	5
	Core	MT615	XV	Real Analysis-II	6	5
	Core	MT616	XVI	**COMPLEX ANALYSIS- II**	6	5
	Elective-III	EMT617	XVII	**PROGRAMMING IN C LANGUAGE / MATHEMATICAL MODELING**	4	5
		MTP601		**PROGRAMMING IN C LANGUAGE – PRACTICLE**	2	2
	Elective-IV	EMT618S& EMT618A	XVIII	**OPERATIONS RESEARCH / ASTRONOMY**	6	5

TOTAL CREDITS = 138+ 2(EXTENSION)=140

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.

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 $\cos n\theta$, $\sin n\theta$- Expansion of $\tan n\theta$ in terms of $\tan\theta$- 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 $\sin\theta$, $\cos\theta$ and $\tan\theta$ 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	MT102P
SEMESTER – I	**For the students admitted from the year 2018**	HRS/WK – 6
CORE – 2		CREDIT – 4

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

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 BOOKS:
1.T.K.Manicavachagom Pillay & T. Natrajan (2011), "Analytical Geometry, part I-Two Dimensions", S.Viswanathan Printers & Publishers Pvt.Ltd. Chennai.
    Unit-I: Chapter: 6,6.1,7,7 – 7.2,8,13,3,3.1
2. 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)	**CALCULUS** **For the students admitted from the year2014**	MT203S
SEMESTER – II		HRS/WK – 6
CORE – 3		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.

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 AND COMPUTER APPLICATION For the students admitted from the year 2015	MT204S
SEMESTER – II		HRS/WK – 5
CORE – 4		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.

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)		MT305S
SEMESTER – III	**DIFFERENTIAL EQUATIONS**	HRS/WK - 5
CORE – 5	**For the students admitted from the year 2014**	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.

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)		MT306S
SEMESTER - III	**VECTOR AND FOURIER ANALYSIS** **For the students admitted from the year 2014**	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.

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	MT407S
SEMESTER – IV	**For the students admitted from the year 2017**	HRS/WK – 6
CORE – 7		CREDIT – 4

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

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

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

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

Unit IV : Fuzzy 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

II – B.Sc (Maths)		MT408
SEMESTER – IV	**GRAPH THEORY**	HRS/WK - 5
CORE – 8	**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.

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

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		MT510
SEMESTER –V	**REAL ANALYSIS- I**	**Hrs / Week: 6**
CORE –X	**For the students admitted from the year 2008**	**Credit: 5**

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, 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		MT511
SEMESTER –V	**COMPLEX ANALYSIS-I**	**Hrs / Week: 6**
CORE –XI	**For the students admitted from the year 2008**	**Credit: 5**

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

YEAR – III		EMT 512S
SEMESTER –V	**MECHANICS**	**Hrs / Week: 6**
ELECTIVE-I	**For the students admitted from the year 2017**	**Credit: 5**

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

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, (19th Ed) .

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

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

Objectives :

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

UNIT-I Properties of Linear Operators - Simultaneous Linear Differential Equations –

UNIT-II Special Solvable Types of Nonlinear Equations. Numerical Solutions Using Taylor Series –

UNIT-III Adams and Modified Adams Method - Extrapolation with Differences Properties of Power Series - Examples

UNIT-IV Singular Points of Linear Second Order Differential Equations - Method of Frobenius.

UNIT-V Bessel Functions - Properties – Legendre Functions.

Recommended Text

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

Reference Books

1. J.N.Sharma and R.K.Gupta (1998) Special Functions, Krishna PrakashanMandir, Meerut.

2. SatyaPrakash. (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: 6**
ELECTIVE-II	For the students admitted from the year 2014	**Credit: 5**

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.

Chapter 1: 1.1 – 1.6 **Chapter 2:** 2.1 – 2.2

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.

Chapter 3: 3.1 – 3.6

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.

Chapter 7 : 7.1 – 7.6

UNIT – IV   POLYNOMIALS, CURVE FITTING AND INTERPOLATION

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

Chapter 8: 8.1 – 8.4

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.

Chapter 10: 10.1 – 10.4

Text Book :   **MATLAB An Introduction with Applications**

AMOS GILAT – John wiley & sons, INC

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**

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: A.Kaufmann "Introduction to the Theory of fuzzy

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

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		MT615
SEMESTER –V	**REAL ANALYSIS-II**	**Hrs / Week: 6**
CORE-XIV	**For the students admitted from the year 2008**	**Credit: 5**

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

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

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

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

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

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

TEXT BOOK:
1."Complex Variables and Applications", James Ward Brown, Ruel V. Churchill, McGraw – Hill International Edition(2009).
 Unit-I: Chap:4 (Sec:4.48-4.54)
 Unit-II: Chap:5(Sec: 5.55-5.62,5.66), Unit-III:Chap:6(Sec:6.68-6.76)
 Unit-IV:Chap:7(Sec:7.78-7.81,7.85-7.87)
 Unit-V: Chap:8(Sec:8.90-8.95), Chap:9(Sec:9.101)

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

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

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)s

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	MTP601
SEMESTER –VI		Hrs / Week: 2
MAIN	**For the students admitted from the year 2014**	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		EMT617A
SEMESTER –VI	**MATHEMATICAL MODELLING**	Hrs / Week: 6
ELECTIVE-III (OPTIONAL)	(Optional Paper) For the students admitted from the year 2017	Credit: 5

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

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

TEXT BOOK(S)

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

REFERENCE(S)

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

YEAR – III		EMT618S
SEMESTER –VI	**OPERATIONS RESEARCH**	**Hrs / Week: 6**
ELECTIVE-IV	**For the students admitted from the year 2014**	**Credit: 5**

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

ELECTIVES-XVII

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		AMCS101T
SEMESTER – I	**ALLIED MATHEMATICS – I**	HRS/WK – 8
ALLIED – 1	**For the students admitted from the year 2014**	CREDIT – 5

(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.

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 – 5

(For B.C.A. I – Year)

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		AMT101T
SEMESTER – I	ALLIED MATHEMATICS – I For the students admitted from the year 2015	HRS/WK - 6
ALLIED- 1		CREDIT - 5

<div align="center">(For B.Sc. Physics & Chemistry)</div>

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

YEAR – I		AMCS202S
SEMESTER – II	**ALLIED MATHEMATICS – II**	HRS/WK - 6
ALLIED – 2	**For the students admitted from the year 2014**	CREDIT - 5

(For B.Sc Computer Science)

UNIT-I: LAPLACE TRANSFORMS
  Laplace Transformations of standard functions and properties – Inverse Laplace transforms.

UNIT-II:LAPLACE TRANSFORM(CONTD)
Applications to solutions of linear differential equations of order 1 and 2.

UNIT-III:VECTOR DIFFERENTIATION
Scalar point functions-Vector point functions-Gradient-Divergence-Curl-Directional Derivatives-Unit to normal to a surface.

UNIT-IV: VECTOR INTEGRATION
Gauss, Stoke's and Green's theorems [without proofs].

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

TEXT BOOK:
1.P. Duraipandian and S. Udayabaskaran(1997), "Allied Mathematics", Vol I & II. Chennai.Muhil Publishers.
Unit-I: Sec(7.1.1-7.1.4,7.2,7.2.1,7.2.2,7.2.3),
   Unit-II:Sec(7.3), Unit-III:Sec(8.1,8.1.1,8.2,8.3,8.3.1,8.3.2,8.4,8.4.1,8.4.2,8.4.3,8.4.4),
   Unit-IV: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 Delhi:
 S. Chand & Co Ltd.

YEAR – I	ALLIED MATHEMATICS – II	AMT202S
SEMESTER – II	For the students admitted from the year 2015	HRS/WK - 6
ALLIED- 1I		CREDIT - 5

(For B.Sc Physics & Chemistry)

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		AMTCA302
SEMESTER - III	**NUMERICAL METHODS** **For the students admitted in the year 2008**	**HRS/WK – 8**
Allied-2		**CREDIT – 5**

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.

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 – 5

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 BOOKS:
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	AMCM401
SEMESTER - IV	For the students admitted from the year 2014	HRS/WK – 5
ALLIED		CREDIT – 4

(For B.COM. II – Year)
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

(For BBM. II – Year)
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)		
SEMESTER - IV	RESOURCE MANAGEMENT TECHNIQUES	HRS/WK - 5
ALLIED -1	For the students admitted from the year 2017	CREDIT – 4

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 BOOKS:
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 have one question)

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

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

QUESTION PATTERN (ALLIED MATHEMATICS –I &II)

Time: 3Hrs
Max. Marks:75

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

Section – B
Answer ALL Questions (Either or Type)
5x6=30(Either or type Each unit one Question)

Section – C
Answer any THREE Questions (3 Out of five)
3x10=30(3 out of 5 Each unit have each question)