HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)
COIMBATORE - 641 028

BSC. MATHEMATICS
SCHEME OF EXAMINATIONS-CBCS PATTERN

(For the Students admitted from the Academic year 2016 - 2017 and onwards)

CODE NO	SUBJECT	LECTURE HRS/ WEEK	EXAM DURATION HRS	MAXIMUM MARKS			CREDIT POINTS
				IE	EE	TOTAL	
First Semester							
Part I							
16LAT01 / 16LAH01/ 16LAM01/ 16LAF01	Tamil-I /Hindi-I/Malayalam-I/French - I	6	3	25	75	100	3
Part II							
16ENG01	English – I	6	3	25	75	100	3
Part III							
16MAU01	Classical Algebra	6	3	25	75	100	4
16MAU02	Calculus	6	3	25	75	100	4
16MAU03	**Allied :** Mathematical Statistics-I (**Mat**)	6	3	25	75	100	4
Second Semester							
Part I							
16LAT02 / 16LAH02/ 16LAM02/ 16LAF02	Tamil-II/Hindi-II/Malayalam-II/French-II	6	3	25	75	100	3
Part II							
16ENG02	English – II	6	3	25	75	100	3
Part III							
16MAU04	Analytical Geometry	5	3	25	75	100	4
16MAU05	Trigonometry, Vector Calculus and Fourier Transforms	6	3	25	75	100	4
16MAU06	**Allied :** Mathematical Statistics-II (**Mat**)	5	3	25	75	100	4
Part IV							
16GSU01	Value Education- Human Rights	2	-	100	-	100	2
Third Semester							
Part I							
16LAT03 / 16LAH03/ 16LAM03/ 16LAF03	Tamil-III/Hindi-III/Malayalam-III / French-III	5	3	25	75	100	3
Part II							
16ENG03	English – III	6	3	25	75	100	3

	Part III						
16MAU07	Statics	4	3	25	75	100	4
16MAU08	Differential Equations and Laplace Transforms	4	3	25	75	100	4
16MAU09	Programming in C	2	3	25	75	100	3
16MAU10	Practical I : Programming in C	2	3	40	60	100	3
16MAU11	**Allied :** Accountancy - I (**Com**)	4	3	25	75	100	4
Part IV							
16GSU02	Environmental Studies	2	-	100	-	100	2
Fourth Semester							
Part I							
16LAT04 / 16LAH04/ 16LAM04/ 16LAF04	Tamil-IV /Hindi-IV/Malayalam-IV / French - IV	6	3	25	75	100	3
Part II							
16ENG04	English - IV	6	3	25	75	100	3
Part III							
16MAU12	Dynamics	4	3	25	75	100	4
16MAU13	Discrete Mathematics	4	3	25	75	100	4
16MAU14	Mathematical Softwares	2	3	25	75	100	2
16MAU15	Practical II : Mathematical Softwares	2	3	40	60	100	2
16MAU16	**Allied** : Accountancy - II (**Com**)	4	3	25	75	100	4
Part IV							
16GSU03	Skill Based : Internet Security	2	-	100	-	100	2
Part V							
16GSU04	Extension Activity	-	-	100	-	100	2
Fifth Semester							
Part III							
16MAU17	Real Analysis- I	6	3	25	75	100	5
16MAU18	Complex Analysis-I	6	3	25	75	100	4
16MAU19	Modern Algebra-I	6	3	25	75	100	4
16MAU20	Operations Research-I	6	3	25	75	100	4
16MAU21	**Elective I :** a)Numerical Methods-I (OR) b)Astronomy-I	6	3	25	75	100	4
Part IV							
16GSU05	**Non Major Elective:** General Awareness	-	-	100	-	100	2
Part V							
16GSU06	Law of Ethics	-	-	100	-	100	2
Sixth Semester							
Part III							
16MAU22	Real Analysis- II	5	3	25	75	100	5
16MAU23	Complex Analysis-II	5	3	25	75	100	4
16MAU24	Modern Algebra-II	5	3	25	75	100	4
16MAU25	Operations Research-II	5	3	25	75	100	4
16MAU26	Fuzzy sets and Fuzzy Logic	5	3	25	75	100	4
16MAU27	**Elective -II :** a) Numerical Methods-II (OR) b) Astronomy-II	5	3	25	75	100	4

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Code No	Subject	Semester No
16MAU01	**CLASSICAL ALGEBRA**	I
Objective:	To gain knowledge about the convergence of series and solving equations.	

Unit No	Topics	Hours
Unit I	**Binomial Theorem** Binomial – Positive integral index and Exponential theorems – their statements and proofs – their immediate application to summation and approximation only. **Chapter: 3 & 4**	14
Unit II	**Logarithmic Series** Modulus of a real number limit of a sequence – upper and lower limit of a sequence – Logarithmic series theorem – Summation and approximation. **Chapter : 4**	14
Unit III	**Convergence and Divergence** Convergence and Divergence of series – Definitions, elementary results comparison tests – Cauchy's tests. Absolute convergence – series of positive terms – Cauchy's condensation test – Raabe's test. **Chapter : 2**	14
Unit IV	**Theory of equations** Fundamental theorem of algebra – Roots of an equation – Relations connecting the roots and coefficients – certain standard transformations – Descarte's rule of signs – symmetric function of roots – Reciprocal equations. **Chapter :6**	15
Unit V	**Roots of equation and approximation** Newton's method of approximation to a root – Horner's method. Multiple roots – Rolle's theorem – position of real roots of $f(x) = 0$. **Chapter :6**	15

Text Book:

1. Manicavachagom Pillai .T.K., Natarajan .T, Ganapathy .K.S. – "Algebra Vol I ", S. Viswanatham -(Printers & Publishers Private Ltd-2006).

Reference Books:

1. Kandasamy .P and Thilagavathy .K – "Mathematics for B.Sc. Branch I -Vol. I- (For B.Sc-I semester)", S. Chand and Company Ltd, New Delhi, 2004.

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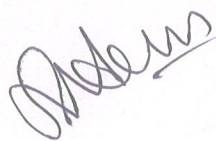Hindusthan College of Arts & Science,
Coimbatore - 641 028

Code No	Subject	Semester No
16MAU02	CALCULUS	I
Objective:	To gain the knowledge about curvature and integration of variables	

Unit No	Topics	Hours
Unit I	**Curvature of Plane Curves** Curvature – Circle, radius and centre of curvature – Cartesian formula for the radius of curvature – The coordinates of the centre of curvature – Evolutes and involutes – Radius of curvature when the curve is given in polar co-ordinates – Pedal equation of a curve. **Chapter 10 : 2.1-2.7**	14
Unit II	**Integration** Integration of irrational functions – Properties of definite integrals – Integration by parts – Reduction formulae. **Chapter 1 :8,11,12,13**	14
Unit III	**Multiple Integrals** Evaluation of the double integral – Change of order of integration – Double integral in polar co-ordinates – Triple integrals – Applications of Multiple integrals . **Chapter 5 : 1,2,2.1,2.2,3.1,4,5.1,5.2,5.3,5.4**	14
Unit IV	**Change of Variables** Jacobian – Two important results regarding Jacobians – Change of variables in the case of two variables – Change of variables in the case of three variables. **Chapter 6 : 1,2,2.1,2.2**	15
Unit V	**Improper Integrals** Beta and Gamma functions – Recurrence formula for Gamma functions – Properties of Beta functions – Relation between Beta and Gamma functions – Applications of Gamma functions to multiple integrals. **Chapter 7 : 2.1,2.2,2.3,3,4,5,6**	15

Text Books :

1. Narayanan.S and Pillai .T.K.M. – "Calculus, Vol 1", Viswanathan Publishers, 2007. For Unit I
2. Narayanan.S and Pillai .T.K.M., – "Calculus, Vol 2" , Viswanathan Publishers, 2007.For Units II to V

Reference Book:
1. Kandasamy .P & Thilagarathy .K –"Mathematics for BSc – Vol I and. II", S.Chand and Co-2005

Code No	Subject	Semester No
16MAU03	**ALLIED : MATHEMATICAL STATISTICS - I**	I
Objective:	To apply Statistics Methods for Mathematical Problems	

Unit No	Topics	Hours
Unit I	**Probability** Definition of Probability (Classical, Statistical and Axiomatic) – Addition and Multiplication laws of Probability – Independence of Events – Conditional Probability – Baye's Theorem – Simple Problems Chapter 3 : 3.4, 3.4.1 ,3.5 ,3.5.1, 3.8.5, 3.9.1, 3.11, 3.12 Chapter 4 : 4.2,4.2.1	14
Unit II	**Mathematical Expectation** Random Variables (Discrete and Continuous) – Distribution Function – Expectation and Moments – Moment Generating Function – Probability Generating Function – Simple Problems. Chapter 5 : 5.2,5.3,5.4,5.4.1 Chapter 7 : 7.1,7.1.2, 7.9,7.9.1	14
Unit III	**Chebychev's inequality** Cumulants – Properties of Cumulants – Characteristic Function – Properties – Chebychev's Inequality – Simple Problems in Chebychev's inequality. Chapter 7 : 7.2,7.2.1, 7.3,7.3.1, 7.5	14
Unit IV	**Correlation and Regression** Concept of Bivariate Distribution – Correlation – Karl Pearson's Coefficient of Correlation – Rank Correlation – Linear Regression Chapter 10 : 10.1,10.2,10.3,10.4,10.4.1, 10.7,10.7.1,10.7.2,10.7.3 Chapter11:11.1,11.2,11.2.1,11.2.2	15
Unit V	**Probability Distribution function** Standard distributions: Discrete distributions – Binomial, Poisson – Continuous Distributions – Normal. Exponential Distributions . Chapter 8 : 8.4,8.4.1,8.4.2,8.4.6,8.5,8.5.2,8.5.4,8.5.5 Chapter 9 : 9.2,9.2.1,9.2.2,9.2.3,9.2.4,9.2.6,9.2.7,9.8,9.8.1	15

Text Book:
1. Gupta .S.C. & Kapoo .V.K. – "Fundamentals of Mathematical Statistics", Sultan & sons publications.

Reference Book:
1. Hogg .R.V. & Craig .A.T. – "Introduction to Mathematical Statistics", Macmillan,publications(1998).

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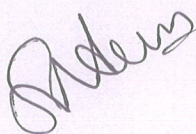Hindusthan College of Arts & Science,
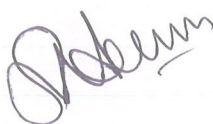Coimbatore - 641 028

Code No	Subject	Semester No
16MAU04	**ANALYTICAL GEOMETRY**	**II**
Objective:	On successful completion of the course students should have gained knowledge about the regular geometrical figures and their properties.	

Unit No	Topics	Hours
Unit I	**2 -Dimensional Geometry** Polar coordinates – Conic – Parabola, Ellipse, Hyperbola – Chord, Tangent and Normal – simple problems. **Chapter 9 : 9.1, Chapter 5 : 5.1 -5.7, Chapter 6 : 6.1 -6.6**	12
Unit II	**3- Dimensional Geometry** Equation of a straight line – conditions for various situations of a line – projection of a line – coplanarity of two lines – Shortest distance (S.D) and equation of S.D between two skew lines –simple problems only. **Chapter 4 : 4.1 -4.6**	12
Unit III	**Sphere** Equation of a sphere – Standard equation of a sphere results based on the properties of a sphere – tangent plane to a sphere – simple problems. **Chapter 5 : 5.1 -5.4**	12
Unit IV	**Cone and cylinder** Cone – Equation of a Cone – Equation of a Cone whose vertex is at the origin – Quadratic Cone with vertex at the origin. Cylinder: Equation of a Cylinder – Quadratic surfaces. **Chapter 6 : 6.1 – 6.7**	12
Unit V	**Conicoids** Notation – Enveloping cone tangent plane – simple problems. **Chapter 6 : 6.9 – 6.12**	12

Text Book:

1. Durai Pandian.P & others – "Analytical Geometry (2- Dimensional)"(Unit I).

2. Durai Pandian.P & others – "Analytical Geometry (3 – Dimensional)" (Unit II ,III ,IV , V).(2003)

Reference Book:

1. Pillai .T.K.M. and Others – "Analytical Geometry of 2D" ,Visvanathan Publications-2006.

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Code No	Subject	Semester No
16MAU05	TRIGONOMETRY, VECTOR CALCULUS AND FOURIER TRANSFORMS	II
Objective:	To gain knowledge about expansion of trigonometric functions, line integral, surface integral, volume integral and Fourier series.	

Unit No	Topics	Hours
Unit I	**Expansion Series** Expansion of $\cos n\theta$, $\sin n\theta$, in a series of cosines and sines of multiples of θ – Expansions of $\cos n\theta$ and $\sin n\theta$ in powers of sines and cosines – Expansion of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in powers of θ – Hyperbolic functions and Inverse Hyperbolic functions **Chapter 3 : 1,2,3,4,5**	14
Unit II	**Logarithm of complex quantities** Logarithm of complex quantities – Summation of series – when angles are in arithmetic progression – C + is method of summation – method of differences. **Chapter 5 : 5 , Chapter 6 : 1,2**	14
Unit III	**Scalar and vector fields** Differentiation of vectors – Gradient. Divergence and Curl – Simple Problems. **Chapter 1 and 2**	14
Unit IV	**Integration of vectors** Line integral – surface integral – Green's theorem in the plane – Gauss divergence theorem – Strokes theorem – Statements only – Simple Problems. **Chapter 3 :3.1-3.5 , Chapter 4: 4.1,4.2,4.4,4.5**	15
Unit V	**Fourier Transforms** Definition – finding Fourier coefficient for a given periodic function with period 2π – odd and even functions. Change of Interval. **Chapter 6 :1,2,3**	15

Text Books :

1. *Manicavasagom Pillai .T.K . and Narayanan .S– "Trigonometry"– Viswanathan Publishers and PrintersPvt Ltd (Unit I and II)*

2. *Duraipandian .P , Laxmiduraipandian – "Vector Analysis" (Revised Edition – Reprint 2005) EmeraldPublishers. (Unit III and IV)*

3. *Manicavasagom Pillai.T.K. and Narayanan .S – "Calculus Volume – III". S.Viswanatham Printers,2007.(Unit V)*

Reference Book:

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

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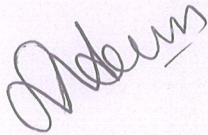Hindusthan College of Arts & Science,
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Code No	Subject	Semester No
16MAU06	ALLIED : MATHEMATICAL STATISTICS-II	II
Objective:	To apply Statistics for Mathematical problems	

Unit No	Topics	Hours
Unit I	**Sampling** Statistical Population Census and Sampling Survey – Parameter and Statistics – Sampling and Sampling Distribution and Standard Error. **Chapter :8**	12
Unit II	**Test of significance** Large sample test for proportion, mean and standard deviation – Exact test based on 't', Chi – square and F distribution with respect to population mean, variance and correlation coefficient. **Chapter14: SecNo:14.1;14.2–14.2.4;14.6;14.7–14.7.2;15.6–15.6.2;16.1;16.2 – 16.2.1; 16.3 – 16.3.2; 16.6.1 – 16.6.3.**	12
Unit III	**Point estimation and Cramer-Rao inequality** Point estimation – Concept of unbiasedness , consistency, efficiency and sufficiency – Cramer – Rao Inequality – Methods of Estimation –Maximum Likelihood Estimation – Method of Moments. **Chapter17: Sec No :17.1;17.2.1-17.24;17.3-17.31;17.6-17.6.2.**	12
Unit IV	**Test of Hypothesis** Null and Alternate Hypothesis – Type I and Type II error – Power of the test – Neymann Pearson lemma – Likelihood Ratio Test – Concept of Most Powerful test (Statement and Results only) –Simple Problems. **Chapter 18: Sec No:18.2.1-18.2.7, 18.3, 18.4-18.4.2,18.5-18.5.1**	12
Unit V	**Analysis of Variance** Analysis of Variance – One - way and Two-way Classification – Basic Principles of Design of Experiments – Randomization, Replication, Local Control, Completely Randomized Design. **Chapter : 15 & 16**	12

Text Books:

1. Gupta.S.C. & Kapoor.V.K. – "Fundamentals of Mathematical Statistics", Sultan & sons publications.
2. Kailasam.C & Gangai selvi.R – "Applied Statistics".

Reference Book:

1. Hogg R.V. & Craig.A.T. – "Introduction to Mathematical Statistics", Macmillan (1998).

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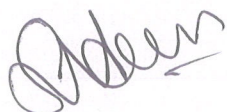Hindusthan College of Arts & Science,
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Code No	Subject	Semester No
16MAU07	STATICS	III
Objective:	To gain knowledge about the system of forces	

Unit No	Topics	Hours
Unit I	**Kinematics** Mechanics, Units, Vector and Scalar quantities, A vector as a sum of three mutually perpendicular vectors, A vector as a sum of two non – perpendicular vectors. **Forces** Force, types of forces, magnitude and direction of the resultant of forces acting on a particle (in particular resultant of two forces acting on a particle), equilibrium examples. **Equilibrium of a particle** Equilibrium of a particle acted on a rough inclined plane, examples. **Chapter 1: Section 1 – 5, Chapter 2 and Chapter6**	10
Unit II	**Forces on a rigid body** Moment of a vector, General motion of rigid body, equivalent or equipotent systems of forces, resultant of parallel forces, couple, resultant of several coplanar forces. **Chapter 7: Section 7.1 – 7.6**	10
Unit III	**Forces on a rigid body** Moment of the resultant force, couples in a plane or in parallel planes, resultant of a couple and a force, three coplanar forces on a rigid body, equation of the line of action of the resultant, equilibrium of a rigid body under three coplanar forces examples. **Chapter 7 : Section 7.1 -7.12**	10
Unit IV	**A specific reduction of a System of forces** Reduction of a system of forces to a force at a chosen point and a couple, central axis, problems involving frictional force, problems involving tilting of bodies, examples. **Chapter 8**	9
Unit V	**Stability of Equilibrium and Hanging strings** Equilibrium of a uniform homogeneous string, sag, suspension bridge, examples **Chapter 10 and 11**	9

Text Book:
1. Duraipandian.P and others – "Mechanics" S.Chand & Co., 1990.

Reference Book:
1. Venkataraman.M.K. – "Statics", Agasthiar Publications, Trichy, 1999.

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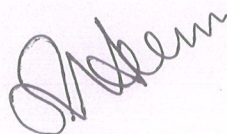Hindusthan College of Arts & Science,
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Code No	Subject	Semester No
16MAU08	DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	III
Objective:	To gain knowledge about differential equations and laplace transforms	
Unit No	Topics	Hours
Unit I	**Differential Equations** Differential Equations of Non homogeneous equations- Bernoulli's equation. Differential Equations of the first order, but of the higher degree – Equations solvable for dy/dx – Equations solvable for y– Equations solvable for x **Chapter 1:2.3-2.5, 5.1-5.4**	10
Unit II	**Differential Equations** Linear differential equations with constant coefficients – special methods of finding particular integral – Linear equations with variable coefficients – Equations reducible to the linear homogeneous equations. **Chapter 2 : 1 -4,8,9**	10
Unit III	**Differential Equations** Simultaneous equations of the first order and first degree – Methods for solving dx/P=dy/Q=dz/R simultaneous linear differential equations with constant coefficients. **Chapter 3 : 1,2,4,6**	10
Unit IV	**Partial Differential Equations** Derivation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Different integrals of partial differential equations – Lagrange's equations **Chapter 4 :1,2,3, 4,6.**	9
Unit V	**Laplace Transforms** Laplace transforms – Definition – Transform of f(t), – expat, Cos at, Sin at and t ^{n} when n is an integer. **Chapter 5: 1,2,4**	9

Text Book:

1. Manicavachagam Pillay.T.K., Narayanan.S – "Calculus Vol. III" S.Viswanathan Printers, 2007.

Reference Book:

1. Bali.N.P. – "Differential Equations", Laxmi Publication Ltd, New Delhi, 2004

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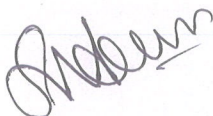| Code No	Subject	Semester No
16MAU09	PROGRAMMING IN C	III
Objective:	To gain knowledge about the C programming language	
Unit No	Topics	Hours
Unit I	**Introduction** Importance of C Basic structure of C programme – Character set – Constants – Keywords and identifiers – Variables Data types – Declaration of variables – Assigning values to variables –Defining symbolic constants. **Chapter 1:1.2,1.8, chapter2: 2.1-2.11.**	5
Unit II	**Operators and expressions** Arithmetic operators – Relational operators – logical operators – assignment operators –increment and decrement operates – Conditional operators – Special operators – Arithmetic expressions –Evaluation of expressions – Precedence of arithmetic operators – Some computational problems –Type conversion in expressions – operator precedence and associating mathematical functions. Chapter3: 3.1 -3.15. **Chapter 4:4.2-4.5.**	5
Unit III	**Branching & Looping** Reading and Writing character – formatted input and 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 ? Operator – The GOTO statement. The WHILE statement – the DO statement the FOR statement –Jumps in loops. **Chapter 5: 5.1-5.9, Chapter6:6.2-6.5.**	5
Unit IV	**Arrays** One, Two dimensional arrays – Declaration of one-dimensional arrays – Initialization of one-dimensional arrays – Initiating two dimensional arrays – Multidimensional arrays **Chapter 7:7.1-7.7.**	5
Unit V	**Strings** Declaring and initializing string variables – reading strings from terminal – Writing strings on the screen – Arithmetic operations on characters **Chapter 8:8.1-8.5.**	4

Text Book :

1. Balagurusamy.E – "Programming in ANSI C" Second Edition – Tata McGraw – Hill Publishing company limited, New Delhi.
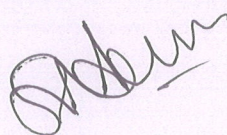
Reference Book:

1. Byron Gottfried – "Programming with C (Schaum's outline series)" – Tata Mc Graw Hill publishing company – 1998.

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Code No	Subject	Semester No
16MAU10	PRACTICAL I : PROGRAMMING IN C	III
Objective:	To gain knowledge about the C programming language	

1. Write a C program to generate 'N' Fibonacci number.

2. Write a C program to print all possible roots for a given quadratic equation.

3. Write a C program to calculate the statistical values of mean, median, mode, Standard Deviation and variance of the given data.

4. Write a C program to sort a set of numbers.

5. Write a C program to sort the given set of names.

6. Write a C program to find factorial value of a given number 'N' using recursive function call.

7. Write a C program to find the product of two given matrix.

8. Write a C program to prepare pay list for a given data.

9. Write a C program to find the number of palindromes in a given sentence.

10. Write a C program to search a required element in a list using binary search.

11. Write a C program that check whether a character entered by the user is a vowel or not.

12. Write a C program to find the factorial of a given number.

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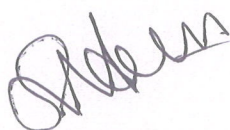| Code no	Subject	Semester No
16MAU12	DYNAMICS	IV
Objective:	To gain the knowledge about field kinematics, projectile, simple harmonic motion and impact of a particle on a surface.	

Unit No	Topics	Hours
Unit I	**Projectiles** Path of a projectile – Greatest height – time of flight – range on an inclined plane through the point of projection – Maximum range. **Chapter 1: Section 1.6 – 1.15, Chapter 3: Section 3.1 – 3.6.**	10
Unit II	**Central Orbits** Radial and transverse components of velocity and acceleration – areal velocity. Differential equation of central orbit – Pedal equations. **Chapter 5: Section 5.1 – 5.7**	10
Unit III	**Simple Harmonic Motion** Amplitude, periodic time, phase – composition of two simple harmonic motions of the same period in a straight line and in two perpendicular lines **Chapter 12: Section 12.1 – 12.9**	10
Unit IV	**Impact on a fixed surface** Impulsive force – Impact on a smooth fixed plane –Direct and oblique impact of two smooth spheres. **Chapter 13: Section 13.1 – 13.4, 13.6 – 13.11**	9
Unit V	**Kinetic energy** Loss of Kinetic energy during direct and oblique impacts **Chapter 14: Section 14.1 – 14.6, Chapter 15: Section 15.1 – 15.5**	9

Text book:

1. Duraipandian.P and others – "Mechanics" by S. Chand & Co., 1990.

Reference Book:

1. Dharamapadam.A.V. – "Dynamics", S.Viswanathan Printers and Publishers Pvt., Ltd, Chennai,1998.

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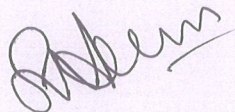| Code no	Subject	Semester No
16MAU13	DISCRETE MATHEMATICS	IV
Objective:	To gain knowledge about the Formal languages Automata Theory, Lattices & Boolean Algebra and Graph Theory.	

Unit No	Topics	Hours
Unit I	**Mathematica! logic** Connections well formed formulas, Tautology, Equivalence of formulas, Tautological implications, Duality law, Normal forms, Predicates, Variables, Quantifiers and bound Variables. Theory of inference for predicate calculus. **Chapter 1: 1 -2 Sections 1- 2.7 to 1 – 2.11,1-5.1 – 1-5.2,1-5.4,1-6.4**	10
Unit II	**Normal Forms** Disjunctive normal form – Conjunctive normal form – Principal disjunctive normal form – Principal conjunctive normal form – Ordering and uniqueness of normal form **Chapter 1: 1 -3 Sections1-3.1 to 1-3.5**	10
Unit III	**Relations and functions** Composition of relations, Composition of functions Inverse functions, one-to- one, onto, one-to-one& onto, onto functions, Hashing functions, Permutation function , Growth of functions. Algebra structures: Semi groups, Free semi groups, Monodies', Groups, Cosets, Sets, Normal subgroups, Homomorphism. **Chapter 2: 2 - 3 Sections 2-3.5,2-3.7,2-4.2,2-4.3,2-4.6**	10
Unit IV	**Formal languages and Automata** Regular expressions, Types of grammar, Regular grammar and finite state automata, Context free and sensitive grammars **Chapter 3: Sections 3- 3.1, 3-3.2,4-6.2**	9
Unit V	**Lattices and Boolean algebra** Partial ordering, Poset , Lattices, Boolean algebra, Boolean functions, Theorems, Minimization of Boolean functions. **Chapter 4: Sections 4-1.1,4-2,4-3,4-4.2**	9

Text Book:

1. Tremblay.J.P. and Manohar.R.P. – "Discrete Mathematical Structures with applications to computer science", Mc.Graw Hill, 1975.(unit I to V)

Reference Book:

1. Sharma.J.K. – "Discrete maths".

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PG & Research Dept. of Mathematics,
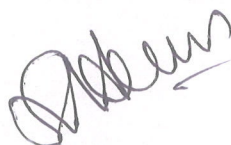Hindusthan College of Arts & Science,
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Code no	Subject	Semester No
16MAU14	MATHEMATICAL SOFTWARES	IV
Objective:	To gain knowledge about basic features of Mathematica and Matlab	
Unit No	Topics	Hours
Unit I	**Introduction** Introduction – Basics of Matlab , Input – Output, File types – Platform dependence – General Commands **Chapter1:Sections 1.6.1-1.6.6**	5
Unit II	**Interactive Computations** Matrices and Vectors – Matrix and Array Operations – Creating and Using Inline functions – Using Built-in Functions and Online Help –Saving and loading data – Plotting simple graphs. **Chapter3:Sections 3.1-3.2,3.5-3.8**	5
Unit III	**Introduction to Mathematica** Running Mathematica – Numerical Calculations – Building up Calculations ,Using Mathematical Systems . **Chapter1:Section1.0-1.3**	5
Unit IV	**Algebraic calculations** Algebraic Calculations – Symbolic Mathematics. Numerical Mathematics. **Chapter1:Sections 1.4-1.6**	5
Unit V	**Graphics** Functions and Programs – Lists – Graphics. **Chapter1:Sections 1.7-1.9**	4

Text Books:

1.Rudra Pratap – "Getting started with MATLAB" – Oxford university Press ,2003 (for Unit I and Unit II).
2.Stephen Wolfram – "The Mathematica Book", Fifth edition ,Cambridge University Press,2003 (for Unit III to Unit V).
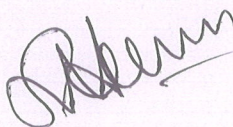
Reference Book:
1.William John Palm – "Introduction to MATLAB 7 for engineers", McGraw –Hill professional,2005.

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Code no	Subject	Semester No
16MAU15	PRACTICAL II : MATHEMATICAL SOFTWARES	IV
Objective:	To gain knowledge about basic features of Mathematica and Matlab	

MATHEMATICA PRACTICAL LAB LIST

1. Numerical Calculations

2. Mathematical Functions

3. Algebraic Calculations

4. Symbolic Mathematics

5. Symbolic Mathematics – Solving Equations

6. Graphics – Two dimensional plots.

MATLAB PRACTICAL LAB LIST

1 .Plotting a function.

2. Polar plot.

3. Addition of two matrices.

4. Finding the determinant of a matrix.

5. Finding Eigen values and Eigen vectors of a matrix.

6.Calculating mean, median, standard deviation, variance, maximum value, minimum

Value, range, skewness, and kurtosis.

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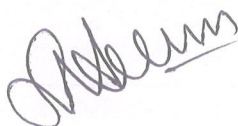Coimbatore - 641 028

Code no	Subject	Semester No
16MAU17	REAL ANALYSIS-I	V
Objective:	To gain the knowledge about real and complex numbers, sets and metric space.	
Unit No	Topics	Hours
Unit I	**Real and Complex Number System** The Real and Complex number systems – The field axioms – the order axioms – Geometrical representation of Real numbers – Intervals – Integers – Unique Factorization theorem for integers – Rational numbers – Irrational numbers – Upper bounds, Maximum elements, Least upper bound – The completeness axiom –some properties of the supermum – Rational numbers with finite decimal representation of real numbers – absolute values and the triangle inequality – the Cauchy – Schwarz inequality – plus and minus infinity and the extended real number system. **Sec.1.1 to 1.20**	14
Unit II	**Some basic notations of a set theory** Notations – ordered pairs – Cartesian product of two sets – Relations and functions – one-one functions and inverse – composite functions – sequences – similar(equinumerous) sets – finite and infinite sets – countable and uncountable sets – uncountability of the real number system – set algebra – countable collection of countable sets. **Sec. 2.1 to 2.15**	14
Unit III	**Elements of point set topology** Euclidean space R^n – open balls and open sets in R^n. The structure of open Sets in R^n – closed sets and adherent points – Accumulation points – The Bolzano – Weierstrass theorem –the Cantor intersection theorem. **Sec. 3.1 to 3.9**	14
Unit IV	**Covering Theorem** Lindelof covering theorem – the Heine Borel covering theorem – Compactness in R^n – Metric Spaces – point set topology in metric spaces – compact subsets of a metric space – Boundary of a set **Sec. 3.10 to 3.16**	15
Unit V	**Limits and continuity** Cauchy Sequences – Complete Metric Spaces, Limit of a function – Continuous Functions – Continuity of Composite functions. Continuous complex valued and vector valued functions. **Sec. 4.1, 4.3, 4.4, 4.5, 4.8, 4.9, 4.10**	15

Text Book:

1. Apostol.T.M. – "Mathematical Analysis", 2nd ed., Narosa Publishing Company,Chennai,1990.

References Book:
1. Goldberg.R.R. – "Methods of Real Analysis", N.Y,John Wiley,New York, 1976

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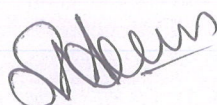Hindusthan College of Arts & Science,
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Code no	Subject	Semester No
16MAU18	COMPLEX ANALYSIS-I	V
Objective:	To gain knowledge about the origin, properties and application of complex numbers and complex functions.	

Unit No	Topics	Hours
Unit I	**Complex numbers** Complex number system, Complex number – Field of Complex numbers– Conjugation – Absolute value – Argument – Simple Mappings. i) w=z +α ii) w=az iii) w=1/z invariance of cross-ratio under bilinear transformation. **Chap I : Sec.1.1to 1.3, 1.6to 1.9, Chap II, Sec. 2.1 to 2.2, 2.6 to 2.9, Chap VII Sec. 7.1**	14
Unit II	**Complex functions** Limit of a function – continuity – differentiability – Analytical function defined in a region – necessary conditions for differentiability – sufficient conditions for differentiability – Cauchy-Riemann equation in polar coordinates – Definition of entire function. **Chap IV Sec. 4.1 to 4.10**	14
Unit III	**Power Series** Absolute convergence – circle of convergence – Analyticity of the sum of power series in the Circle of convergence (term term differentiation of a series) Elementary functions: Exponential, Logarithmic, Trigonometric and Hyperbolic functions. **Chap VI Sec. 6.1 to 6.11**	14
Unit IV	**Conjugate Harmonic functions** Definition and determination, Conformal Mapping, Isogonal mapping –Conformal mapping – Mapping z--->f(z), where f is analytic, particularly the mappings. w= e^z ; w = $z^{1/2}$; w=sin z ; w =1/2(z +1/z) **Chap VI, Sec. 6.12 to 6.13, Chap VII Sec. 7.6 to 7.9**	15
Unit V	**Complex Integration** Simply and multiply connected regions in the complex plane. Integration of f(z) from definition along a curve joining z_1 and z_2 – Proof of Cauchy's Theorem (using Goursat's lemma for a simplyconnected region). Cauchy's integral formula for higher derivatives (statement only) – Morera's theorem. **Chap VIII, Sec.8.1 to 8.9**	15

TextBook:

1. Duraipandian.P and Laxmi Duraipandian – "Complex Analysis", Emerald Publishers, Chennai –2

Reference Book:

1. Santhinarayan – "Theory of functions of Complex Variable", S.Chand and Company ,Meerut. 1995.

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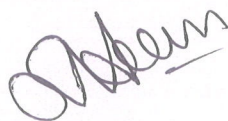Hindusthan College of Arts & Science,
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Code no	Subject	Semester No
16MAU19	MODERN ALGEBRA-I	V
Objective:	To gain knowledge about the sets, groups and rings by proving theorems.	

Unit No	Topics	Hours
Unit I	**Basic operations** Sets – mappings – Relations and binary operations – Groups: Abelian group, Symmetric group Definitions and Examples – Basic properties. **Chapter I Sec.1.1 to 1.3** **Chapter II Sec.2.1 to 2.3**	14
Unit II	**Groups** Subgroups – Cyclic subgroup – Index of a group – Order of an element – Fermat theorem – Normal Subgroups and Quotient Groups **Chapter II Sec.2.4 to 2.6**	14
Unit III	**More about Groups** Homomorphisms – Cauchy's theorem for Abelian groups – Sylow's theorem for Abelian groups – Cayley's theorem, permutation groups **Chapter II : Sec, 2.7 to 2.10**	14
Unit IV	**Rings** Definition and Examples –Some Special Classes of Rings – Commutative ring – Field – Integral domain – Homomorphisms of Rings. **Chapter III:Sec. 3.1 to 3.3**	15
Unit V	**Ideals** Ideals and Quotient Rings – More Ideals and Quotient Rings – Maximal ideal – The field of Quotients of an Integral Domain **Chapter III: Sec. 3.4 to 3.6**	·15

Textbook :
1. Herstein.I.N. – "Topics in Algebra", John Wiley York, 2003.

Reference Book:
1. Surjeet Singh and Qazi Zameeruddin –"Modern Algebra", Vikas Publishing house, 1992.

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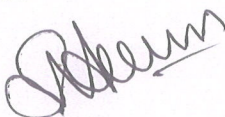Hindusthan College of Arts & Science,
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Code no	Subject	Semester No
16MAU20	OPERATIONS RESEARCH-I	V
Objective:	To gain knowledge about optimal use of resources.	

Unit No	Topics	Hours
Unit I	**Basics Of Operations Research** Origin and Development of O.R. – Nature and Characteristics of features O.R. – Models in O.R. – General solution methods for O.R models – Methodology of Operations Research – Scientific method in O.R – Operation research and decision making – Applications of O.R. – Uses and limitations of O.R. – Mathematical Formulation of Problem – Graphical Solution method – Some exceptional cases. Sec. 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.2, 2.3, 2.4	14
Unit II	**Methods to Solve LPP** Introduction – Fundamental properties of solution – The computational procedure – Simplex method – Artificial Variable techniques – Big-M method and Two phase method Sec. 3.1, 3.2, 3.3, 3.5	14
Unit III	**Duality and Linear programming** Concepts of duality – Formulation of primal dual Pairs – Duality theorems – Complementary Slackness Theorem – Duality and Simplex method – Dual Simplex method – Dual simplex algorithm Sec. 4.1,4.2, 4.3, 4.4, 4.5, 4.6, 4.7	14
Unit IV	**The Transportation Problem** Introduction – Mathematical formulation of the problem –Finding Initial Basic Feasible solution – Moving towards optimality – Transportation Algorithm – Unbalanced transportation problems Sec. 6.1, 6.2, 6.5, 6.6, 6.8, 6.9	15
Unit V	**The Assignment problems** Introduction – Mathematical formulation of an A.P. – Assignment algorithm Sec. 7.1, 7.2, 7.3	15

Textbook :

1. Kalavath.S – "Operations Research", Vikas publishing house pvt Ltd,Noida.

Reference book:

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

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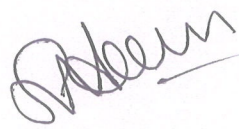Hindusthan College of Arts & Science,
Coimbatore - 641 028

Code no	Subject	Semester No
16MAU21	ELECTIVE I : a) NUMERICAL METHODS-I	V
Objective:	To gain the knowledge about solving the linear equations numerically and finding interpolation by using difference formulae	
Unit No	Topics	Hours
Unit I	**The solution of numerical Algebraic and Transcendental Equations** Bisection method – Iteration Method – Convergence condition – Regula Falsi Method – Newton – Raphson method – Geometrical meaning of Newton's method – Convergence Criteria – Order of Convergence. **Chapter 3:3.1-3.4.**	14
Unit II	**Solution of simultaneous linear Algebraic Equations** Gauss Elimination method – Gauss Jordan method – Method of Triangularization – Gauss Jacobi method – Gauss Seidel method **Chapter 4:4.1-4.4,4.8,4.9.**	14
Unit III	**Finite Differences** Differences – operators – forward and backward difference tables – Differences of a polynomial – Factorial polynomial – Error propagation in difference table – Finite integration **Chapter 5:5.1-5.6.**	14
Unit IV	**Interpolation (for equal intervals)** Gregory-Newton's forward and backward formulae – equidistant terms with one or more missing values – Central differences and central difference table – Gauss forward and backward formulae – Stirlings formula- advantages of central difference interpolation. **Chapter 6:6.1-6.3, Chapter 7:7.1-7.5.**	15
Unit V	**Interpolation (for unequal intervals)** Divided differences – Properties – Relations between divided differences and forward differences – Newton's divided differences formula – Lagrange's formula and inverse interpolation. **Chapter 8:8.1-8.7.**	15

Textbook:

1. *Kandasamy. P, Thilagavathi. K and Gunavathi. K – "Numerical methods" , S. Chand and Company Ltd, New Delhi – Revised Edition 2007. (Chapters: 3,4,5,6,7 and 8).*

Reference book:

1. *Venkataraman M. K. – "Numerical Methods in Science and Engineering", National publishing co. 5th edition,1999.*

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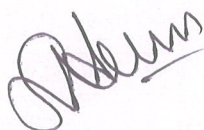Hindusthan College of Arts & Science,
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Code no	Subject	Semester No
16MAU21	ELECTIVE I : b) ASTRONOMY-I	V
Objective:	To enable the students to understand the Astronomical aspects and about the laws governing the planet movements.	

Unit No	Topics	Hours
Unit I	**Solar System** General description of the Solar system. Comets and meteorites – spherical trigonometry.	14
Unit II	**Coordinate System** Celestial sphere – Celestial co-ordinates – Diurnal motion – Variation in length of the day.	14
Unit III	**Geocentric Parallex** Dip – Twilight – Geocentric Parallex	14
Unit IV	**Tangent and Cassinis formula** Refraction – Tangent formula – Cassinis formula	15
Unit V	**Kepler's Law** Kepler's laws - Relation between true eccentric and mean anamolies.	15

Text Book:

1. Kumaravelu.S and Susheela Kumaravelu – "Astronomy".

Reference Book:

1. John Duncan – "Astronomy" Paragon Publishers.

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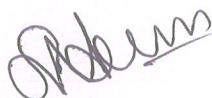Hindusthan College of Arts & Science,
Coimbatore - 641 028

Code no	Subject	Semester No
16MAU22	REAL ANALYSIS-II	VI
Objective:	To gain the knowledge about the nature of functions mappings.	

Unit No	Topics	Hours
Unit I	**Continuous Functions** Examples of continuous functions – continuity and inverse images of open or closed sets – functions continuous on compact sets – Topological mappings – Bolzano's theorem. **Sec. 4.11, 4.12, 4.13 to 4.15**	12
Unit II	**Connectedness** Components of a metric space – Uniform continuity: Uniform continuity and compact sets – fixed point theorem for contractions – monotonic functions. **Sec. 4.17, 4.19, 4.20 to 4.21, 4.23**	12
Unit III	**Derivatives** Definition of derivative – Derivative and continuity – Algebra of derivatives – the chain rule – one sided derivatives and infinite derivatives – functions with non-zero derivatives – zero derivatives and local extrema – Roll's theorem –The mean value theorem for derivatives. **Sec. 5.2 to 5.10**	12
Unit IV	**Monotonic Functions** Properties of monotonic functions – functions of bounded variation – total Variation – additive properties of total variation on (a. x) as a function of x – Functions of bounded variation expressed as the difference of increasing functions. **Sec. 6.2 to 6.5, 6.7**	12
Unit V	**Riemann Integral** The Riemann – Stieltjes integral : Introduction – Notation – The definition of Riemann – Stieltjes integral – change of variable in a Riemann – stieltjes integral –Reduction to a Riemann integral. **Sec.7.3, 7.6, 7.7**	12

Text Book:

1. Tom. M. Apostol – " Mathematical Analysis", 2nd ed.. Addison-Wisely. Narosa Publishing Company . Chennai, 1990.

Reference book:

1. Goldberg.R.R. – "Methods of Real Analysis", NY. John Wiley. New York 1976.

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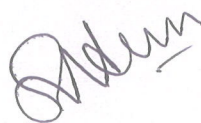Hindusthan College of Arts & Science,
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Code no	Subject	Semester No
16MAU23	COMPLEX ANALYSIS-II	VI
Objective:	To gain knowledge about the complex functions and its nature.	

Unit No	Topics	Hours
Unit I	**Results based on Cauchy's theorem(I)** Zeros-Cauchy's Inequality – Liouville's theorem – Fundamental theorem of algebra –Maximum modulus theorem –Gauss mean value theorem . **Chap VIII: Sec. 8.10, 8.11**	12
Unit II	**Taylor's series** Results based on Cauchy's theorem (II) –Taylor's series –Laurent's series . **Chap IX : Sec. 9.1 to 9.3, 9.13**	12
Unit III	**Singularities and Residues** Isolated singularities (Removable Singularity, pole and essential singularity) –Residues –Residue theorem **Chap IX: Sec. 9.5 to 9.12, 9.13, Chap X. Sec. 10.1 to 10.2, 10.4**	12
Unit IV	**Real definite integrals** Evaluation using the calculus of residues – Integration on the unit circle –Integral with - ∞ and + ∞ as lower and upper limits with the following integrals: i) P(x) /Q(x) where the degree of Q(x) exceeds that of P(x) at least 2. ii) (sin ax).f(x), (cos ax).f(x), where a>0 and f(z)$\rightarrow$0 as z$\rightarrow\infty$ and f(z) does not have a pole on the real axis. iii) f(x) where f(z) has a finite number of poles on the real axis. **Chap X: Sec. 10.3 to 10.4**	12
Unit V	**Meromorphic functions** Theorem on number of zeros minus number of poles –Principle of argument: Rouche's theorem – Theorem that a function which is meromorphic in the extended plane is a rational function. **Chap XI :Sec. 11.1 to 11.3 (Omit 11.5 and 11.6 theorems)**	12

Text Book:

1. Duraipandian.P and Laxmi Duraipandian – "Complex analysis", Emerald Publishers,Chennai –2, 1997.

Reference Book:

1. Churchill and Others – "Complex Variable and Applications", Tata Mc Graw Hill Publishing Company Ltd, 1974.

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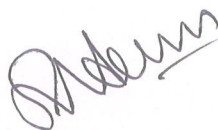| Code no	Subject	Semester No
16MAU24	MODERN ALGEBRA-II	VI
Objective:	To gain the knowledge about the elementary operations on matrices, characteristic vector of a square matrix, vector spaces and linear transformations.	

Unit No	Topics	Hours
Unit I	**Matrices** Introduction – Addition and Scalar Multiplication of Matrices – Product of Matrices –Transpose of a Matrix – Matrix Inverse – Symmetric and Skew - Symmetric Matrices. **Chap I Sec.1.1 to 1,3, 1.5 to 1.7**	12
Unit II	**Rank of a Matrix** Hermitian and Skew- Hermitian Matrices – Orthogonal and Unitary Matrices – Rank of a Matrix –Characteristic Roots and Characteristic Vectors of a Square Matrix. **Chap I, Sec. 1.8 to 1.9, Chap II, Sec.2.9, Chap III. 3.9**	12
Unit III	**Vector space** Elementary Basic Concepts – Subspace of a Vector space – Homomorphism – Isomorphism - Linear span – Linear Independence and Bases. **Chap IV Sec.4.1 to 4.2,**	12
Unit IV	**Dual Spaces** Inner Product Spaces – Norm of a Vector – Orthogonal Vectors – Orthogonal Complement of a subspace – Ortho normal set. **Chap IV, Sec. 4.3 to 4.4**	12
Unit V	**Linear Transformations** Algebra of Linear Transformations – Regular. Singular Transformations – Range of T – Rank of T – Characteristic Roots – Characteristic Vectors . **Chap VI, Sec.6.1 to 6.2 and6.3**	12

Text Book:

1. Balakrishnan.R and Ramabadran.M – "Modern Algebra", Vikas Publishing House Pvt. Ltd,
   New Delhi, (Second Revised Edition 1994) (For Units I & II)

Reference Book:

1. Surjeet Singh and Qazi Zameeruddin – "Modern Algebra", Vikas Publishing house, 1992.

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Code no	Subject	Semester No
16MAU25	OPERATIONS RESEARCH –II	VI
Objective:	To enhance knowledge in game theory, performance measures of queues, optimal use of Inventory and Network scheduling with application.	
Unit No	**Topics**	**Hours**
Unit I	**Game Theory** Introduction – Two – Person Zero-sum games – The Maximin – Minimax principle – Games without Saddle points –Mixedstrategies – Solution of 2 x 2 rectangular games – Graphical method- Dominance property. Sec. 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7	12
Unit II	**Queueing Theory** Introduction – Queueing system – Characteristics of Queueing system – Symbols and Notations – Poisson Process and Exponential Distribution – Classification of Queues – Definition ofTransient and Steady States – Poisson Queues – Simple Problems. Sec. 17.1, 17.2, 17.3, 17.4, 17.5, 17.6, 17.7, 17.8	12
Unit III	**Inventory Analysis** Introduction – Reasons for Carrying Inventory- Types of Inventory – The Inventory Decisions – Economic Order Quantity – Deterministic Inventory Problem – EOQ Problem with Price – Breaks. Sec. 18.1, 18.2, 18.3, 18.4, 18.5, 18.6, 18.7	12
Unit IV	**Replacement Problem** Introduction – Replacement of Equipment or Asset the Deteriorates – Replacement of Equipment that Fails Suddenly. Sec. 19.1, 19.2, 19.3	12
Unit V	**Network Scheduling By PERT/CPM** Introduction – Network Based Components – Rules of Network Connection – Time Calculations in Networks – Critical Path Method(CPM) – PERT – PERT Calculations. Sec.21.1, 21.2, 21.3, 21.4, 21.5, 21.6, 21.7	12

Text Book:

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

Reference Book:

1. Kantiswarup, Gupta. P. K., Man Mohan – "Operations research", S.Chand & Sons Education Publications, New Delhi, 12th Revised edition.

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Professor & Head,
PG & Research Dept. of Mathematics,
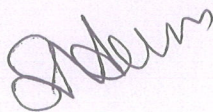Hindusthan College of Arts & Science,
Coimbatore - 641 028

Code no	Subject	Semester No
16MAU26	**FUZZY SETS AND FUZZY LOGIC**	VI
Objective:	To know of the fundamentals fuzzy Algebra ,fuzzy theory, fuzzy technology.	

Unit No	Topics	Hours
Unit I	**Introduction to fuzzy sets** Introduction – Fuzzy subsets – Lattices and Boolean Algebras – L-fuzzy sets – operations on fuzzy – level sets – properties of fuzzy subsets of a set **Part 2: Sections 6.1-6.2**	12
Unit II	**Operation on fuzzy sets** Algebraic product and sum of two fuzzy subsets-propertiessatisfied by Addition and product – Cartesian product of fuzzy subsets. **Part 2: Sections 6.3-6.4**	12
Unit III	**Relations on fuzzy sets** Introduction – Algebra of fuzzy relations – logic – connectives. **Part 2: Sections 6.5,7.1-7.3**	12
Unit IV	**Fuzzy relations:** Crisp and fuzzy relations – Binary fuzzy relations – Binary relations on a single set – Fuzzy equivalence relations–Fuzzy compatibility relations – Fuzzy ordering relations–Fuzzy morphism – Sup-i compositions of binary fuzzy relations – Inf- ωi compositions of fuzzy relations. **Chapter 5: Sections 5.1 – 5.10**	12
Unit V	**Applications:** Natural. life and Social Sciences – Engineering – Medicine – Management and decision making **Chapter 6: Sections 6.2 - 6.5**	12

Text Books:

1. *Rajasekaran.S, Vijayalakshmi Pai.G.A. – "Neural Networks, Fuzzy Logic and Genetic Algorithms – Synthethesis and Applications ", Prentice Hall of India Pvt. Ltd., New Delhi,2003 for Unit I to Unit III*
2. *George J.Klir and Bo Yuan – "Fuzzy Sets and Fuzzy Logic", Prentice Hall of India, For Unit IV*
3. *George J. Klir and Tina A. Folger – "Fuzzy Sets, Uncertainty and Information", Prentice-Hall of IndiaPrivate Limited-Fourth printing-June 1995 For Unit V*

Reference Book:

1.Timothy J. Ross – "Fuzzy Logic with Engineering Applications" , McGrow Hill , 1997.

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Code no	Subject	Semester No
16MAU27	**ELECTIVE II : a) NUMERICAL METHODS-II**	VI
Objective:	To gain the knowledge about solving the linear equations numerically and finding interpolation by using difference formulae.	

Unit No	Topics	Hours
Unit I	**Numerical differentiations** Newton's forward and backward formulae to compute the derivatives – Derivative using Stirlings formulae – to find maxima and minima of the function given the tabular values. **Chapter 9: Section 9.1 – 9.6**	12
Unit II	**Numerical Integration** Newton – Cote's formula – Trapezoidal rule – Simpson's 1/3rd and 3/8th rules, Weddle's rule. **Chapter 9: Section 9.7 – 9.9,9.13 – 9.15**	12
Unit III	**Difference Equation** Order and degree of a difference equation – Linear difference equation – solving homogeneous and non-homogeneous linear difference equations. **Chapter 10: Section 10.1 – 10.7**	12
Unit IV	**Numerical solution of O.D.E** Point wise method – Taylor series method – Euler's method – improved and modified Euler method – Runge Kutta method(fourth order Runge Kutta method only) **Chapter 11: Section 11.4,11.5,11.9 – 11.13**	12
Unit V	**Numerical solution of O.D.E(for first order only)** Milne's predictor corrector formulae – Adam-Bashforth predictor corrector formulae – solution of ordinary differential equations by finite difference method (for second order O.D.E). **Chapter 11: Section 11.16 – 11.18**	12

Text Book:

Kandasamy. P, Thilagavathi. K and Gunavathi. K – "Numerical methods", S. Chand and Company Ltd, New Delhi – Revised Edition 2007. (Chapters: 9,10,11, Appendix and Appendix E).

Reference Book:

1. Venkataraman M. K., –"Numerical Methods in Science and Engineering", National Publishing company V Edition 1999.

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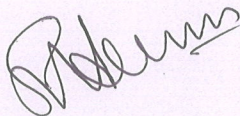Hindusthan College of Arts & Science,
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Code no	Subject		Semester No
16MAU27	ELECTIVE II : b) ASTRONOMY - II		VI
Objective:	To impart knowledge about the interesting facts of Moon, Sun, Planetary motion.		
Unit No	Topics		Hours
Unit I	**Time** Equation of time – Conversion of time – Seasons – Calendar		12
Unit II	**Annual Parallax** Annual Parallax – Aberration		12
Unit III	**Comparative study of Planets** Precession – Mutation		12
Unit IV	**Moon Phases** The Moon – Eclipses		12
Unit V	**Astronomical phenomena** Planetary Phenomenon – The Stellar system.		12

TextBook:

1. Mr.Kumaravelu and Susheela Kumaravelu – "Astronomy".

Reference Book:
1. John Duncan – "Astronomy", Paragon Publishers.

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