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

BSc. MATHEMATICS WITH COMPUTER APPLICATIONS
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							
16MCU01	Classical Algebra	5	3	25	75	100	4
16MCU02	Calculus	4	3	25	75	100	4
16MCU03	MS Office	4	3	25	75	100	2
16MCU04	**Allied :** Mathematical Statistics-I (**Mat**)	5	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							
16MCU05	Analytical Geometry	4	3	25	75	100	4
16MCU06	Trigonometry,Vector calculus and Fourier transforms	5	3	25	75	100	4
16MCU07	**Allied :** Mathematical Statistics-II (**Mat**)	5	3	25	75	100	4
16MCU08	Practical I : MS-Office	2	3	40	60	100	2
Part IV							
16GSU01	Value Education- Human Rights	2	-	100	-	100	2
Third Semester							
16MCU09	Statics	5	3	25	75	100	4
16MCU10	Differential Equations and Laplace Transforms	5	3	25	75	100	4

16MCU11	Numerical Methods -I	4	3	25	75	100	4
16MCU12	Programming in C	4	3	25	75	100	4
16MCU13	Practical II : Programming in C	2	3	40	60	100	2
16MCU14	**Allied : Accountancy (Com)**	5	3	25	75	100	5
Part IV							
16GSU02	Environmental Studies	2		100		100	2
Fourth Semester							
16MCU15	Dynamics	6	3	25	75	100	4
16MCU16	Discrete Mathematics	5	3	25	75	100	4
16MCU17	Numerical Methods -II	5	3	25	75	100	4
16MCU18	Visual Basic	4	3	25	75	100	4
16MCU19	Practical III : Visual Basic	2	3	40	60	100	2
Part IV							
16GSU03	Skill Based : Internet Security	2	-	100	-	100	2
Part V							
16GSU04	Extension Activity	-	-	100	-	100	2
Fifth Semester							
Part III							
16MCU20	Real Analysis- I	6	3	25	75	100	5
16MCU21	Complex Analysis-I	6	3	25	75	100	5
16MCU22	Modern Algebra-I	6	3	25	75	100	4
16MCU23	RDBMS & ORACLE	4	3	25	75	100	3
16MCU24	Practical IV : RDBMS & ORACLE	2	2	40	60	100	2
16MCU25	**Elective I :** a)Operations Research-I (OR) b)Graph Theory	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							
16MCU26	Real Analysis- II	6	3	25	75	100	5
16MCU27	Complex Analysis-II	6	3	25	75	100	5
16MCU28	Modern Algebra-II	6	3	25	75	100	4
16MCU29	Internet &Java	4	3	25	75	100	4
16MCU30	Practical V : Internet &Java	2	2	40	60	100	2
16MCU31	**Elective -II :** a) Operations Research-II (OR) b)Fuzzy logic	6	3	25	75	100	4

140

Code No	Subject	Semester No
16MCU01	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**	12
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**	12
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**	12
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**	12
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**	12

Text Book:

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

Reference Book:

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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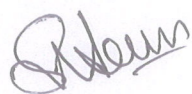Coimbatore - 641 028

Code No	Subject	Semester No
16MCU02	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**	10
Unit II	**Integration** Integration of irrational functions – Properties of definite integrals – Integration by parts – Reduction formulae. **Chapter 1 :8,11,12,13**	10
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**	10
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**	9
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**	9

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

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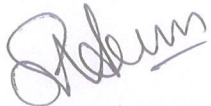Hindusthan College of Arts & Science,
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Code No	Subject	Semester No
16MCU03	MS OFFICE	I
Objective:	To gain knowledge about the basics in Microsoft word, Excel, Powerpoint, Access	

Unit No	Topics	Hours
Unit I	**Microsoft Word** Introduction – using tool bars, menus, Dialog box – controlling drives – folders – files – Recycle bin **Chapter 1**	10
Unit II	**Creating report and news letter** Creating new document – editing – working – adding headers – footers – and page numbering – printing documents – mail merge. **Chapter 2**	10
Unit III	**Microsoft Excel** Creating new workbook – entering data – editing worksheet – adding cell borders and shading – printing the worksheet – copying formulas – creating charts. **Chapter 3**	10
Unit IV	**Microsoft Access** Creating new database, table – editing and entering table – modifying a form – sorting – filtering and indexing data – creating a simple query report – Customizing report. **Chapter 4**	9
Unit V	**Microsoft PowerPoint** Introduction – creating – working with slides – inserting – deleting – copying – rearranging slides – adding – moving – adding graphics to slide. **Chapter 5**	9

Text book:

1. Karthikeyan.T, – "PC software for Office Automation",Jeyam Printographs July 2002.

Reference book:

1. Woody Leon hard, practice – " MS-office 2000"Hall of India private Limited 2000, New Delhi-110001.

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Code No	Subject	Semester No
16MCU04	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**	12
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**	12
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**	12
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**	12
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**	12

Text Book:

1. Gupta .S.C. & Kapoor. 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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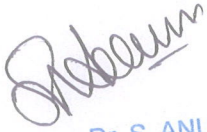Hindusthan College of Arts & Science,
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Code No	Subject	Semester No
16MCU05	**ANALYTICAL GEOMETRY**	II
Objective:	On successful completion of the course students should have gained knowledge about the regular geometrical figures and their properties.	

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**	10
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**	10
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**	10
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**	9
Unit V	**Conicoids** Notation – Enveloping cone tangent plane – simple problems. **Chapter 6 : 6.9 – 6.12**	9

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).

Reference Book:

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

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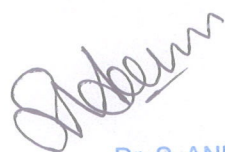Hindusthan College of Arts & Science,
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Code No	Subject	Semester No
16MCU06	TRIGONOMETRY,VECTOR CALCULUS AND FOURIER TRANSFORMS	II
Objective:	To gain knowledge about expansion of trigonometric functions, line integral, surface integral, volume integral 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**	12
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**	12
Unit III	**Scalar and vector fields** Differentiation of vectors – Gradient, Divergence and Curl – Simple Problems. **Chapter 1 and 2**	12
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**	12
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**	12

Text Books :

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

2. Duraipandian.P. Laxmiduraipandian – "Vector Analysis" (Revised Edition – Reprint 2005) Emerald Publishers. (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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Code No	Subject	Semester No
16MCU07	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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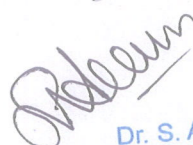Hindusthan College of Arts & Science,
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Code No	Subject	Semester No
16MCU08	**PRACTICAL I: MS OFFICE**	**II**
Objective:	To gain knowledge about the basics in Microsoft word, Excel, Powerpoint, Access	

MS-Word

1. Illustrate the mail merge concept to apply for a suitable job for at least 5 companies.
2. Using MS-word perform the following:
   Change the font size to 20
   Change the font type to Garamo nd
   Align the text to left, right, justify and center.
   Underline the text.
   Table manipulation.

MS-EXCEL

1. Built a worksheet to perform correlation and regression coefficient using formula and check the answer with built-in-functions.
2. Worksheet preparation for electricity bill preparation.
3. Draw graphs to illustrate class performance.

MS-Power Point

1. Prepare an organization chart for a college environment in PowerPoint.
2. Perform frame movement by inserting clipart to illustrate running of a car automatically.
3. Prepare a Power Point presentation with all the slide translation facilities.

MS-Access

1. Perform sorting on name, place and pin code of students database and list them in the sorted order.
2. Using queries retrieve information from sales database which contains Trans-no, date, prod-id, prod name qty, unit-price and region. List out records region wise,date-wise, product-wise.
3. Create mailing labels for employee database.

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Code No	Subject	Semester No
16MCU09	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**	12
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**	12
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**	12
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**	12
Unit V	**Stability of Equilibrium and Hanging strings** Equilibrium of a uniform homogeneous string, sag, suspension bridge. examples **Chapter 10 and 11**	12

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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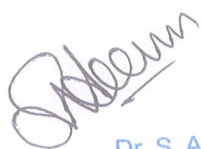Hindusthan College of Arts & Science,
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Code No	Subject	Semester No
16MCU10	DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	III
Objective:	To gain knowledge about differential equations and laplace transforms	
Unit No	Topics	Hours
Unit I	**Differential 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	12
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	12
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	12
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.	12
Unit V	**Laplace Transforms** Laplace transforms – Definition – Transform of f(t), – e^{pat}, Cos at, Sin at and t^n when n is an integer . Chapter 5: 1,2,4	12

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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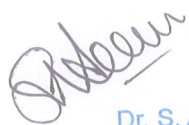Coimbatore - 641 028

Code No	Subject	Semester No
16MCU11	**NUMERICAL METHODS I**	III
Objective:	To gain knowledge about solving algebraic linear equations	
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.**	9
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.**	10
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.**	10
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.**	10
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.**	9

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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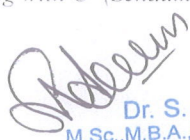Hindusthan College of Arts & Science,
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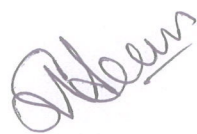| Code No	Subject	Semester No
16MCU12	PROGRAMMING IN C	III
Objective:	To gain knowledge about the C programming language	
Unit No	Topics	Hours
Unit I	**Introduction** Importance of C Basic structure of C programme - Character set - Constants – Keywords and identifiers – Variables Data types – Declaration of variables –Assigning values to variables –Defining symbolic constants. **Chapter 1: 1.2,1.8, Chapter 2:2.1 – 2.11**	9
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. **Chapter 3:3.1 – 3.15, Chapter 4: 4.2 – 4.5**	10
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, Chapter 6:6.2 – 6.5**	10
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**	10
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**	9

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 McGrawHill publishing company - 1998.

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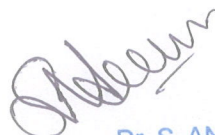Hindusthan College of Arts & Science,
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Code No	Subject	Semester No
16MCU13	**PRACTICAL II: PROGRAMMING IN C**	**III**
Objective:	To gain knowledge about the C programming language	

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
16MCU15	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.**	14
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**	14
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**	14
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**	15
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**	15

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
16MCU16	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	**Mathematical 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**	12
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**	12
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, Monoids, 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**	12
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**	12
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**	12

Text Book:

1. Tremblay. J.P. and Manohar. R.P. – "Discrete Mathematical Structures with applications to computer science", Mc.Graw Hill, 2001.(unit I to V)

Reference Book:

1. Sharma. J.K. – "Discrete maths".

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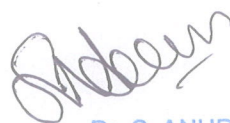Coimbatore - 641 028

Code no	Subject	Semester No
16MCU17	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:

1. 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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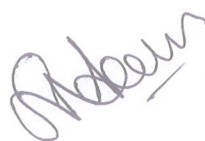Hindusthan College of Arts & Science,
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Code No	Subject	Semester No
16MCU18	**VISUAL BASIC**	IV
Objective:	To gain knowledge about visual basic	
Unit No	**Topics**	**Hours**
Unit I	**Introduction to VB** Event and event procedure-Object related concepts-VB program development process- components- VB environment- Saving and running a VB project- VB Fundamentals- Constants- Variables-Operators-Library functions. **Chapter 1: Section 1.1 – 1.4,1.7 – 1.11,Chapter 2:Section 2.1 – 2.12**	10
Unit II	**Branching and Looping** Logical operators-if-then- if-then-else- select case- For next- Do loop-While-wend- stop- VB Control functions- Forms and Controls. **Chapter 3: Section 3.1 – 3.9, Chapter 4: Section 4.1 – 4.15**	10
Unit III	**Menus and Dialog boxes** Drop-down menus – submenus-popup menus – Dialog boxes – Input box function – Syntactic errors – Logical errors – Error handlers. **Chapter 5: Section 5.1 – 5.8, Chapter 6: Section 6.1 – 6.2,6.7**	10
Unit IV	**Procedures** Modules and Procedures – Sub Procedures – Function Procedures – Scope – Optional Arguments. Arrays : Array Characteristics – Array Declarations – Processing Array Elements – Passing Arrays to Procedures- Dynamic Arrays- Array- Related Functions. **Chapter 7: Section 7.1 – 7.6, Chapter 8: Section 8.1 – 8.7**	9
Unit V	**Arrays and Data files** Control Arrays – Looping with For Each-Next – optional arguments. Data File Characteristics – Accessing and Saving a File in VB: The Common Dialog Control – Processing a Data File – Sequential Data Files – Random Access Data Files – Binary Files. **Chapter 9: Section 9.1 – 9.6**	9

Text book:

1.Byron S Goutfried ,"Visual Basic", Fourteenth Edition, The Tata McGraw – Hill Companies,2009.

Reference book:

1. Mohammed Azam "Programming with VB 6.0 ,", Vikas Publications,2001

Code No	Subject	Semester No
16MCU18	PRACTICAL III: VISUAL BASIC	IV
Objective:	To gain knowledge about visual basic	

1. a) In VB- create a project that displace the current date and time. Use VB variable Now and the format library function.

2. Write a program to enter and display text. Use textbox

3. Write a program to convert temperature from Fahrenheit to Centigrade

4. Write a program to select any one from a list U combo box to display choices

5. Write a program to calculate factorial of a given number

6. Write a program to illustrate the usage of Timer control

7. Write a program to illustrate the usage of Scroll bars

8. Write a program to illustrate the usage of Dropdown menus

9. Write a program to illustrate the usage of menu enhancement

10. Write a program to illustrate the usage of pop-up-menu

11. Write a program to illustrate the usage of input boxes

12. Write a program to find the smallest of n numbers

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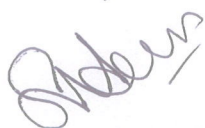Hindusthan College of Arts & Science,
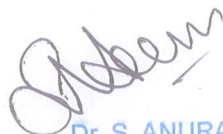Coimbatore - 641 028

Code no	Subject	Semester No
16MCU20	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	15
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	15
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	14
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	14

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

Code no	Subject	Semester No
16MCU21	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**	15
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**	15
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**	14
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 simply connected region). Cauchy's integral formula for higher derivatives (statement only) – Morera's theorem. **Chap VIII, Sec.8.1 to 8.9**	14

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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Code no	Subject	Semester No
16MCU22	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**	15
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**	15
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**	14
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**	14

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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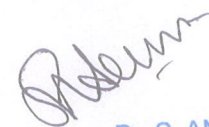PG & Research Dept. of Mathematics,
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Code no	Subject	Semester No
16MCU23	RDBMS&ORACLE	V
Objective:	To enable the students to learn about the basic concepts of DBMS, RDBMS, QL,PL/SQL, forms and Reports .	

Unit No	Topics	Hours
Unit I	**Basic concepts of DBMS** Entities and their attribute Keys Prime Keys, secondary keys, Super Keys, Candidate Keys, Alternative Keys - Examples, Relationship – Records and files, Data independence, Views – Types of Views, Components of a DBMS, DDL, DML,DQL. Advantages and disadvantages of RDBMS. **Chapter 1: Section 4.2, 6.5.1 and 6.5.2**	10
Unit II	**Integrative SQL** Invoking SQL plus, data manipulation in DBMS , The ORACLE data types, two dimension matrix creation. Intersection of data into tables, data constraints, computation in expression lists used to select data, logical operation. Range searching, pattern matching, Oracle function. **Chapter 2.**	10
Unit III	**PL/SQL-Introduction** The PL/SQL execution environment, the PL/ SQL syntax, Understanding the PL/SQL Block structure, database triggers. **Chapter 3.**	10
Unit IV	**Working with forms** Basic concepts, Application development in forms, Form module, Blocks items, Canvas view windows, Creating a form Generating and running a form, Using the Layout editor, Master form, Creating a master detail form. **Chapter 7, 8,11**	9
Unit V	**Working with reports** Defining a data model for report , specific the layout of a report, use the Oracle reports interface. Creating a default tabular report. **Chapter 16**	9

Text book:
1.Ivan bayross For units 2, 3, 4, 5, treatment as in "Commercial application Development using Oracle developer 2000".
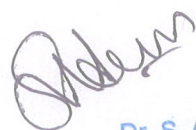
Reference Book:
1.BipinDesai "Introduction to Database System

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Code no	Subject	Semester No
16MCU24	PRACTICAL IV: RDBMS&ORACLE	V
Objective:	To enable the students to learn about the basic concepts of DBMS, RDBMS, QL,PL/SQL, forms and Reports .	

1. Creating tables and writing simple queries using Comparison operators

2. Creating tables and writing simple queries using   Logical Operators

3. Writing Queries using built in functions

4. Updating and altering tables using SQL

5. Creating tables and writing simple queries using Set operators.

6. Creating tables and writing simple queries using Sorting and Grouping.

7. Creation of students information table and write PL/SQL blocks find the total, average marks and results

8. Write a PL/SQL block to prepare the electricity bill

9. Write a PL/SQL to split the students information table in to two , one with the passed and other with failed

10. Write PL/SQL block to join two tables, first table contains the Roll no. and address, second table contains the Roll no and marks.

11. Creation of Reports using column format.

12. Create a database Trigger to check the data validity of record.

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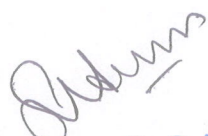Hindusthan College of Arts & Science,
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Code no	Subject	Semester No
16MCU25	**ELECTIVE I : a) OPERATIONS RESEARCH-I**	V
Objective:	To gain knowledge about optimal use of resources.	

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**	15
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**	15
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**	14
Unit V	**The Assignment problems** Introduction – Mathematical formulation of an A.P. – Assignment algorithm **Sec. 7.1, 7.2, 7.3**	14

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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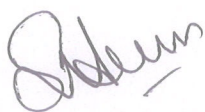Hindusthan College of Arts & Science,
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Code no	Subject	Semester No
16MCU25	ELECTIVE I : b) GRAPH THEORY	V
Objective:	On successful completion of this course the students should gain knowledge about Graph Theory	

Unit No	Topics	Hours
Unit I	**Graphs** Graphs –Sub graphs – Degree of a vertex walks, paths and cycles in a Graph – connected graph. **Chapter :1,4,5**	15
Unit II	**Euler Graphs** Euler and Hamiltonian Graphs –Trees – cut vertex and cut edge. **Chapter 9: Section 150 – 154, Chapter 10: Section 160 -166, Chapter 6:Section 79 - 86**	15
Unit III	**Matrix representation of a graph** Adjacency matrix – Incidence matrix – Matrix Tree theorem **Chapter 17:Section 338 – 344,360 - 363**	14
Unit IV	**Planar graphs** Plane and planar graphs – Kuratowski's theorem (statement only) **Chapter 12: Section 214 – 241,251 - 255**	14
Unit V	**Directed graphs** Digraphs and connectedness. Digraphs Tournaments, Matrices of digraphs **Chapter 16 : Section 301 – 318,332 – 337, 345 - 349**	14

Text Book:
1. Kumaravelu.S, Susheela Kumaravelu,. -"Graph Theory" (Janki calendar publications).

Reference Book:
1. Harary, -"Graph Theory" (Narosa Publishing HQCK).

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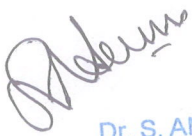Coimbatore - 641 028

Code no	Subject	Semester No
16MCU26	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	14
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	14
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	14
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	15
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	15

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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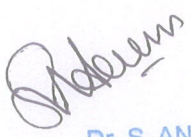Hindusthan College of Arts & Science,
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Code no	Subject	Semester No
16MCU27	COMPLEX ANALYSIS-II	VI
Objective:	To gain knowledge about the complex functions and its nature.	

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**	14
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**	14
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**	14
Unit IV	**Real definite integrals** Evaluation using the calculus of residues – Integration on the unit circle –Integral with $-\infty$ and $+\infty$ 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)→0 as z→∞ 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**	15
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)**	15

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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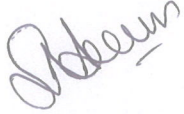Hindusthan College of Arts & Science,
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Code no	Subject	Semester No
16MCU28	**MODERN ALGEBRA-II**	VI
Objective:	To gain the knowledge about the elementary operations on matrices, characteristic vector of a square matrix, vector spaces and linear transformations.	

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**	14
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**	14
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,**	14
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**	15
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**	15

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
16MCU29	**INTERNET AND JAVA**	VI
Objective:	To enable the students to study about internet, mail, web, HTML, Usenet, Gopher, veronica, Jug head, Archie and Java fundamentals, class, packages, exception handling, threads, applets and AWTS.	
Unit No	**Topics**	**Hours**
Unit I	**Introduction to Internet** Resources of Internet -hardware and software requirements of internet- Internet service providers (ISP)-Internet addressing- Mail Using mail from a shell account - Introduction to web- using the web. **Chapter 3,4,5**	9
Unit II	**URLs, schemes host names and port numbers** Using the browser Hypertext and HTML- Using the web from a shell account Introduction to Usenet -Reading and posting Usenet articles- Using Usenet from a shell account- Gopher, Veronica and Jug head- Using gopher from a shell account. **Chapter 6,8,12**	10
Unit III	**Anonymous ftp** Using ftp from a shell account-archie-file type uses on the internet downloading software - mailing lists- telnet- using telnet from a seller account talk facilities- using talks from a shell account – talk felicities – using talks from a shell account – IRC and MUDS **Chapter 9,13,14,15,16,18**	10
Unit IV	**Features of Java** Java environment - comparing java with C++ - introduction to java language -types - operators - flow control - classes - packages and interfaces. **Chapter 2:2.1 -2.4, Chapter 3:3.1 – 3.2,3.5 – 3.7, Chapter 4: 4.1 – 4.5, Chapter 5:5.1 – 5.8**	10
Unit V	**Java classes** Exception handling - threads and synchronization - input / output - networking - applets -abstract windows toolkit (AWT)-imaging. **Chapter 6,12,15**	9

Text book:
1. Harley Hahn, -"The internet "- Complete reference, second edition, Tata McGraw Hill, 1996. (unit I,II,III)
2. Balagurusamy.E, -"Programming in Java" Tata McGraw Hill, 2010. (unit IV and V)
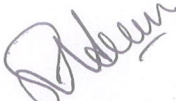
Reference Book:
1. Patric Naughton,- "Java Hand Book", Tata McGraw Hill, 1996

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Code no	Subject	Semester No
16MCU30	**PRACTICAL V: INTERNET AND JAVA**	VI
Objective:	To enable the students to study about internet, mail, web, HTML, Usenet, Gopher, veronica, Jug head, Archie and Java fundamentals, class, packages, exception handling, threads, applets and AWTS.	

1. Write a Java program to print the triangle of numbers.

2. Write a program which creates and displays a message on the windows.

3. Write a program to draw several shapes in the created window.

4. Write a Java program to accept values and find the given no. is even or odd.

5. Create web pages using HTML to display ordered and unordered list of a departmental store.

6. Write a program to display image and text using HTML tag for a advertisement of a company   product
.

7. Create web pages for a business organization using HTML frames.

8. Create a web site of your department with minimum links using HTML .

9. Create a document using formatting and alignment tags in HTML.

10. Write a Java program to calculate Standard deviation.

11. Write a Java program to illustrate the use of command line arguments.

12. Write a Java program to sort a list of numbers.

Code no	Subject	Semester No
16MCU31	ELECTIVE II : a) 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 –Mixed strategies – 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	14
Unit II	**Queueing Theory** Introduction – Queueing system – Characteristics of Queueing system – Symbols and Notations – Poisson Process and Exponential Distribution – Classification of Queues – Definition of Transient and Steady States – Poisson Queues – Simple Problems Sec. 17.1, 17.2, 17.3, 17.4, 17.5, 17.6, 17.7, 17.8	14
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	14
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	15
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	15

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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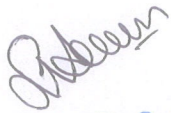| Code no	Subject	Semester No
16MCU31	ELECTIVE II : b) FUZZY LOGIC	VI
Objective:	To know of the fundamentals fuzzy Algebra ,fuzzy theory, fuzzy technology.	

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**	14
Unit II	**Operation on fuzzy sets** Algebraic product and sum of two fuzzy subsets-properties satisfied by Addition and product-Cartesian product of fuzzy subsets. **Part 2: Sections 6.3-6.4**	14
Unit III	**Relations on fuzzy sets** Introduction - Algebra of fuzzy relations - logic-connectives. **Part 2: Sections 6.5,7.1-7.3**	14
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**	15
Unit V	**Applications:** Natural, life and Social Sciences - Engineering - Medicine - Management and decision making **Chapter 6: Sections 6.2 - 6.5**	15

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 India Private 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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