B.SC MATHEMATICS WITH COMPUTER APPLICATIONS

PROGRAM OUTCOME

PO1: Students will be able to communicate in written and oral forms in such a way as to demonstrate their ability to present information clearly, logically, and critically.

PO2: Realize ethical and moral values in personal and social life.

PO3: Understand the issues of environmental contexts and sustainable development.

PO4: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

PROGRAMME SPECIFIC OUTCOME

PSO1: Enable the students to acquire the knowledge in algebra, analytical geometry, differential and Integral calculus and differential equations.

PSO2: Enable the students to enhance their knowledge in Transform Techniques, Statics, Differential equations, Integral Calculus and Mathematical statistics.

PSO3: Facilitate the students to have a thorough knowledge on Dynamics, Algebraic structures, Real and Complex Analysis, and Discrete mathematics.

PSO4: Help the students to have a fair knowledge in fundamentals of Retail Marketing, Basics of Business Insurance and soft skills.

PSO5: Analyse Fermat's, Wilson's, Gauss, Green's, stoke's, Liouvillie's theorem and fundamental theorem of algebra and apply the theorems to solve problems.

PSO6: Analyse the test of significance for mean, proportion, variance based on normal, t, F,chi-square statistics and apply the concepts to solve problems.

PSO7: Understand the fundamentals of Programming Languages, Data structure and Operating system.

PSO8: Develop Database connection oriented Applications.

Subject Name: Algebra And Trigonometry –I **Year: I**
Subject Code: TAB1A **Semester: I**

ALGEBRA: Theory of equations : Polynomial equations; imaginary and irrational roots; Relation between roots and coefficient; Symmetric functions of roots in terms of coefficients; Sum of r th powers of roots ; Transformations of equations; Reciprocal equations.

Descartes' rule of signs: Approximate solutions of roots of polynomials by Newton - Rapsons , Horner's method; Cardan's method of solution of a cubic polynomial.

Summation of Series using Binomial, Exponential and Logarithmic series (theorems without proof)
Summation of finite Series using method of differences-simple problems.

TRIGONOMETRY: Expansions of powers of sinθ, cosθ, tanθ in terms of θ, sinnθ, cosnθ, tannθ $cos^n\theta$, sin^n θ,tan^nθ, Hyperbolic and inverse hyperbolic functions-simple problems.

Reference books:

1. Algebra: T.K.Manickavachagam Pillai and others (S.Viswanathan publications)
2. Higher Algebra :H.S.Hall and S.R.Knight(HM publications -1994)
3. Pure Mathematics :Hardy
4. Trigonometry :P.Duraipandian
5. Plane Trigonometry part2 ;S.L.Loney, (Macmillan and Co.London)
6. Algebra,Analytical Geometry (2D) and Trigonometry:Dr.S.Sudha (Emerald Publishers).

COURSE OUTCOME

CO1: Evaluate the roots of polynomial equations and solving Problems on transformation of equations and reciprocal equations.
CO2: Solve the problems based on exponential and logarithmic series and finding the approximate solutions of roots of polynomials.
CO3: Determine the approximate solution of roots by Horner's and Newton – Rapson's method
CO4: Expand sinθ, cosθ, tanθ, sinnθ, cosnθ, tannθ $cos^n\theta$, sin^nθ,tan^nθ in terms of θ and solve problems based on it.
CO5: Solve problems based on hyperbolic functions and inverse hyperbolic functions.

Subject Name: **Calculus And Coordinate Geometry Of 2 Dimensions** **Year: I**
Subject Code: TAB1B **Semester: I**

DIFFERENTIAL CALCULUS : nth derivative; Leibnitz's theorem (without proof) and its applications; Partial differentiations. Total differentials; Jacobians; Maxima and Minima of functions of 2 and 3 independent variables Necessary and sufficient conditions (without proof); Lagrange's method (without proof) —Simple problems on these concepts.

COORDINATE GEOMETRY : Conics — Parabola, ellipse, hyperbola and rectangular hyperbola — pole, co-normal points, con- cyclic points, conjugate diameters, asymptotes and conjugate hyperbola.

Reference books :

1. Analytical geometry : T.K.Manickavachagam Pillai and others (S.Viswanathan publications)
2. Analytical geometry of 2 dimensions :P.Duraipandian
3. Coordinate geomrty :Dr. Balasubramanian and others (McGraw HillPublishers)
4. Calculus :S.Narayanan and oters (S.Viswanathan publications)
5. Calculus; Dr.S.Sudha (Emerald Publishers)

COURSE OUTCOME

CO1: Compute n^{th} order partial derivatives and total derivatives.
CO2: Apply Leibnitz theorem to find n^{th} order derivatives
CO3: Determine Maxima and minima of functions of two and three independent variables.
CO4: Examine the Conic-Parabola,ellipse,hyperbola and rectangular hyperbola.
CO5: Determine pole, co-normal points, con-cyclic points, conjugate diameters, Asymptotes to a conic.

Subject Name: Object Oriented Programming In C ++ **Year: I**
Subject Code: TAB1C **Semester: I**

UNIT-1: Procedure oriented programming (POP) – Examples -Object oriented programming (OOP) – Examples – OOPs concepts –Comparison of POP and OOP – Applications OOPs.

UNIT-2: Introduction to C++; Tokens, Keywords, Identifiers, Variables, Operators, Manipulators, Expressions and Control Structures in C++; Pointers - Functions in C++ - Main Function -Function Prototyping - Parameters Passing in Functions- Values Return by Functions - Inline Functions – Friend Functions.

UNIT-3: Classes and Objects; Constructors and Destructors; Type of Constructors; Type Conversions - Function overloading – Operator overloading.

UNIT-4: Inheritance: Single Inheritance- Multilevel Inheritance -Multiple Inheritance - Hierarchical Inheritance - Hybrid Inheritance. Virtual Functions and Polymorphism; Managing Console I/O operations.

UNIT-5: Working with Files: Classes for File Stream Operations -Opening and Closing a File - End-of-File Deduction - File Pointers -Updating a File - Error Handling during File Operations -Command-line Arguments.

Recommended Texts:

1. E. Balagurusamy,1995,Object Oriented Programming with C++, Tata McGraw-Hill Publishing Company Ltd.
2. Robert Lafore, Object Oriented Programming in Microsoft C++, Galgotia publication.
3. H.Schildt, C++,1998,The Complete Reference-1998-TMH Edition, 1998

COURSE OUTCOME

CO1: Understand Object Oriented Programming.
CO2: Define tokens: keywords, identifiers, variables etc.
CO3: Compare constructors & destructors.
CO4: Differentiate the types of inheritance.
CO5: Classify the various file stream operations.

Subject Name: C++ Programming Lab **Year : I**
Subject Code: TAB11 **Semester: I**

1. Simple interest calculation.
2. Determining the Perimeter and Area of a Triangle.
3. Solving Quadratic equation.
4. Program to calculate the average of 'n' numbers
5. Program to demonstrate Function overloading
6. Program to demonstrate Operator overloading
7. Program to demonstrate inheritance (Single, Multiple).
8. Virtual functions.
9. Program to copy the content of one file to another.

COURSE OUTCOME

CO1: Calculate simple and compound interest.
CO2: Compute the quadratic equation.
CO3: Perform function overloading and operator overloading.
CO4: Compare single inheritance and multiple inheritances.
CO5: Perform to copy the content of one file to another.

Subject Name: Basics Of Retail Marketing **Year : I**
Subject Code: CNE1B **Semester: I**

UNIT-1: Retailing- definition- Retail Marketing-Growth of organized retailing in India- importance of retailing.

UNIT-2: Functions of Retailing-characteristics of Retailing-types of retailing-store retailing-non-store Retailing.

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UNIT-3: Retail location factors- Branding in retailing-private labeling-Franchising concept.

UNIT-4: Communication tools used in retailing- sales promotion, e- retailing-window display.

UNIT-5: Supply chain management-definition-importance-Role of information technology in retailing.

Reference Books:

1. Modern Retail management – J.N.Jain and P.P.singh Regal publications New Delhi.
2. Retail Management- SujaNair, Himalaya Publishing House.

COURSE OUTCOME

CO1: Understand the retail marketing.
CO2: Analyse the Marketing means to business executives and academics.
CO3: understand the Retailers and marketing tools.
CO4: Describe the Techniques to interact with their customers.

Subject Name: Algebra And Trigonometry-II **Year : I**
Subject Code: TAB2A **Semester: II**

MATRICES: Symmetric; Skew Symmetric; Hermitian; Skew Hermitian; Orthogonal and Unitary Matrices; Rank of a matrix; Consistency and solutions of Linear Equations; Cayley Hamilton Theorem; Eigen values; Eigen Vectors; Similar matrices; Diagonalization of a matrix.

NUMBER THEORY: Prime number ; Composite number; decomposition of a composite number as a product of primes uniquely (without proof); divisors of a positive integer n; congruence modulo n; Euler function (without proof); highest power of a prime number p contained in n!; Fermat's and Wilson's theorems — simple problems.

LOGARITHMS OF COMPLEX NUMBERS.

SUMMATION OF SERIES: Sums of sines and cosines of n angles which are in A.P.; Summation of trigonometric series using telescopic method, C + i S method.

Reference books :

1. Algebra :T.K.Manickavachagam Pillai and others (S.Viswanathan publications)
2. Algebra :S.Arumugam (New Gama publishing house Palayamkotai)
3. Trigonometry :P.Duraipandian
4. Plane Trigonometry part2 ;S.L.Loney, (Macmillan and Co.London)

COURSE OUTCOME

CO1: Solve simultaneous linear equations using matrix operations.
CO2: Evaluate Eigen values and Eigen vectors and hence diagonalize the given matrix.
CO3: Apply Cayley-Hamilton theorem to solve the simultaneous linear equations.
CO4: Analyze number theory and decompose a composite number as a product of primes.
CO5: Apply Fermat's and Wilson's theorems to solve the congruences.
CO6: Sum the trigonometric series whose angles are in A.P, using telescopic method or C+iS method.

Subject Name: Calculus And Differential Geometry **Year : I**
Subject Code: TAB2B **Semester: II**

CURVATURE: Curvature; radius of curvature in Cartesian coordinates; polar coordinates; equation of a straight line, circle and conic; radios of curvature in polar coordinates; p-r equations; evolutes; envelops;

ASYMPTOTES : Methods (without proof) of finding asymptotes of rational algebraic curves with special cases.

INTEGRAL CALCULUS: Methods of integration; Properties of definite integrals; Reduction formulae — Simple problems. Double integrals; change of order of integration; triple integrals; applications to area, surface area and volume. Beta and Gamma functions, properties and simple problems.

Reference books :

1. Calculus :S.Narayanan and oters (S.Viswanathan publications) Integral Calculus and differential equations ; Dipak Chaterjee (TATA McGraw Hill Publishing co.ltd)

COURSE OUTCOME

CO1: Examine the Radius of curvature in Cartesian and polar coordinates.
CO2: Derive Equation of straight line, circle and conic and solve problems concerning them.
CO3: Determine the equations of Asymptotes of rational algebraic curves.
CO4: Examine the Properties of definite integrals.
CO5: Apply change of order of integrations to slove double and triple integrals and hence find the area and volume.
CO6: Adopt Beta and Gamma functions to solve integrals.

Subject Name: Data Structures **Year : I**
Subject Code: TAB2C **Semester: II**

UNIT-1: Data Structures: Definition of a Data structure – primitive and composite Data Types, Arrays, Operations on Arrays, Order lists

UNIT-2: Stacks – Operations on stack - Applications of Stack – Infix to Postfix Conversion – Evaluation of postfix expression; Recursion. Queues - Circular Queue - Operations on Queues, Queue Applications.

UNIT-3: Singly Linked List - Operations, Application - Representation of a Polynomial, Polynomial Addition; Doubly Linked List – Operations.

UNIT-4: Trees: Binary Trees – definitions – Binary search tree - Conversion of Forest to Binary Tree, Operations - Tree Traversals;

UNIT-5: Graph-Definition, Types of Graphs – memory representation – Graphtraversal. Hashing Tables and Hashing Functions – handling collusions.

Recommended Texts:

2. E.Horowitz and S.Shani,1999, Fundamentals of Data Structures in C++ , Galgotia Pub.

Reference Books:

1. R. Kruse C.L. Tondo and B. Leung ,1997, Data Structures and Program design in C, PHI.
2. Cangsam, Auguenstein, Tenenbaum, Data Structures using C & C++,PHI.
3. D.Samantha,2005, Classic Data Structures, PHI, New Delhi.

COURSE OUTCOME

CO1: Define operation on arrays.
CO2: Define stack and queue operations.
CO3: Compare single link list and doubly linked list.
CO4: Understand the Binary tree traversal methods.
CO5: Describe Graph and type of graph.

Subject Name: Data Structures Using C++ Lab **Year: I**
Subject Code: TAB21 **Semester: II**

1. Implement PUSH, POP operations of stack using
2. Implement PUSH, POP operations of stack using
3. Implement add, delete operations of a queue using Arrays.
4. Implement add, delete operations of a queue using Pointers.
5. Addition of two polynomials using Arrays and Pointers.
6. Binary tree traversals using recursion.
7. Depth First Search and Breadth first Search for Graphs using Recursion.

COURSE OUTCOME

CO1: Construct the stack operations using arrays & Pointers.
CO2:.Constructthe queue operations using arrays & Pointers
CO3: Manipulate the operations on polynomials using arrays and pointers.
CO4: Apply the traversal methods in-order, pre-order and post-order in Binary tree.
CO5: Compare the Depth First Search and Breadth First Search.

Subject Name: Basics Of Business Insurance **Year : I**
Subject Code: CNE2B **Semester: II**

UNIT-1: Introduction to Insurance-type of Insurances-principles of Insurance.

UNIT-II : Salient features of IRDA Act- Administration of IRDA Act-Regulatory measures of IRDA.

UNIT-II: Life Insurance products-Term, Whole life, Endowment.

UNIT-IV: Introduction to general Insurance-fire, marine and motor insurance.

UNIT-V: Government and Insurance companies-LIC India-private players in Insurance in India.

Book for Reference:

1. Dr.N.Premavathy— Elements of Insurance Sri Vishnu Publications, Chennai.
2. Dr.A.Muthy — Elements of Insurance, Margham Publications, Chennai.
3. M.N.Mishra — Insurance, Principles and practice, S.Chand & Co. Ltd., New Delhi

References :

1. Nalini Prava Tripathy, Prabir Paal — Insurance Theory & Practice. Prentice Hall of India
2. Anand Ganguly — Insurance Management, New Age International Publishers

COURSE OUTCOME

CO1: Understand the Commercial insurance and available products.
CO2: Analyse the Essential perspective of current market practices.
CO3: List out the Principles of risk management and insurance.
CO4: Describe the Methodology in the identification, analysis and management of risks.
CO5: Understand the Basic principles of insurance, as one possible risk financing tool.

Subject Name: Differential Equations And Laplace Transforms **Year : II**
Subject Code: TAB3A **Semester: III**

First order but of higher degree equations - solvable for p, solvable for x, solvable for y, clairaut's form - simple problems. Second order differential equations with constant coefficients with particular integrals for e^{ax},x^m , e^{ax}sinmx, e^{ax} cosmx.Second order differential equations with variable coefficients ax^2 $\frac{d^2y}{dy^2}$'+ bx $\frac{dy}{dx}$+ cy = q(x); Method of variation of parameters; Total differential equations, simple problems.

PARTIAL DIFFERENTIAL EQUATIONS: Formation of P.D.E by eliminating arbitrary constants and arbitrary functions; complete integral; Singular integral ; general integral; Charpit's method and standard types f(p,q)=O, f(x,p,q)=0, f(y,p,q)=O, f(z,p,q)=0, f(x,p)=f(y,q); Clairaut's form and Lagrange's equations Pp+Qq=R - simple problems.
Laplace transform; inverse Laplace transform(usual types); applications of Laplace transform to solution of first and second order linear differential equations (constant coefficients) and simultaneous linear differential equations - simple problems.

Reference books :

1. Engineering Mathematics volume 3 ; M.K.Venkatraman (National Publishing Co.)
2. Engineering Mathematics volume 3:P.K.andasamy (S.Chand and Co.)
3. Advanced Engineering Mathematics; Erwin Kreyszig (John Wiley and sons New York 1999)
4. Calculus :S.Narayanan and oters (S.Viswanathan publications)
5. Integral Calculus and differential equations ; Dipak Chaterjee (TATA McGraw Hill Publishing co.ltd)
6. Differential Equations and Integral Transforms : (Emerald Publishers)

COURSE OUTCOME

CO1: Determine differential equations by solving for p,x,y.
CO2: Solve the differential equation by using method of variation of parameters.
CO3: Find Partial differential equations by eliminating arbitrary constants and functions.
CO4: Frame differential equations using Charpit's method, Clairaut's form and Lagrange's equations.
CO5: Apply Laplace transforms and inverse Laplace transforms to solve first and second order simultaneous linear differential equations.

Subject Name: Coordinate Geometry Of 3D And Probability **Year : II**
Subject Code: TAB3B **Semester: III**

PLANES AND LINES: Planes and Lines - Reduction to symmetric form of a line given by a pair of planes; conditions for 2 lines to be coplanar and the equation of the plane containing the lines; length and equation of the shortest distance between 2 skew lines; image of a point and a line w.r. t. a plane, bisector planes.

SPHERE: Equation of a sphere; general equation; section of a sphere by a plane ;tangent plane ; radical plane ; coaxial system of spheres; orthogonal spheres.

PROBABILITY: Probability Space; total probability ; Multiplication law on probability;conditional probability, Independent events; Baye' s Theorem..
Random variables; discrete and continuous; distribution functions; expected value; moments; Moment generating function; probability generating function.

Reference books :

1. Differential Equations ,Fourier series and Analytical Solid Geometry :P.R.Vittal
2. Engineering Mathematics volume 3 ; M.K.Venkatraman (National Publishing Co.)
3. Engineering Mathematics volume 3:P.K.andasamy (S.Chand and Co.)
4. Advanced Engineering Mathematics; Stanley Grossman and william R.Devit (S.Chand and Co.)
5. Fundamentals of Mathematical Statistics :S.C.Gupta and V.K.Kapoor)
6. Mathematical Statistics and probability by P.R.Vittal 9Margam Publication)

COURSE OUTCOME

CO1: Discuss planes and lines and conditions for two lines to be coplanar.
CO2: Determine equation of the shortest distance between two skew lines.
CO3: Determine equation of the sphere in tangent plane and radical plane.
CO4: Discuss the Probability space and its properties.
CO5: Classify Discrete and Continuous random variables and its distribution functions with various measures.

Subject Name: Mathematical Statistics-I **Year : II**
Subjectcode: SBAOA **Semester: III**

UNIT-1: Statistics – Definition – functions – applications – complete enumeration – sampling methods – measures of central tendency – measures of dispersion – skew ness-kurtosis.

UNIT-2: Sample space – Events, Definition of probability (Classical, Statistical & Axiomatic) – Addition and multiplication laws of probability – Independence – Conditional probability – Bayes theorem – simple problems.

UNIT-3: Random Variables (Discrete and continuous), Distribution function – Expected values & moments – Moment generating function – probability generating function – Examples. Characteristic function – Uniqueness and inversion theorem (Statements and applications only) – Cumulants, Chebychev's inequality – Simple problems.

UNIT-4: Concepts of bivariate distribution – Correlation : Rank correlation coefficient – Concepts of partial and multiple correlation coefficients – Regression : Method of Least squares for fitting Linear, Quadratic and exponential curves – simple problems.

UNIT-5: Standard distributions – Binomial, Hyper geometric, Poisson, Normal and Uniform distributions – Geometric, Exponential, Gamma and Beta distributions, Inter-relationship among distributions.

Reference books :

1. Hogg R.V.&Craig A.T.1988);Introduction to Mathematical Statistics,Mcmillan
2. Mood A.M & Graybill F.A.&Boes D.G.(1974): Introduction to theory of Statistics,McGraw Hill.
3. Snedecor G.W.& Cochran W.G.(1967) Statistical methods, Oxford and IBH

COURSE OUTCOME

CO1: Understand the concept of measures of central tendency and skewness.
CO2: Summarize the concepts of Sample space and random variable.
CO3: Compute the problems related to random variables.
CO4: Explain the concept of bivariate distribution and solve the problems based on it.
CO5: Illustrate the problems in standard distributions.

Subject Name: **Vector Calculus, Fourier Series And Fourier Transforms** **Year : II**
Subject Code: TAB4A **Semester: IV**

VECTOR DIFFERENTIATION: Gradient, divergence, curl, directional derivative, unit normal to a surface.

VECTOR INTEGRATION: line, surface and volume integrals; theorems of Gauss, Stokes and Green. (without proof) - simple problems

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FOURIER SERIES: Expansions of periodic function of period 2π ; expansion of even and odd functions; half range series.

FOURIER TRANSFORM: Infinite Fourier transform (Complex form, no derivation); sine and cosine transforms; simple properties of Fourier Transforms; Convolution theorem; Parseval's identity.

Reference books :

1. Engineering Mathematics volume 3 ; M.K.Venkatraman (National Publishing Co.)
2. Engineering Mathematics volume 3:P.K.andasamy (S.Chand and Co.)
3. Vector Analysis :Murray Spiegael (Schaum Publishing co ,NewYork)
4. Vector Analysis;P.Duraipandian and Lakshmi Duraipandian(Emerald Publishrers)

COURSE OUTCOME

CO1: Calculate Gradient, divergence, curl, directional derivatives and unit normal to the surface.
CO2: Examine the line, surface and volume integrals .
CO3: Evaluate the problems by using Gauss, Stokes and Green theorems.
CO4: Understand the expansion of periodic functions, expansion of even and odd functions and Half range series.
CO5: Compute the Fourier transforms and its properties.

Subject Name: Statics **Year : II**
Subject Code: TAB4B **Semester: IV**

FORCES: Types of forces, magnitude and direction of the resultant of the forces acting on a Particle, Lami's Theorem, equilibrium of a particle under several coplanar forces, parallel forces, moments, couples-simple problems.

FRICTION: Laws of friction angle of friction, equilibrium of a body on a rough inclined plane acted on by several forces, centre of gravity of simple uniform bodies, triangular lamina, rods Forming a triangle, trapezium, centre of gravity of a circular arc, elliptic quadrant, solid and Hollow hemisphere, solid and hollow cone, catenary-simple problems.

Reference books :

1. Mechanics – P.Duraipandian and oters S.Chand and Co.
2. Statics - K.Viswanathan naik and M.S.Kasi, Emerald Publishers.
3. Statics – S.Narayanan and others , S.Chand and Co.
4. Statics – A.V.Dharmapadam, S.Viswanathan and Co.

COURSE OUTCOME

CO1: Discuss Types of forces, magnitude and direction of the resultant force.
CO2: Understand Lami's theorem and equilibrium of a particle under the several coplanar forces.
CO3: Discuss Laws of friction and angle of friction.
CO4: Evaluate the Equilibrium of a body on a rough inclined plane acted upon by several forces
CO5: Calculate the Centre of gravity of uniform bodies, triangular lamina, elliptic quadrant, catenary, circular arc, solid and hollow hemisphere.

Subject Name: Mathematical Statistics-II **Year : II**
Subject Code: SBAOB **Semester: IV**

UNIT-1: Sampling Theory – Sampling distributions - concept of standard error – sampling distribution based on Normal distribution : t, chi-square and F distribution.

UNIT-2: Point estimation - concepts of unbiasedness, consistency, efficiency and sufficiency - Cramer Rao inequality - methods of estimation : Maximum likelihood, moment and minimum chi-square and their properties (Statement only).

UNIT-3: Test of Significance- standard error – large sample tests. Exact tests based on Normal, t, chi-square and F distributions with respect to population mean/means, proportion/proportions, variances and correlation co-efficient. Theory of attributes – tests of independence of attributes based on contingency tables – goodness of fit tests based on Chi-square.

UNIT-4: Analysis of variance: one way, two-way classification – Concepts and problems, interval estimation – confidence intervals for population mean/means, proportion/proportions and variances based on Normal, t, chi-square and F.

UNIT-5: Tests of hypothesis : Type I and Type II errors – power of test – Neyman Pearson Lemma – Likelihood ratio tests – Concepts of most powerful test – (Statements and results only) Simple problems.

Reference books :

1. Hogg R.V.&Craig A.T.1988);Introduction to Mathematical Statistics,Mcmillan
2. Mood A.M & Graybill F.A.&Boes D.G.(1974): Introduction to theory of Statistics,McGraw Hill.
3. Snedecor G.W.& Cochran W.G.(1967) Statistical methods, Oxford and IBH
4. Hoel P.G.(1971): Introduction to Mathematical Statistics, Wiley
5. Wilks S.S.Elementary Statistical Analysis, Oxford and IBH.

COURSE OUTCOME

CO1: Explain the concepts of sampling distribution, normal distribution and solving the problems based on it.
CO2: Solve the problems based on consistency, efficiency and sufficiency.
CO3: Understand how to test the significance of standard error based on contingency tables.
CO4: Evaluate the problems based on analysis of variance in one way and two way classification.
CO5: Summarize the concepts of test of hypothesis and solve the problem based on it.

Subject Name: Practical- Mathematical Statistics **Year : II**
Subject Code: SBAO1 **Semester: IV**

1. Construction of univariate and bivariate frequency distributions with samples of size not exceeding 200.
2. Diagrammatic and Graphical Representation of data and frequency distribution.
3. Cumulative frequency distribution – Ogives – Lorenz curve.
4. Measure of location and dispersion (absolute and relative), Skewness and Kurtosis.
5. Numerical Problem involving derivation of marginal and conditional distributions and related measures of Moments.
6. Fitting of Binomial, Poisson and Normal distributions and tests of goodness of fit.
7. Curve fitting by the method of least squares.
   (i) y=ax+b ; (ii) y=ax^2+bx+c ; (iii) y=ae^bx ; (iv) y=ax^b
8. Computation of correlation coefficients and regression lines for raw and grouped data. Rank correlation coefficient.
9. Asymptotic and exact test of significance with regard to population mean, proportion, variance and coefficient of correlation.
10. Test for independence of attributes based on contingency table.
11. Confidence Interval based on Normal, t, Chi-square statistics

COURSE OUTCOME

CO1: Understand the concepts in diagrammatic and graphical representation of data and frequency distribution.
CO2: Calculate the measures of dispersion, skewness and kurtosis.
CO3: Fit binomial, Poisson and Normal distributions, and test the goodness of fit.
CO4: Compute correlation and regression lines for raw and grouped data.
CO5: Analyze the test of significance for mean, proportion, variance based on normal, t, chi-square statistics.

Subject Name: Environmental Studies **Year : II**
Subject Code: ENV4A **Semester: IV**

UNIT I: Multidisciplinary nature of environmental studies;Scope and importance; concept of sustainability and sustainable development.

UNIT 2: What is an ecosystem? Structure and function of ecosystem;Energy flow in an ecosystem:Food chains, food webs and ecological succession,
Case studies of the following ecosystem:

a) Forest ecosystem
b) Grassland ecosystem
c) Desert ecosystem
d) Aquatic ecosystem (ponds, stream, lakes, rivers, ocean, estuaries)

UNIT 3: Land resources and land use change: Land degradation, soil erosion and desertification.
Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.Water: Use and over – exploitation of surface and ground water, floods, droughts, conflicts over water (international and inter – state).Energy resources: Renewable and non-renewable energysources, use of alternate energy sources, growing energy needs, case studies.

UNIT 4: Levels of biological diversity:genetics, species and ecosystem diversity, Bio graphic zones of India: Biodiversity patterns and global biodiversity hot spotsIndia as a mega-biodiversity nation, Endangered and endemic species of India.Threats to biodiversity: Habitatloss, poaching of wild life conflicts,man- wildlife conflicts, biological invasions; Conservations of bio diversity: In-situ and Ex-situ conservation of biodiversity.Ecosystem and bio diversity services: Ecological,economic,social, ethical, aesthetic and informational value.

UNIT 5: Environmental pollution: types, causes, effects and controls: Air, water, soil and noise pollution.Nuclear hazards and human health risks.Solid waste management: Control measures of urban and industrial waste.Pollution case studies.

UNIT 6: Environmental policies and practices **:**Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.Environment laws: Environment protection Act, Air (prevention &control of pollution) Act; water (prevention &control of pollution) Act; Wild life protection Act; Forest conservation Act. International agreements: Montreal and Kyoto protocols and convention on biological diversity (CBD).Nature reserves, tribal populations and rights, and human wild lifeconflicts in India context.

UNIT 7: Human communities and the environment: Humanpopulation population growth, impacts on environment, human health and welfare.Resettlement and rehabilitation of projects affected persons; case studies.Disaster management:floods,earthquake, cyclone and landslides.Environmental movements: chipko, silent valley, Bishnois of Rajasthan.Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.Environmental communication and public awareness, case studies (e.g. CNG vehicles in Delhi)

UNIT 8: Visit to an area to document environmental assets: rivers / forest/ flora / fauna etc.Visit to a local polluted site – Urban / Rural / Industrial / Agricultural.Study of common plants, insects, birds and basic principles of identification.Study of simple ecosystem – pond, river, Delhi Ridge etc.

Suggested Readings:

1.Carson R 2002 Silent Spring Houghton Mifflin Harcourt
2.Gadgil M. & Guha R.1993.This Fissured land: An Ecological History of India.Univ.of California Press.
3. Glesson B and Low N (eds.) 1999. Global Ethics and Environment,London Routledge.
4. Gleick P.H 1993.Water Crisis.Pacific Institute for Studies in Dev.,Environment and Security.StockHolm Env.Institute, Oxford Univ.Press.

COURSE OUTCOME

CO1: Discuss Scope and importance of EVS
CO2: Create Public Awareness on environmental issues
CO3: Explain Structure and functions of ecosystem
CO4: Enumerate Renewable and non-renewable natural resources
CO5: Describe Biodiversity, environmental pollution, environmental policies and practices**.**
CO6: Explain Link between human communities and the environment.

Subject Name: Algebraic Structures-I **Year : III**
Subject Code: TAB5A **Semester: V**

GROUPS: Subgroups, cyclic groups and properties of cyclic groups; Lagrange's Theorem, Normal subgroups, Homomorphism; Automorphism, Cayley's Theorem; Permutation groups.

RINGS: Definition and examples, Integral domain, homomorphism of rings; Ideals and quotient rings, prime and maximal ideal, the field of quotient of an integral domain; Euclidean Rings.

Refernce book :

1. Contents and treatment as in " Topic in Algebra " – I.N. Herstein, Wiley EASTERN Ltd.
2. Chapter 2 : Section – 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9 , 2.10
3. Chapter 3 : Section – 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7,

COURSE OUTCOME

CO1: Understand the concepts of Groups, subgroups, cyclic groups and Lagrange's theorem.
CO2: Explain the concepts of normal subgroups and quotient groups, homomorphism and automorphism.
CO3: Summarize the Cayley's theorem and permutation group.
CO4: Describe the concepts of homomorphism of rings, ideals and quotient rings.
CO5: Summarize the concepts of the field of quotient of an integral domain, Euclidean rings.

Subject Name: Real Analysis-I **Year : III**
Subject Code: TAB5B **Semester: V**

SETS AND FUNCTIONS: Sets and elements; Operations on sets; functions; real valued functions; equivalence; countability ; real numbers; least upper bounds.

SEQUENCES OF REAL NUMBERS: Definition of a sequence and subsequence; limit of a sequence; convergent sequences; divergent sequences; bounded sequences; monotone sequences. Operations on convergent sequences; operations on divergent sequences; limit superior and limit inferior; Cauchy sequences.

SERIES OF REAL NUMBERS: Convergence and divergence; series with non-negative numbers; alternating series; conditional convergence and absolute convergence; tests for absolute convergence; series whose terms form a non-increasing sequence; the class l^2

LIMITS AND METRIC SPACES: Limit of a function on a real line; Metric spaces; Limit in metric spaces.

COURSE OUTCOME

CO1: Learn the concepts of operations on sets, functions, real valued functions, countability and least upper bounds.
CO2: Understand the limits of a sequence, convergent and divergent sequences, bounded and monotone sequence.
CO3: Apply the concepts of operations on convergent and divergent sequences, limit superior and inferior, Cauchy sequences to solve problems based on it.
CO4: Summarize the concepts of convergent and divergent series, alternating series, conditional and absolute convergence.
CO5: Analyze the concepts in metric spaces, limits in metric spaces and function continuous on a metric space.

Subject Name: Dynamics **Year : III**
Subject Code: TAB5C **Semester: V**

KINEMATICS: Kinematics of a particle, velocity, acceleration, relative velocity, angular velocity, Newton's laws of motions, equations of motions, rectilinear motion under constant acceleration , simple harmonic motion.

PROJECTILES: Time of flight, horizontal range, Range in an inclined plane. Impulse and impulsive motion, collision of two smooth spheres, Direct and oblique impact- simple problems

CENTRAL FORCES: Central orbit as plane curve, p-r equations of a central orbit, finding law of force and speed for a given central orbit, finding the central orbit for a given law of force.

MOMENT OF INERTIA: Moment of inertia of simple bodies, theorems of parallel and perpendicular axes, moment of inertia of triangular lamina, circular lamina, circular ring, right circular cone, sphere(Hollow and solid).

COURSE OUTCOME

CO1: Derive equation of motion under constant acceleration.
CO2: Explain the concepts of rectilinear motion under force simple harmonic motion along horizontal line and vertical line.
CO3: Summarise impulse and impulsive motion, collision of two spheres both direct and oblique.
CO4: Derive central orbit as plane curve and p-r equation and hence find the law of force and speed for the given orbit.
CO5: Summarize the concepts of moment of inertia and equation of motion for two dimensional motions and apply the concepts to solve problems.

Subject Name: Discrete Mathematics **Year : III**
Subject Code: TAB5D **Semester: V**

UNIT-1: Integers; Set, some basic properties of integers Mathematical induction, divisibility of integers, representation of positive integers.

UNIT-2: Boolean algebra; Boolean algebra, two element Boolean algebra, Disjunctive normal form, Conjunctive normal form.

UNIT-3: Boolean algebra and its Application, simplication of circuits, Designing of switching circuits, Logical Gates and Combinatorial circuits.

UNIT-4: Recurrence relation and generating functions: Sequence and recurrence relation, Solving recurrence relations by iteration method, Modeling of counting problems by recurrence relations, Linear (difference equations) recurrence relations with constant coefficients, Generating functions, Sum and product of two generating functions, Useful generating functions, Combinatorial problems.

UNIT-5: Introduction to graph theory: Introduction Walk, Path and cycles, Euler circuit.

Recommended book: "Introduction to Discrete Mathematics, 2nd edition,2002 by M.K.Sen and B.C. Chakraborthy Books and Allied private Ltd., Kolkata.

References books:

1. Discrete Mathematics for computer scientists and mathematicians by J.L.Mertt, Abraham Kendel and T.P. Baker prentice-hall, India.
2. Discrete Mathematics for computer scientists and by John Truss-Addition Wesley.
3. Elements of Discrete Mathematics, C.L.Liu, New York Mcgraw-Hill,1977.
4. Discrete Mathematical structures with applications to computer science,J. T. Tremblay and R. P. Manohar, New York Mcgraw-Hill,1975.
5. Discrete Mathematical structures, Bernard Kolman, Robert C. Busby, Shron Ross, 3rd edition,1998, Prentice hall of India, New Delhi.

COURSE OUTCOME

CO1: Understand sets, properties of integer, mathematical induction and representation of positive integers.
CO2: Explain the concepts of elements of Boolean algebra, disjunctive and conjunctive normal forms and solving the problems related to it.
CO3: Describe the concepts of simplification of circuits, designing of switching circuits, logical gates and combinatorial circuits.
CO4: Summarize the concepts of sequence and recurrence relation, sum and products of two generating functions and combinatorial problems.
CO5: Paraphrase the concepts of walk, path and cycles and Euler's circuits.

Subject Name: Database Management System Using VB **Year : III**
Subject Code: TAB5E **Semester: V**

UNIT-1: Form –Form Property - variables – data types – string – numbers - Writing simple programs – toolbox – Creating controls – name property – command button – access keys – image controls – text boxes – labels – Radio buttons- Check box - Frame- message boxes.

UNIT-2: Displaying information – Determinate loops – indeterminate loops – conditional statement – built-in functions (String, Numeric) – functions and procedures. Arrays – controls arrays – Lists box combo boxes.

UNIT-3: Flex grid control – projects with multiple forms – Menus-MDI forms. Data access techniques: SQL- DDL- DML and Query command. ADO – Connection object – Recordset object – Connecting VB with Back end RDBMS.

UNIT-4: Database Management System – Advantages – Components – Feasibility Study – Class Diagram – Events - Normalization – 1 NF – 2 NF – 3 NF.

UNIT-5: Forms and Reports: Design of form and Report – Form Layout – Reports – Procedural Languages– Data on Form - Programs to Retrieve and Save Data.

Recommended Texts:l

1. Gary Cornell. *Visual Basic 6 from the Ground up.* Tata McGraw Hill – 1999.
2. G. V. Post – Database Management Systems Designing and Building Business Application – McGraw Hill International edition – 1999.

Reference Books:

1. Raghu Ramakrishnan – Database Management Systems – WCB/McGraw Hill – 1998.
2 .C.J. Date – An Introduction to Database Systems – 7th Edition – Addison Wesley - 2000.
3. Noel Jerke. *Visual Basic 6 (The Complete Reference)* Tata McGraw Hill, 1999.

COURSE OUTCOME

CO1: Understand the controls of visual programming.
CO2: Identify the control structures used in VB.
CO3: Create the project with multiple forms.
CO4: Compare the Normal forms.
CO5: Describe the effective design of forms and reports

Subject Name: RDBMS Lab **Year : III**
Subject Code: TAB51 **Semester: V**

Use VB as the front end tool and any RDBMS (Oracle or MySQL or any standard RDBMS) as the back end tool. Create database and performing the operations given below using a Menu Driven program: Insertion, (b)Deletion, (c)Modification, (d)Generating simple reports.

Payroll

1. Mark sheet Processing
2. Savings bank account for banking
3. Student information system
4. Electricity bill preparation system
5. Telephone directory maintenance.

COURSE OUTCOME

CO1: Create database using Oracle.
CO2: Apply the database connectivity through Oracle.
CO3: Design the Menu-Driven program to perform various operations.
CO4: Combine multiple forms in a application
CO5: Generate various data report.

Subject Name: Value Education **Year : III**
Subject Code: VAE5Q **Semester: V**

UNIT-1: Value education-its purpose and significance in the present world-Value system-The role of culture and civilization-holistic living-Balancing the outer and inner-Body, Mind and Intellectual level-duties and responsibilities.

UNIT-2: Salient values for life-Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity, and inclusiveness, Self -esteem and Self- confidence , punctuality-Time, task and resources management – Problem solving and decision making skills-Interpersonal and Intra personal relationship-Team work-Positive and creative thinking.

UNIT-3: Human Rights-Universal Declaration of Human Rights-Human Rights violations-National Integration-Peace and non-violence- Dr. APJ Kalam's ten points for enlightened citizenship-Social Values and Welfare of the citizen –The role of media in value building.

UNIT-4: Environment and Ecological balance-interdependence of all beings-living and non-living. The binding of man and nature-Environment conservation and enrichment.

UNIT-5: Social Evils-corruptions , Cyber- crime, Terrorism-Alcoholism, Drug addiction-Dowry-Domestic violence –untouchability -female infanticide-atrocities against women-how to tackle them.

Books for Reference :

1. MG. Chitakra: Education and Human Values, A.P.H. Publishing Corporation, New Delhi, 2003.
2. Chakravarthy, S.K. : Values and ethics for organization: Theory and Practice,Oxford University Press, New Delhi, 1999.
3. Satchidananda, M.K. : Ethics, Education, Indian Unity and Culture, Ajantha Publications, Delhi, 1991.
4. Das, M.S. & Gupta, V.K.: Social Values among young adults: A chaning Scenario, M.D. Publicatoins, New Delhi, 1995.
5. Bandiste, D.D.: Humanist Values: A source book, B.R. Publishing Corporation, Delhi, 1999.
6. Ruhela, S.P.: Human Values and education, Sterling publications, new delhi, 1986.
7. Kaul, G.N.: Values and education in independent indian Associated publishers, Mumbai, 1975.
8. NCERT, Education in values, New Delhi, 1992.
9. Swami Budhananda (1983) How to build character A primer: Ramakrishna mission, New delhi.
10. A Cultural heritage of india (4 vols), Bharatiya vidya bhavan, Bombay. (Selected chapters only)
11. For life, for the future : Reserves and Remains – UNESCO Publication.

COURSE OUTCOME

CO1: Discuss Self-esteem, ego, anger manifestation, Indian ethos in ethics and individuals personality in the eyes of others

CO2: Describe Leadership, ethical business decisions, basic principles of professional ethics and mass media ethics.

CO3: Explain Effects of advertising, value of faith, social awareness and commitment and the steps for the protection of environment

CO4: Analyse Impact of globalization and consumer awareness, signs for an everlasting peace, evolution of human rights and the international law in operation

CO5: Discuss Intellectual activities and responsibility of citizen.

Subject Name: Algebraic Structures-II **Year: III**
Subject Code: TAB6A **Semester: VI**

VECTOR SPACES: Definition and examples, linear dependence and linear independence, Dual spaces, Inner product spaces

LINEAR TRANSFORMATION: Algebra of linear transformation; characteristic roots, Matrices; canonical forms; triangular forms.

Recommended book: "Topics in Algebra"- I.N Herstein- Wiley Eastern Ltd.
Chapter 4- sections 4.1 to 4.4
Chapter 6- sections 6.1 to 6.4

References books:

1. University Algebra- N.S Gopalakrishnan- New Age International Publications, Wiley Eastern Ltd.
2. First courses in Algebra- John B. Fraleigh, Addison Wesley.
3. Text book of Algebra- R. Balakrishna and N. Ramabadran, Vikas publishing Co.
4. Algebra- S.Arumugam, New Gamma publishing house, palayamkottai.

COURSE OUTCOME

CO1: Understand the concepts of vector space, elementary basic concepts, linear independence and basis
CO2: Analyse the concepts of dual space
CO3: Describe the concepts of inner product space
CO4: Explain the concepts of algebra of linear transformation and characteristics roots.
CO5: Summarize the concepts of matrices, canonical forms and triangular forms.

Subject Name: Real Analysis-II **Year: III**
Subject Code: TAB6B **Semester: VI**

Continuous functions on metric spaces: functions continuous at the point on the real line, reformulation, functions continuous on a metric spaces, Open sets; closed sets; Discontinuous function on the real line

Connectedness, Completeness and Compactness; more about open sets**,** connected sets, bounded sets, and totally bounded sets, complete metric spaces, compact metric spaces, continuous function on a compact metric spaces, continuity of inverse functions, uniform continuity.

Calculus: Sets of measure zero, definition of the Riemann integral, existence of the Riemann integral (statement only) ; properties of Riemann integral,Derivatives, Rolle 's Theorem, Law of mean, Fundamental theorems of calculus, Taylor's theorem.

Sequence and series of functions: Pointwise convergence of sequences of functions, uniform convergence of sequences of functions.

Recommended book: "Methods of Real Analysis"- Richard R. Goldberg(Oxford and IBH publishing Co).
Chapter 5 and 6 full, Chapter 7, sections 7.1 to 7.8, Chapter 8, section 8.5 only, Chapter 9, sections 9.1 and 9.2 only.

COURSE OUTCOME

CO1: Understand the concepts of open and closed sets, discontinuous functions and connected sets and solving problems based on it.
CO2: Summarize the concepts of bounded and totally bounded set, complete and compact metric space, continuity of inverse function and uniform continuity.
CO3: Learn the concepts of sets of measure zero, Riemann Integral , existence and properties of Riemann integral.
CO4: Explain the concepts of Rolle's theorem, law of Mean, and fundamental theorems of calculus and solve problems based on it.
CO5: Understand and apply the concepts of Taylor's theorem, pointwise convergence and uniform convergence of sequences to compute the problems.

Subject Name: Complex Analysis **Year: III**
Subject Code: TAB6C **Semester: VI**

Complex Numbers: Point at infinity, stereographic projection.

Analytic functions: Functions of a complex variable - mappings, limits - theorems on limits continuity, derivatives, differentiation formulae - Cauchy-Riemann equations - sufficient conditions for differentiability - Cauchy - Riemann equations in polar form - analytic functions - harmonic function.

Mapping by elementary functions: Linear functions - The transformation w=1/z - linear fractional transformations - an implicit form - exponential and logarithmic transformations.

Integrals: Definite integrals,contours – line integrals - Cauchy- Goursat theorem (without proof) - Cauchy integral formula - derivatives of analytic function - maximum moduli of functions.

Series: Convergence of sequence and series -Taylor's series (without proof) - Laurent's series - zeroes of analytic functions..

Residues and poles: Residues - Residue theorems – the principle part of functions, poles - Evaluation of improper integrals - Improper integrals , integrals involving sines and cosines - definite integrals involving sines and cosines .

Recommended book:

1. "Complex Variables and applications"-Ruel V. Churchill, James W. Brown and Roger F. Verhey-Mc Grawhill International student edition.

References books:

1. Theory and problems of complex Variables- Murray R. Spiegel, Schaumoutline series
2. Complex Analysis – P. Duraipandian.
3. Introduction to Complex Analysis S. Ponnuswamy, Narosa Publishers 1993.

COURSE OUTCOME

CO1: Explain the concepts of theorems on limits, continuity, derivatives, differentiation and formulae, Cauchy Riemann equation, analytic and harmonic function.
CO2: Understand linear fractional transformation, exponential and logarithmic transformations.
CO3: Apply the concepts of Cauchy integral formula and fundamental theorem of algebra to solve problems.
CO4: Interpret the concepts of convergence of sequences and series, Taylor's series and Laurent's series.
CO5: Summarize and apply the concepts of Residues and Poles to solve problems.

Subject Name: Operating Systems **Year : III**
Subject Code: TAB6D **Semester: VI**

UNIT-1: Introduction: Views –Goals –Types of system – OS Structure –Components – Services System Structures – Layered Approach - Virtual Machines - System Design and Implementation. Process Management: Process - Process Scheduling – Cooperating Process – Threads - Inter process Communication. CPU Scheduling CPU Schedulers – Scheduling criteria – Scheduling Algorithms

UNIT-2: Process Synchronization: Critical-Section problem - Synchronization Hardware – Semaphores – Classic Problems of Synchronization – Critical Region – Monitors. Deadlock : Characterization – Methods for handling Deadlocks – Prevention, Avoidance, and Detection of Deadlock - Recovery from deadlock.

UNIT-3: Memory Management: Address Binding – Dynamic Loading and Linking – Overlays– Logical and Physical Address Space - Contiguous Allocation – Internal & External Fragmentation . Non Contiguous Allocation: Paging and Segmentation schemes – Implementation – Hardware Protection – Sharing - Fragmentation.

UNIT-4: Virtual Memory: Demand Paging – Page Replacement - Page Replacement Algorithms– Thrashing. – File System: Concepts – Access methods – Directory Structure –Protection Consistency Semantics – File System Structures – Allocation methods – Free Space Management.

UNIT-5: I/O Systems: Overview - I/O Hardware – Application I/O Interface – Kernel I/O subsystem – Transforming I/O Requests to Hardware Operations – Performance. Secondary Storage Structures: Protection – Goals- Domain Access matrix – The security problem – Authentication – Threats – Threat Monitoring – Encryption.

Recommended Texts:

1. Silberschatz A., Galvin P.B., Gange,. 2002 , Operating System Principles Sixth Edition, John Wiley & Sons.

Reference Books:

1. H.M. Deitel ,1990, An Introduction to Operating System,- Second Edition, Addison Wesley.

COURSE OUTCOME

CO1: Understand the operating system, process management and CPU scheduling techniques.
CO2: Describe the process of synchronization and deadlock.
CO3: Compare Paging and Segmentation in memory management.
CO4: Differentiate the page replacement algorithms.
CO5: Explain Kernel I/O sub system.

Subject Name: Programming In Java **Year : III**
Subject Code: TAB6E **Semester: VI**

UNIT-1:Introduction to Java-Features of Java-Basic Concepts of Object Oriented Programming-Java Tokens-Java Statements- Constants-Variables-Data Types- Type Casting-Operators- Expressions-Control Statements: Branching and Looping Statements.

UNIT-2:Classes, Objects and Methods-Constructors-Methods Overloading-Inheritance-Overriding Methods- Finalizer and Abstract Methods-Visibility Control –Arrays, Strings and Vectors- String Buffer Class-Wrapper Classes.

UNIT-3:Interfaces-Packages-Creating Packages-Accessing a Package-Multithreaded Programming-Creating Threads-Stopping and Blocking a Thread-Life Cycle of a Thread-Using Thread Methods-Thread Priority-Synchronization-Implementing the Runnable Interface.

UNIT-4 :Managing Errors and Exceptions-Syntax of Exception Handling Code-Using Finally Statement-Throwing Our Own Exceptions-Applet Programming-Applet Life Cycle-Graphics Programming-Managing Input/Output Files: Concept of Streams- Stream Classes-Byte Stream Classes-Character Stream Classes – Using Streams-Using the File Class-Creation of Files-Random Access Files-Other Stream Classes.

UNIT-5 :Network basics –socket programming – proxy servers – TCP/IP – Net Address – URL – Datagrams -Java Utility Classes- Introducing the AWT: Working with Windows, Graphics and Text- AWT Classes- Working with Frames-Working with Graphics- Working with Color-Working with Fonts-Using AWT Controls, Layout Managers and Menus.

Recommended Texts:

1. E. Balagurusamy,2004,Programming with JAVA, 2nd Edition,Tata McGraw-Hill Publishing Co.Ltd.
2. Herbert Schildt,2005,The Complete Reference Java™ 2, 5th Edition,Tata McGraw-Hill Publishing Co. Ltd.

Reference Books :

1. Y. Daniel Liang ,2003, An Introduction to JAVA Programming, Prentice-Hall of India Pvt.Ltd.
2. Cay S. Horstmann and Gary Cornell,2005, Core Java™2 Volume I-Fundamentals, 7th Edition- Pearson Education.
3. Ken Arnold, James Gosling and David Holmes,2003, The Java™ Programming Language,3rd Edition, Pearson Education.

COURSE OUTCOME

CO1: Understand the fundamentals of Object Oriented Programming.
CO2: Compare overloading and overriding.
CO3: Describe the life cycle of a thread.
CO4: Implement exception handling mechanism.
CO5: Understand the Java AWT classes.

Subject Name: Programming In Java Lab **Year : III**
Subject Code: TAB61 **Semester: VI**

APPLICATIONS:

1. Substring Removal from a String. Use String Buffer Class.
2. Determining the Perimeter and Area of a Triangle. Use Stream Class.
3. Determining the Order of Numbers Generated randomly using Random Class.
4. Usage of Calendar Class and Manipulation.
5. Implementation of Point Class for Image Manipulation.
6. String Manipulation Using Char Array.
7. Database Creation for Storing E-mail Addresses and Manipulation.
8. Implementing Thread based Applications and Exception Handling.
9. Text files (copy, display, counting characters, words and lines)
10. 10.Data file creating and processing for electricity billing.

COURSE OUTCOME

CO1: Perform the string operations using string buffer class.
CO2: Implement the point class for image manipulation.
CO3: Create the Thread based Applications.
CO4: Perform the operations on text and data file.
CO5: Design the java application using AWT controls.