Department of Computer Science (Shift – I & II)

Program Outcome

Graduates of the program should be able to:

PO1: Communicate effectively to represent their views or ideas with team members and able to write reports.

PO2: Understand the responsibility of their profession in society and environment with professional ethics.

PO3: Contribute their technical skills to bring solutions to the problems of environmental sustainability.

PO4: Update continuously to the latest technology in order to survive in the ever-changing IT scenario.

Program Specific Outcome

PSO1: Solve solution to computing problems.

PSO2: Solve mathematical and statistical problems.

PSO3: Design and implement software systems that meet user requirements.

SYLLABUS

Subject Name: Programming In C   **Year: I**
Subject Code:SAE1A   **Semester: I**

Unit 1: C fundamentals Character set - Identifier and keywords - data types - constants - Variables - Declarations - Expressions - Statements - Arithmetic, Unary, Relational and logical, Assignment and Conditional Operators - Library functions.

Unit-2: Data input output functions - Simple C programs - Flow of control - if, if-else, while, do-while , for loop, Nested control structures - Switch, break and continue, go to statements - Comma operator.

Unit 3: Functions –Definition - proto-types - Passing arguments - Recursions. Storage Classes - Automatic, External, Static, Register Variables – Multi-file programs.

Unit-4: Arrays - Defining and Processing - Passing arrays to functions – Multi-dimension arrays - Arrays and String. Structures - User defined data types - Passing structures to functions - Self-referential structures – Unions - Bit wise operations.

Unit-5 : Pointers - Declarations - Passing pointers to Functions - Operation in Pointers - Pointer and Arrays - Arrays of Pointers - Structures and Pointers - Files : Creating , Processing ,Opening and Closing a data file.

1. Recommended Texts
   1. E.Balaguruswamy, 1995,Programming in ANSI C, TMH Publishing Company Ltd.
2. Reference Books
   1. B.W. Kernighan and D.M.Ritchie, 1988,The C Programming Language, 2nd Edition, PHI.
   2. H. Schildt, C,2004, The Complete Reference, 4th Edition, TMH
   3. Gottfried,B.S, 1996,Programming with C, Second Edition, TMH Pub. Co. Ltd., New Delhi .
   4. Kanetkar Y., 1999,Let us C, BPB Pub., New Delhi.

COURSE OUTCOME

CO1: Describe basic programming concepts like algorithms, flow charts and write C
        programs.
CO2: Develop conditional and iterative statements in programs.
CO3: Discuss various storage classes and function types.
CO4: Construct programs using pointers and allocate memory using dynamic memory
        management functions.
CO5: Perform various file operations.

I Summation of Series :
      1. Sin(x), 2. Cos(x),   3. Exp(x) (Comparison with built in functions)

II String Manipulation :
1. Counting the no. of vowels, consonants, words, white spaces in a line of text and array of lines
2. Reverse a string & check for palindrome.
3. Substring detection, count and removal
4. Finding and replacing substrings

III Recursion :
1. $^n P_r$, $^n C_r$
2. GCD of two numbers
3. Fibonacci sequence
4. Maximum & Minimum
5. Towers of Hanoi.

IV Matrix Manipulation :
    1.Addition & Subtraction
    2.Multiplication
    3.Transpose, and trace of a matrix
    4.Determinant of a Matrix

V Sorting and Searching :
1. Insertion Sort
2. Bubble Sort
3. Linear Search
4. Binary Search

COURSE OUTCOME

CO1: Implement structure of C programming, declarations and use of variables.
CO2: Compile and trace the execution of programs.
CO3: Perform operations using string functions, derived data types, pointers and arrays.
CO4: Write programs for sorting and searching.

Unit – 1   Algebra and Numerical Methods:Algebra: Summation of series simple problems.Numerical Methods: Operators E, $\triangle$,∇ difference tables, Newton-Raphson method Newton's forward and backward interpolation formulae for equal intervals, Lagrange's interpolation formula.

Unit – 2   Matrices: Symmetric, Skew-Symmetric, Orthogonal, Hermetian, Skew-Hermetian and Unitary   matrices. Eigen values and Eigen-vectors, Cayley-Hamilton theorem (without proof) –verification – Computation of inverse matrix using Cayley – Hamilton theorem.

Unit – 3   Theory of Equations: Polynomial equations with real coefficients, irrational roots, complex roots, symmetric functions of roots, transformation of equation by increasing or decreasing roots by a constant, reciprocal equaton. Newton's method to find a root approximately – simple problems.

Unit – 4   Trigonometry: Expansions of $\sin(n\theta)$ and $\cos(n\theta)$ in a series of powers of $\sin\theta$ and $\cos\theta$ – Expansions of $\sin^n\theta$,$\cos^n\theta$, $\tan^n\theta$ in a series of sines, cosines and tangents of multiples of "θ" – Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in a series of powers of "θ" – Hyperbolic and inverse hyperbolic functions – Logarithms of complex numbers.

Unit – 5   Differential Calculus: Successive differentiation, n^{th} derivatives, Leibnitz theorem (without proof) and applications, Jacobains, Curvature and radius of curvature in Cartesian co-ordinates, maxima and minima of functions of two variables, Lagrange's multipliers – Simple problems

1. Reference Books
1. S. Narayanan and T.K.Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.
2. P. Duraipandian and S. Udaya Baskaran, Allied Mathematics, Vol. I & II Muhil Publications Chennai.

COURSE OUTCOME

CO1: Evaluate the summation of series, Operators, Newton-Raphson Method, Newton's forward and backward formulae, Lagrange's Formula.
CO2: Calculate symmetric, Skew-Symmetric, Hermetian,Eigen Values and Vectors, Cayley – Hamiltontheorem.
CO3: Determine Polynomial Equations, irrational and complex roots, transformation of equation,Reciprocalequation, Newton's Method.
CO4: Explain the concepts of expansions of *sinθ, cosθ* and *tanθ*in a series of powers of"θ" Hyperbolic and inverse hyperbolic function, Logarithms.
CO5: Understand the concepts of Successive differentiation, Leibnitz theorem, Jacobians, maxima and minima of functions, Lagrange's multipliers.

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

Unit 3: Retail location factors – Branding in Retailing – private labeling – Franchising concept

Unit-4: Communication tools used in Retailing – Sales promotion, e-tailing – 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: Learn the importance of Retail Marketing
CO2: Discuss the types of Retailing.
CO3: Describe Branding in Retailing.
CO4: Understand the Communication Tools used in Retailing.
CO5: Explain the Role of Information Technology in Retailing**.**

Subject Name: Digital Electronics & Microprocessors   **Year: I**
Subject Code: SAE2B   **Semester: II**

Unit 1: Binary Systems & Code conversion,Boolean Algebra & Logic Gates – Truth Tables – Universal Gates – Simplification of Boolean functions: SOP, POS methods – K-map, – Combinational Logic: Adders & Subtractors – Multiplexer – Demultiplexer - Encoder – Decoder.

Unit-2: Sequential Logic: RS, Clocked RS, D, JK, Master Slave JK, T Flip-Flops – Shift Registers – Types of Shift Registers – Counters: Ripple Counter – Synchronous Counters – Up-Down Counter.

Unit 3: Introduction to Microprocessors, Microcomputers, and Assembly Language – Microprocessor Architecture and Its Operations – Memory – I/O Devices – 8085 MPU – Introduction to 8085 Instructions – Data Transfer Operations – Addressing Modes - Arithmetic, Logic and Branch Operations – Writing Assembly Language Programs .

Unit-4: Time Delay Programs: Time Delay Using One Register – Using a Register Pair – Using a Loop within Loop Technique – Counter Design with Time Delay – Stack and Subroutines – BCD to Binary Conversion and Vice-versa – BCD to HEX Conversion and Vice-versa – Binary to ASCII Conversion and Vice-versa – BCD Addition and Subtraction .

Unit-5 : 8085 Interrupt – Vectored Interrupts – Interfacing I/O Devices: Basic Interfacing Concepts – Interfacing Input Devices- Memory-Mapped I/O.

Recommended Texts
1. M. Morris Mano,2005, Digital Logic and Computer Design, Prentice-Hall of India Pvt. Ltd.
2. Ramesh S. Gaonkar,1999,Microprocessor Architecture, Programming, and Applications with the 8085, 5th Edition,Penram International Publishing (India) Pvt. Ltd.

Reference Books
1. D. P. Leach and A. P. Malvino,2002,Digital Principles and Applications,5th Edition, Tata McGraw, Hill Publishing Co. Ltd.
2. V.Vijayendran,2004,Digital Fundamentals,S. Viswanathan (Printers & Publishers) Pvt. Ltd.
3. V. Vijayendran ,2004, Fundamentals of Microprocessor – 8085, S. Viswanathan (Printers & Publishers) Pvt. Ltd.
4. N. K. Srinath,2005, 8085 Microprocessor Programming and Interfacing,Prentice-Hall of India Pvt. Ltd.

COURSE OUTCOME

CO1: Describe the knowledge binary number representation, arithmetic and Boolean algebra axioms.

CO2: Apply the concepts of counters and registers.

CO3: Understand the fundamentals of Microprocessor.

CO4: Develop Assembly Language Programs Using 8085 Instruction Sets.

CO5: Explain the various Interrupts Used in 8085 Microprocessor.

DIGITAL ELECTRONICS:
1. Verification of Truth Table for AND, OR, NOT, NAND, NOR and EX-OR gates.
2. Realisation of NOT, AND, OR, EX-OR gates with only NAND and only NOR gates.
3. Karnaugh Map Reduction and Logic Circuit Implementation.
4. Verification of DeMorgan's Law.
5. Implementation of Half-Adder and Half-Subtractor.
6. Implementation of Full-Adder and Full-Subtractor.
7. Four Bit Binary Adder
8. Four Bit Binary Subtractor using 1's and 2's Complement.

MICROPROCESSOR:
1. 8 Bit Addition and Subtraction.
2. 16 Bit Addition.
3. BCD Addition .
4. BCD Subtraction.
5. 8 Bit Multiplication.
6. BCD Multiplication.
7. 8 Bit Division.
8. Searching for an Element in an Array.
9. Sorting in Ascending and Descending Orders.
10. Finding Largest and Smallest Elements from an Array.
11. Reversing Array Elements.
12. Block Move.

COURSE OUTCOME

CO1: Construct the Logical Circuit for AND, OR, NOT, NAND, NOR and EX-OR.
CO2: Prove NAND and NOR gates are Universal gates.
CO3: Design the Circuit for Adder and Subtractor.
CO4: Develop Assembly Language Programs for Arithmetic Operation using 8-bit and 16-bit.
CO5: Illustrate Various operations block move, Sorting and Reverse the Numbers using memory allocation.

Subject Name: Allied Mathematics II   **Year: I**
Subject Code: SBAMN   **Semester: II**

Unit-1: Integral Calculus: Bernoulli's formula $\int_0^{\frac{\pi}{2}} sinnxdx$, , $\int_0^{\frac{\pi}{2}} Cos^n xdx$, $\int_0^{\frac{\pi}{2}} sin^m xCos^n xdx$ Reduction formulae- (m,n being positive integers), Fourier Series for functions in(a,a+2ð), Half range sine and cosine series.

Unit–2: Differential Equations: Ordinary Differential Equations Second order non-homogenous differential equations with constant coefficients of the form ay''+by'+cy=X where X is of the form $e^{ax}cosbx$ and $e^{ax}sinbx$. Partial Differential Equations: Formation, complete integrals and general integrals, four standard types and solving lagrange's linear equation $P_{P+Q} q = R$ verification – Computation of inverse matrix using Cayley – Hamiltonian theorem.

Unit–3: Laplace Transforms Laplace transformations of standard functions and simple properties, inverse laplace transforms, Application to solution of linear differential equations up to 2nd order – simple problems.

Unit–4: Vector Differentiation: Introduction, Scalar point functions, Vector point functions, Vector differential operator N, Gradient, Divergence, Curl, Solenoidal, irrotational, identities.

Unit–5: Vector Integration: Line, Surface and volume integrals, Gauss, Stoke's and Green's theorems(without proofs). Simple problems on these.

Book for Reference:

1. S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan
  Printers, 1986, Chennai.
2. P. Duraipandian and S. Udaya Baskaran, Allied Mathematics, Vol. I & II Muhil Publications Chennai.

COURSE OUTCOME

CO1: Describe the concepts of Bernoulli's Formula, Reduction Formula, Fourier series, Half range series.
CO2: Determine the Second order non-homogeneous differential equations, In P.D.E formation and four standard types, Lagrange's linear equation.
CO3: Evaluate Laplace transformation, Inverse Laplace transforms, Application to solution of linear differential equations up to second order.
CO4: Calculate Scalar and Vector point functions, Gradient, Divergence, Curl, Solenoidal.
CO5: Explain the concepts of Surface and Volume integrals, Gauss, Stoke's and Green's Theorems and Problems.

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

Unit – 1: Introduction to Insurance - Type of Insurance - Principles of Insurance.
Unit – 2: Salient features of IRDA Act - Administration of IRDA Act- Regulatory
measures of IRDA
Unit – 3: Life Insurance products — Term, Whole life, Endowment.
Unit – 4: Introduction to general Insurance - fire, marine and motor insurance
Unit – 5: 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. ii. Dr.A.Muthy — Elements of Insurance, Margham Publications, Chennai.
3. iii.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: Discuss the Types of Insuarnce and Principles of Insurance.
CO2: Understand Administration of IRDA Act.
CO3: Describe Life Insurance Products.
CO4: Learn the introduction of General Insurance.
CO5: Learn the Government and Insurance Companies.

Subject Name: Programming In C++ And Data Structures   **Year: II**
Subject Code: SAE3A   **Semester: III**

Unit 1: 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 and Virtual Functions

Unit-2: Classes and Objects; Constructors and Destructors; and Operator Overloading and Type Conversions - Type of Constructors - Function overloading. Inheritance : Single Inheritance - Multilevel Inheritance - Multiple Inheritance - Hierarchical Inheritance - Hybrid Inheritance. Pointers, Virtual Functions and Polymorphism; Managing Console I/O operations.

Unit 3: 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. Data Structures: Definition of a Data structure - primitive and composite Data Types, Asymptotic notations, Arrays, Operations on Arrays, Order lists.

Unit-4: Stacks - Applications of Stack - Infix to Postfix Conversion, Recursion, Maze Problems - Queues - Operations on Queues, Queue Applications, Circular Queue. Singly Linked List - Operations, Application - Representation of a Polynomial, Polynomial Addition; Doubly Linked List - Operations, Applications.

Unit-5 : Trees and Graphs: Binary Trees - Conversion of Forest to Binary Tree, Operations - Tree Traversals; Graph - Definition, Types of Graphs, Hashing Tables and Hashing Functions, Traversal - Shortest Path; Dijkstra's Algorithm.

1. Recommended Texts
1. E. Balagurusamy,1995,Object Oriented Programming with C++, Tata McGraw-Hill
   Publishing Company Ltd.
2.E.Horowitz and S.Shani,1999,Fundamentals of Data Structures in C++ , Galgotia Pub.

COURSE OUTCOME

CO1: Define basics of OOP concepts of C++.
CO2: Construct object oriented programs using C++ and implement data structure
    concepts such as stacks, queues, trees, graphs.
CO3: Understand Constructors and Destructors.
CO3: Design and implement programs using operator overloading.

1. Implement PUSH, POP operations of stack using   Arrays.
2. Implement PUSH, POP operations of stack using   Pointers.
3. Implement add, delete operations of a queue using Arrays.
4. Implement add, delete operations of a queue using Pointers.
5. Conversion of infix to postfix using stack operations
6. Postfix Expression Evaluation.
7. Addition of two polynomials using Arrays and Pointers.
8. Creation, insertion, and deletion in doubly linked list.
9. Binary tree traversals (in-order, pre-order, and post-order) using linked list.
10.Depth First Search and Breadth first Search for Graphs using Recursion.

COURSE OUTCOME

CO1: Implement Stack and Queue operations in C++.
CO2: Develop programs for evaluating expressions using infix and postfix operations.
CO3: Apply the concepts of singly linked lists, doubly linked lists and in C++.
CO4: Execute programs for graph search using depth first and breadth first methods.

Subject Name: Statistical Method And Their Applications-I   **Year: II**
Subject Code: SBAOC   **Semester: III**

Unit-1: Nature and scope of statistical methods and their limitations − Classification, tabulation and diagrammatic representation of various types of statistical data - Frequency curves and Ogives − Graphical determination of percentiles, quantiles and their uses, Lorenz curve.

Unit-2: Sampling from finite population − Simple random sampling, Stratified and systematic random sampling procedures − Estimation mean and total and their standard errors. Concepts of sampling and non-sampling errors.

Unit-3: Measures of location − Arithmetic mean, median, mode, Geometric mean, Harmonic mean and their properties − merits and demerits. Measures of dispersion − Range, mean deviation, quartile deviation, standard deviation, coefficient of variation, skewness and kurtosis − and their properties.

Unit-4: Probability of an event − Finitely additive probability space addition and multiplication theorems − independence of events − conditional probability − Bayer' theorem.

Unit-5: Bivariate frequency table and its uses − scatter diagram − Correlation and Regression lines − linear prediction − Rank correlation coefficient − curve fitting by the method of least squares − Partial and multiple correlation coefficients.

Books for study References:
1. Mode, E.B.: Elements of Statistics − Prentice Hall
2. Wilks, S.S.: Elementary Statistical Analysis − Oxford and IBH
3. Snedecor, G.W.,& Cochran, W.G.(1967): Statistical Methods, Oxford and IBH
4. Simpson and Kafka: Basic Statistics
5. Burr, I.W.: Applied Statistical Methods, Academic Press.
6. Croxton, F.E. and Cowden, D.J.: Applied General Statistics, Prentice Hall
7. Ostleo, B.: Statistics in Research, Oxford & IBH.

COURSE OUTCOME

CO1: Understand the concepts of Frequency curves and Ogives-graphical determination of percentiles, quantiles and their uses, Lorence curve.
CO2: Describes the concepts of Sampling from finite population, types of sampling, conceptsof sampling and non-sampling errors.
CO3: Evaluate and Measures of location, measures of dispersion.
CO4: Explain the concepts of Finitely additive probability space addition and multiplication theorems, conditional probability, Baye's Theorem.
CO5: Compute Bivariate frequency table, Correlation & Regression, Least Square Method.

Subject Name: Programming In Java   **Year: II**
Subject Code: SAE4A   **Semester: IV**

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, New Delhi.
2. Herbert Schildt,The Complete Reference Java^{TM} , 2- 5th Edition,Tata McGraw-Hill Publishing Co. Ltd,New Delhi.

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^{TM}2 Volume I,Fundamental 7th Edition,Pearson Education.

COURSE OUTCOME

CO1: Describe the concepts of Java programming.
CO2: Implement Java classes using interfaces, overriding concepts.
CO3: Develop applets using Abstract Window Toolkit concepts.
CO4: Understand basics of networks.

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. Usage of Vector Classes.
9. Interfaces and Packages
10. Implementing Thread based Applications and Exception Handling.
11. Application using Synchronization such as Thread based, Class based and Synchronized Statements.
12. Textfiles (copy, display, counting characters, words and lines)
13. Data file creating and processing for electricity billing.
14. Data file creating and processing for telephone billing

APPLETS:

15. Working with Frames and Various Controls.
16. Working with Dialog Box and Menus.
17. Working with Colors and Fonts.
18. Drawing various shapes using Graphical statements.
19. Working with panel and all types of Layout.
20. Design a simple calculator with minimal of 10 operations
21. Usage of buttons, labels, text components in suitable application
22. Usage of Radio buttons, check box ,choice list in suitable application.

COURSE OUTCOME

CO1: Use of basic object oriented programming concepts in Java to integrate library packages.
CO2: Create an application with database and applets.
CO3: Apply decision and iteration control structures to implement algorithms

Subject Name: Statistical Method And Their Applications-II   **Year: II**
Subject Code: SBAOD   **Semester: IV**

Unit-1: Concepts of random variable – Mathematical exception – Moments of random variable (raw and central moments) – Moment generating function – Chebycheff's inequality – simple problems.

Unit-2: Standard distributions – Binomial, Poisson and Normal distributions – Fitting of distribution.

Unit-3: Concepts of sampling distributions – standard error – Tests of significance based on t, Chi-square arid F – distribution with respect to mean, variance and correlation coefficient. Theory of attributes and tests of independence in contingency table.

Unit-4: Principle of scientific experiments – Randomization, replication, and local control. Analysis of variance – One way and two way classification Analysis of CRD and RBD – Latin square design. Concepts of factorial experiments (without confounding).

Unit-5: Non parametric tests – Comparison between parametric and Non-parametric tests – Sign tests – Runs test for one and two sample problems – Wilcoxon signed Rank test – Mann Whitney U test.

Books for Study and References:
1. Mode, E.B.: Elements of Statistics – Prentice Hall
2. Wilks, S.S.: Elementary Statistical Analysis – Oxford and IBH
3. Snedecor, G.W., & Cochran, W.G.: Statistical Methods, Oxford and IBH
4. Simpson and Kafka: Basic Statistics
5. Burr, I.W.: Applied Statistical Methods, Academic Press.
6. Croxton, FE. And Cowden, D.J.: Applied General Statistics, Prentice Hall
7. Ostleo, B.: Statistics in Research, Oxford & IBH.
8. Sydney Siegel – Non-parametric Methods for Behavioural Sciences.
9. Daniel, W W – Biostatistics.

COURSE OUTCOME

CO1: Explain the Concepts of Random variable, Mathematical Expectation, Moment generating function.
CO2: Describes the concepts of Standard distribution, Binomial, Poisson and Normal Distribution, Fitting of distribution.
CO3: Analyze the concepts of Sampling Distributions, Standard Error, Test of significance based on t, Chi-square andF-distribution.
CO4: Calculate Principle of scientific experiments, Analysis of variance, one and two way classification ofCRD and RBD, Latin square designs
CO5: Compute the Nonparametric tests, sign test, Wilcoxon signed Rank test, Mann Whitney U test.

1. Construction of univariate and bivariate frequency distribution distribution with samples of size not proceeding 200.

2. Diagrammatic and graphical representation of various statistical data and frequency distribution.

3. Cumulative frequency curve and Lorenz curves.

4. Computation of various measures of location, dispersion, moments, skewness and kurtosis.

5. Curve fitting by the method of least squares.
   (i)$y=ax + b$; (ii) $y= ax2 + bx + C$; (iii) $y=ae$ bx (iv) $y=axb$

6. Computation of correlation coefficients – regression lines (raw data and grouped data) – correlation coefficients, Partial and Multiple Correlation coefficients.

7. Fitting of Binomial, Poisson and Normal distributions and testing goodness of fit.

8. Large sample test – tests for proportions.

9. Exact test based on t, Chi-square, and F distribution with regard to mean, variance and correlation coefficients.

10. Estimation of mean and r total and their standard errors in simple, stratified and systematic random sampling procedure.

COURSE OUTCOME

CO1: Analyse and compute Univariate and bivariate frequency, Diagrammatic and graphical representation.

CO2: Describe the concepts Cumulative frequency curve and Lorenz curves, Measures of location, dispersion, skewness and kurtosis.

CO3: ExplainCurve fitting by Least Square Method, Correlation and Regression lines,

CO4: Illustrate Fitting Binomial, Poisson and Normal distribution, large sample test

CO5: Compute exact test based on t, Chi-square, F-distribution, Correlation coefficients, Standard errors.

CO6: Classify Analysis of variance and classifications, Analysis of CRD, RBD and Latin square designs.

Subject: 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: Operating Systems   Year: III
Subject Code: SAE5A   Semester: V

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 - Interprocess 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: Explain manage resources, understand synchronizing concurrent processes and handling deadlocks.
CO2: Describe process management and concepts of Threading, multitasking, IPC.
CO3: Differentiate the various scheduling algorithms and identified the reasons of Deadlock and their remedial measures.

Subject Name: Database Management Systems   **Year: III**
Subject Code: SAE5B   **Semester: V**

Unit 1: Advantages and Components of a Database Management Systems – Feasibility Study – Class Diagrams – Data Types – Events – Normal Forms – Integrity – Converting Class Diagrams to Normalized Tables – Data Dictionary.

Unit-2: Query Basics – Computation Using Queries – Subtotals and GROUP BY Command – Queries with Multiple Tables – Subqueries – Joins – DDL & DML – Testing Queries

Unit 3: Effective Design of Forms and Reports – Form Layout – Creating Forms – Graphical Objects – Reports – Procedural Languages – Data on Forms – Programs to Retrieve and Save Data – Error Handling.

Unit-4: Power of Application Structure – User Interface Features – Transaction – Forms Events – Custom Reports – Distributing Application – Table Operations – Data Storage Methods – Storing Data Columns – Data Clustering and Partitioning.

Unit-5: Database Administration – Development Stages – Application Types – Backup and Recovery – Security and Privacy – Distributed Databases – Client/Server Databases – Web as a Client/Server System – Objects – Object Oriented Databases – Integrated Applications.

Recommended Texts
   1. 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.

COURSE OUTCOME

CO1: Design an application's using conceptual modeling tools like ER Diagrams, Schemas, Database languages and SQL commands.
CO2: Differentiate Data base management system and file processing system.
CO3: Apply normalization techniques for efficient retrieval of data.

Subject Name: Computer Architecture And Organization   **Year: III**
Subject Code: SAE5C   **Semester: V**

Unit 1: Computer Evolution: Pentium and Power PC Evolution. Computer System: Components – Function – Interconnection Structures – Bus Interconnection – Basics of PCI Bus. Memory: Characteristics – Hierarchy – Cache Memory – Principles – Cache Design – Locality of Reference.

Unit-2: Main Memory: Static RAM – Dynamic RAM – Types of ROM – Memory Chip Organization – Types of DRAM. External Memory: Magnetic Disk – Basics of RAID – Optical Memory – Magnetic Tapes

Unit 3: Input/Output: External Devices – I/O Module – Programmed I/O – Interrupt Driven I/O – DMA – I/O Channels & Processors. Computer Arithmetic: ALU – Integer Representation and Arithmetic – Floating Point Representation and Arithmetic. Instruction Set: Characteristics – Operand Types – Operation Types – Addressing Modes – Instruction Formats – Pentium and Power PC Operands, Operations, Addressing Modes (Simple Examples).

Unit-4: CPU: Organization of Processors and Registers – Instruction Cycle – Instruction Pipelining – Pentium Processor. RISC: Characteristics – Large Register File – Register Optimization – Architecture – RISC Vs CISC Characteristics – Pipelining.

Unit-5: Control Unit: Micro-Operations – Control of Processors – Hardwired Implementation - Micro Programmed Control Concepts – Microinstruction Sequencing – General Microinstruction Execution.

Recommended Texts
1. W. Stallings ,2003,Computer Organization and Architecture, 6th Edition- PHI,New Delhi.

Reference Books
1. C. Hamacher, Z. Vranesic, S.Zaky, 2002, Computer Organization,5th Edition,Mcgraw Hill.

COURSE OUTCOME

CO1: Discuss computer performance and characteristics of memory
CO2: Differentiate between programmed I/O and Interrupt driven I/O.
CO3: Explain Pipeline instruction set.
CO4: Illustrate the Microprogrammed control concepts.

Subject Name: Visual Programming   **Year: III**
Subject Code: SEE5A   **Semester: V**

Unit 1: Customizing a Form - Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button - Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types - String - Numbers.

Unit-2: Displaying Information - Determinate Loops - Indeterminate Loops - Conditionals - Built-in Functions - Functions and Procedures.

Unit 3: Lists - Arrays - Sorting and Searching - Records - Control Arrays - Combo Boxes - Grid Control - Projects with Multiple forms - DoEvents and Sub Main - Error Trapping.

Unit-4: VB Objects - Dialog Boxes - Common Controls - Menus - MDI Forms - Testing, Debugging and Optimization - Working with Graphics.

Unit-5 : Monitoring Mouse activity - File Handling - File System Controls - File System Objects - COM/OLE - automation - DLL Servers - OLE Drag and Drop.

Recommended Texts
1. Gary Cornell - Visual Basic 6 from the Ground up - Tata McGraw Hill - 1999.
2. Noel Jerke - Visual Basic 6 (The Complete Reference) - Tata McGraw Hill – 1999

COURSE OUTCOME

CO1: Design front-end using Visual basic controls and accessing data from the back-end SQL.
CO2: Describe fundamentals of visual programming and Graphical User Interface.
CO3: Discuss various control structures, functions and procedures of visual programming and write simple programs.

Subject Name: RDBMS Lab   **Year: III**
Subject Code: SAE51   **Semester: V**

Create database and performing the operations given below using a Menu Driven program: Insertion, (b)Deletion, (c)Modification, (d)Generating a reports (Simple) for the following Systems using any RDBMS package :

1. Payroll
2. Mark sheet Processing
3. Savings bank account for banking
4. Inventory System
5. Invoice system
6. Library information system
7. Student information system
8. Income tax processing system
9. Electricity bill preparation system
10. Telephone directory maintenance.

COURSE OUTCOME

CO1: Implement Common SQL Statement including DDL, DML, and DCL Statements to perform different operations.
CO2: Apply embedded and nested queries and views of table for different users.

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-Holisti c 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 Resource management- Problem solving and Decision-making skills – Inter personal and Intra personal relationship – Team work – Positive and Creative thinking.

Unit – 3: Human Rights – Universal Declaration of Human rights – Human rights violation -National Integration- Peace and non – violence – Dr. A. P.J 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 wellbeing – living and non – living. The binding of man and nature – Environment conservation and enrichment.

Unit – 5: Social Evils – Corruption, Cybercrime, 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: Explain basic principles of professional ethics and mass media ethics.

CO2: Compare leadership, ethical business decisions

CO3: Describe value of faith, social awareness and commitment

CO4: Analyze Impact of globalization and consumer awareness

CO5: Discuss Evolution of human rights and the international law in operation

Subject Name: Data Communication And Networking   **Year: III**
Subject Code:SAE6A   **Semester: VI**

Unit 1: Introduction to Data Communication, Network, Protocols & standards and standards organizations - Line Configuration - Topology - Transmission mode - Classification of Network - OSI Model - Layers of OSI Model.

Unit-2: Parallel and Serial Transmission - DTE/DCE/such as EIA-449, EIA-530, EIA-202 and x.21 interface - Interface standards - Modems - Guided Media - Unguided Media - Performance - Types of Error - Error Detection - Error Corrections.

Unit 3: Multiplexing - Types of Multiplexing - Multiplexing Application - Telephone system - Project 802 - Ethernet - Token Bus - Token Ring - FDDI - IEEE 802.6 - SMDS - Circuit Switching - Packet Switching - Message switching - Connection Oriented and Connectionless services.

Unit-4: History of Analog and Digital Network - Access to ISDN - ISDN Layers - Broadband ISDN - X.25 Layers - Packet Layer Protocol - ATM - ATM Topology - ATM Protocol.

Unit-5: Repeaters - Bridges - Routers - Gateway - Routing algorithms - TCP/IP Network, Transport and Application Layers of TCP/IP - World Wide Web.

Recommended Texts
1. Behrouz and Forouzan,2001,Introduction to Data Communication and Networking, 2nd Edition,TMH.

Reference Books
1. Jean Walrand 1998,Communication Networks (A first Course),Second Edition, WCB/McGraw Hill.
2. Behrouz and Forouzan,2006,Data Communication and Networking,3nd Edition ,TMH.

COURSE OUTCOME

CO1: Explain importance, concept and techniques in data communication with standards and protocols, different layers in networking and communication.
CO2: Illustrate layered approach to networking and understand various application layer protocols.
CO3: Explain basic principles of data communication, networks, protocol, standard topology and signals.

Subject Name: Web Technology   **Year: III**
Subject Code:SAE6B   **Semester: VI**

Unit 1: Introduction to` VBScript - Adding VBScript Code to an HTML Page -   VB Script Basics - VBScript Data Types - VBScript Variables - VBScript Constants - VBScript Operators – mathematical- comparison-logical - Using Conditional Statements - Looping Through Code - VBScript Procedures – type casting variables - math functions –date functions – string functions –other functions - VBScript Coding Conventions - Dictionary Object in VBScript - Err Object

Unit-2: Introduction to Javascript – Advantages of Javascript – Javascript syntax - Data type –Variable   - Array – Operator & Expression – Looping – control structures - Constructor Function – user defined function Dialog Box .

Unit 3: Javascript document object model – Introduction – Object in HTML – Event Handling – Window object – Document object – Browser object – Form object – Navigator object – Screen object – Build in object – User defined object – Cookies.

Unit-4: ASP.NET Language Structure – Page Structure – Page event , Properties & Compiler Directives . HTML server controls – Anchor, Tables, Forms, Files . Basic Web server Controls – Lable, Text box, Button, Image Links, Check & radio Button, Hyperlink, Data List Web Server Controls – Check box list. Radio button list, Drop down list, List box, Data grid, Repeater.

Unit-5:   Request and Response Objects, Cookies, Working with Data – OLEDB connection class, command class, transaction class, data adaptor class, data set class. Advanced issues – email, Application issues, working with IIS and page Directives, error handling. Security – Authentication, IP Address, Secure by SSL & Client Certificates

Recommended Texts
   1. i.I.Bayross, 2000, Web Enable Commercial Application Development Using HTML,   DHTML, Javascript, Perl CGI, BPB Publications.
   2. ii. A.Russell Jones, Mastering Active Server Pages 3, BPB Publications.

Reference Books
 1. Hathleen Kalata, Internet Programming with VBScript and JavaScript, Thomson Learning
 2. Mike McGrath, XML Harness the Power of XML in easy steps, Dreamtech Publications
 3. T.A. Powell, 2002,Complete Reference HTML , TMH.
 4. J.Jaworski, 1999, Mastering Javascript, BPB Publications.
 5. Powell, Thomas; Schneider, Fritz, JavaScript: The Complete Reference, 2nd edition
 6. 2004, TMH

COURSE OUTCOME

CO1: Discuss HTML code, VB Script, Java Script and Asp. Net to create web pages with aesthetic sense of designing.

CO2: Create and communicate between client and server, to create good and effective dynamic websites.

CO3: Analyze and apply the role of languages like HTML.

VB SCRIPT & JAVASCRIPT

1. Write a program outputs the squares, roots, cubes and complements of integers between 1 and 100.
2.Create a calculator.
3. Write a script to Sort numbers and strings
4. Create a program to generate a hit counter
5. Create a program to verify whether email address provided by user is valid or invalid.
6. Write a program to scroll the text on status bar.
7. The form consists of two multiple choice list and one single choice list
      a. the first multiple choice list display the major dishes available.
      b. the second Multiple choice list display the stocks available.
      c. The single choice list display the miscellaneous
        (Milkshakes, soft drinks, softy available etc.)
8. Write a script to create a digital clock.
9. Create a web page using two image file which switch black and white one another as the mouse pointer moves over the image. Use the On Mouse over and OnMouseEvent, OnDblClick handler
10. Build a WWW page with an image and 3 buttons., Pick three favorite graphics, Label the buttons and make each one swap in the graphic you have chosen
11. Create a frameset that has two frames, side by side. Make the left-hand frame contain a form with 3 radio buttons.
    The buttons should be for three search engines:
        • Yahoo (http://www.yahoo.com)
        • Altavista (http://www.altavista.com)
        • Infoseek (http://www.infoseek.com)
When the user clicks on of the option buttons, the frame on the right hand side should be loaded with the right search engine.
12.Write a program to implement Employee database with all validation.

ASP

1. Create a login form, to expire, if the user does not type the password within 100 seconds.
2.Create an employee database and manipulate the records using command object in ASP
3. Develop an application to illustrate the usage of Request and Response Objects in ASP.
4. Write an ASP program using Request Object to give the exact list of headers sent by the browser to the Web server.
5. Create an Active Server Page to display the records one by one from a student database. The student database should contain roll no, name, marks & total.
7. Design an ASP application that describes books in the Online Bookshop.(Use AD Rotator Component, Content Rotator Component, Content Linking Component)

8. Create a document and add a link to it. When the user moves the mouse over the link it should load the linked document on its own (User is not required to click on the link).

9. Create a document, which opens a new window without a toolbar, address bar, or a status bar that unloads itself after one minute.

10. Create a document that accepts the user's name in a text field form and displays the same the next time when the user visits the site informing him that he has accessed the site for the second time, and so on.

COURSE OUTCOME

CO1: Create a static web site using HTML and add dynamic functionality to it by using JavaScript.

CO2: Develop Graphical User Interface applications and web based applications.

Subject Name: Object Oriented Analysis And Design　　　　　**Year: III**
Subject Code: SEE6D　　　　　　　　　　　　　　　　　　**Semester: VI**

Unit 1: System Development - Object Basics - Development Life Cycle - Methodologies - Patterns - Frameworks - Unified Approach - UML.

Unit-2: Use-Case Models - Object Analysis - Object relations - Attributes - Methods - Class and Object responsibilities - Case Studies.

Unit 3: Design Processes - Design Axioms - Class Design - Object Storage - Object Interoperability - Case Studies.

Unit-4: User Interface Design - View layer Classes - Micro-Level Processes - View Layer Interface - Case Studies.

Unit-5 : Quality Assurance Tests - Testing Strategies - Object orientation on testing - Test Cases - test Plans - Continuous testing - Debugging Principles - System Usability - Measuring User Satisfaction - Case Studies.

Recommended Texts

1. Ali Bahrami - Object Oriented Systems Development - McGraw Hill International Edition - 1999.
2. Grady Booch- Object Oriented Analysis and design –Addison Wesley.

COURSE OUTCOME

CO1: Classify various phases of software development life cycle and develop software using object oriented techniques and methodologies with case studies.
CO2: Apply object-oriented approach from traditional approach to design and development the system.
CO3: Construct various UML models for various development stages of System using the appropriate UML notations.
CO4: Analyze and apply design issues to rectify the performance and good system design that is recognized by various object relationships like inheritance, association and dependency.

Subject Name: Software Engineering   **Year: III**
Subject Code: SEE6G   **Semester: VI**

Unit 1: Introduction to Software Engineering Some definition – Some size factors – Quality and productivity factors – Managerial issue. Planning a Software Project: Defining the problem – Developing a solution strategy – planning the development process – planning an organization structure – other planning activities.

Unit-2: Software Cost Estimation: Software – Cost factors – Software cost estimation techniques – specification techniques – level estimation – estimating software maintenance costs. The software requirements specification – formal specification techniques - languages and processors for requirements specification.

Unit 3: Software Design: Fundamental Design concepts – Modules and modularizing Criteria – Design Notations – Design Techniques – Detailed Design Consideration – Real time and distributed system design – Test plan – Mile stones walk through and inspection.

Unit-4: Implementation issues : Structured Coding techniques – coding style – standards and guidelines – documentation guidelines – type checking – scooping rules – concurrency mechanisms.

Unit-5: Quality assurance – walk through and inspection - Static analysis – symbolic exception – Unit testing and Debugging – System testing – Formal verification: Enhancing maintainability during development – Managerial aspects of software maintenance – Configuration management – source code metrics – other maintenance tools and techniques.

Recommended Texts
1. Richard E.Fairly - Software Engineering Concepts - Tata McGraw-Hill book Company.

Reference Books
1. R.S.Pressman, 1997, Software Engineering – 1997 - Fourth Ed., McGraw Hill.
2. Rajib Mall ,2004,Fundamentals of Software Engineering,2nd Edition, PHI.

COURSE OUTCOME

CO1: Describe phases of software development life cycle by analyzing the software
requirements, designing, coding and testing using different strategies.
CO2: Apply the concepts of software quality assurance and enhance team work ability in
project scheduling.
CO3: Develop skill for cost estimation of software development and understand the
software Risks.