

BHARATHIAR UNIVERSITY, COIMBATORE.
MASTER OF COMPUTER APPLICATIONS (MCA) DEGREE COURSE
(Affiliated Colleges - Effective from the academic Year 2014-2015)

SCHEME OF EXAMINATIONS – CBCS PATTERN

Semester	Study Components	Course title	Ins. hrs/ week	Examinations				Credit
				Dur.	CIA	Marks	Total Marks	
I	Paper I : Introduction to Information Technology		4	3	25	75	100	3
	Paper II : Computer Organization and Architecture		4	3	25	75	100	3
	Paper III : Problem Solving in C		4	3	25	75	100	4
	Paper IV : Accounting and Financial Management		4	3	25	75	100	3
	Paper V : Web Designing		4	3	25	75	100	4
	Practical I : Problem Solving using C Lab		5	3	40	60	100	4
	Practical II : Web Designing Lab		5	3	40	60	100	4
II	Paper VI : Data Structures		4	3	25	75	100	3
	Paper VII : Relational Database Management Systems		4	3	25	75	100	4
	Paper VIII : Operating Systems		4	3	25	75	100	3
	Paper IX : Object Oriented Analysis and Design & C++		4	3	25	75	100	4
	Paper X : Mathematical Foundations of Computer Science		4	3	25	75	100	3
	Practical III : Data Structures Lab Using C++		5	3	40	60	100	4
	Practical IV : RDBMS Lab		5	3	40	60	100	4
III	Paper XI : Visual Programming		4	3	25	75	100	4
	Paper XII : Java Programming		4	3	25	75	100	4
	Paper XIII : Analysis & Design of Information Systems		4	3	25	75	100	3
	Paper XIV: Computer Networks		4	3	25	75	100	3
	Paper XV : Operations Research		4	3	25	75	100	3
	Practical V : Visual Programming Lab		5	3	40	60	100	4
	Practical VI : Java Programming Lab		5	3	40	60	100	4
IV	Paper XVI : .NET Programming		4	3	25	75	100	4

	Paper XVII : Computer Graphics and Multimedia	4	3	25	75	100	4
	Paper XVIII : Software Engineering	4	3	25	75	100	3
	Paper XIX : Elective – I	4	3	25	75	100	3
	Paper XX : Elective – II	4	3	25	75	100	3
	Practical VII : .NET programming Lab	5	3	40	60	100	4
	Practical VIII : Graphics and Multimedia Lab	5	3	40	60	100	4
V	Paper XXI : Software Testing	4	3	25	75	100	4
	Paper XXII : Network Security and Cryptography	4	3	25	75	100	3
	Paper XXIII : Data Mining and Warehousing	4	3	25	75	100	3
	Paper XIV : Elective – III	4	3	25	75	100	3
	Paper XXV : Elective – IV	4	3	25	75	100	3
	Practical IX : Mini Project	5	-	-	-	100*	5
	Practical X : Software Testing Lab	5	3	40	60	100	4
VI	Project work and Viva voce					200**	10
	Total					3700	135

* Project report - 80 marks; Viva-voce – 20 marks

** Project report - 160 marks; Viva-voce – 40 marks

ELECTIVE – I

E.1.1. Client Server Technology

E.1.2. Digital Image Processing

E.1.3. Open Source System

ELECTIVE – III

E.3.1. Web Services

E.3.2. Middleware Technologies

E.3.3. Neural Networks

ELECTIVE – II

E.2.1. Mobile computing

E.2.2. Distributed Computing

E.2.3. Cloud Computing

ELECTIVE – IV

E.4.1. E-Commerce

E.4.2. Embedded systems

E.4.3. Information Retrieval Techniques

Subject Title: INTRODUCTION TO INFORMATION TECHNOLOGY

Number of Instruction Hours: 4

Subject Description

This course presents the basics of data and information, acquiring graphical data, data Storage, Computer software, Computer networks, Data organization.

Goal

To enable the students to learn the basic types of data, image compression fundamentals, memory cell, CPU

Objectives

On successful completion of the course the students should have:

- Understood the concepts of data and information.
- Understood the concepts of data storage, Software, Hardware and Internet.

UNIT I

Data and Information : Types of data, simple model of a computer – Desktop computer.
Acquisition of numbers and textual data : Introduction – Input units – Internal representation of numeric data, representation of characters in computers – Error detecting codes.

UNIT II

Acquiring graphical data : Introduction – Acquisition of textual data, pictures – Storage format for pictures – Image compression fundamentals – Image acquisition with digital camera.
Acquiring audio data – Acquisition of video – Processing multimedia data – Processing and displaying textual data.

UNIT III

Data Storage : Introduction – Memory cell – RAM, ROM, Floppy Disk Drive, CD ROM, Archival Memory – Central Processing Unit - Output Devices.

UNIT IV

Computer software – Computer networks – Data organization.

UNIT V

Some Internet Applications – Email – WWW – Information Browsing Service – Information Retrieved from World Wide Web – Audio on Internet – Business Information System : Introduction – Types of information needed by organization – Why should we use computer in business – Design of operational information system – System life cycle – Computer systems for transaction processing.

REFERENCE BOOKS

1. V. Rajaraman “Introduction to Information Technology”, Prentice Hall of India, 2003.
2. Ajoy Kumar Ray & Tinku Acharya, “Information Technology – Principles and Applications”, Prentice Hall of India, 2004.
3. Research and Development Wing, IITL Education, “IT Tools and Applications”, Macmillan India Ltd., 2004.
4. S.K. Sarkar & A.K. Gupta, “Elements of Computer Science”, S. Chand & Co., 2002.

Subject Title: COMPUTER ORGANIZATION AND ARCHITECTURE

Number of Instruction Hours: 4

Subject Description:

This course presents the architecture and organization of computers.

Goal:

To enable the students to learn the basic functions, principles and concepts of Computer architecture.

Objectives:

On successful completion of the course the students should have:

- Understood computer architecture
- Understood number systems, I/O, Registers and memory

UNIT I

Number System: Binary, Decimal, Octal, Hexadecimal – Conversion from one to other – Complements - Binary codes.

Basic Logic Gates – Basic Theorems and Properties of Boolean Algebra – NAND, NOR implementation – Sum of Products – Product of Sums – Karnaugh map – Tabulation Method – Don't Care Conditions.

UNIT II

Combinational Logic Circuit Design: Multiplexers – Demultiplexers – Decoders – Encoders – Half Adder – Full Adder – Subtractor – Parallel Adders.

Flip-flops: RS, D, JK Flip-flops – Registers – Shift Registers – Ripple counters – Synchronous counters.

UNIT III

Register Transfer and Micro Operations: Arithmetic circuit – Logic Circuit – Shift Circuit – Arithmetic Logic Shift unit - Stack Organization – Instruction formats – Addressing modes – Data Transfer, Data Transfer, Manipulation and program control instructions.

UNIT IV

Input – Output organization: Peripheral Devices – Input – Output interface – Asynchronous Data Transfer (Strobe & Handshaking Method) – Modes of Transfer – Priority Interrupt – DMA – IOP.

UNIT V

Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory.

REFERENCE BOOKS

1. M. Morris Mano, "Digital Logic and Computer Design", PHI.
2. M. Morris Mano, "Computer System Architecture" Third Edition, PHI/Pearson Education.
3. Albert Paul Malvino, Donald P. Leach, "Digital Principles and Applications", Tata Mc Graw Hill Pub. Company Ltd.
4. J.P.Hayes, "Computer Architecture and Organization" Tata Mc Graw Hill
5. William Stallings, "Computer Organization & Architecture – Designing for performance", Pearson Education, Sixth Edition.

Subject Title: PROBLEM SOLVING IN C

Number of Instruction Hours: 4

Subject Description:

This course presents the Programming techniques in C, explains data types, arrays, pointers, files.

Goal:

To enable the students to learn the basic functions, principals and concepts of programming in C fundamentals.

Objectives:

On successful completion of the course the students should have:

- Understood the Programming in C language

UNIT I

Planning the Computer Program – Flow Chart – Types of Logic used in Flowchart – Computer Languages – Hierarchy of Programming Languages – Classifications of Programming Languages – Popular Programming Languages – Program development process – Characteristics of a Good Program – Program Development Process – Error in Programming.

UNIT II

An overview of C – Data types and sizes – Declarations – Variables – Constants – Operators – Expressions – Formatted and Unformatted Input / Output statements - Program Control Structures – Loop Control Structures — Arrays – Strings

UNIT III

Function – Function Arguments – Function Prototype – Recursion – Storage Classes – Structures – Unions – Bit Manipulations and Enumerations – Self-Referential Structures – Dynamic Memory Allocation.

UNIT IV

Pointers – Introduction – Pointers and Arrays – Pointers and Strings – Pointers and Functions - Pointers and Structures

UNIT V

File processing – Basic methods for FILE - Sequential Files – Random Access Files - C Preprocessors – Command Line Arguments

Low Level Programming in C – Calling BIOS and DOS Interrupts – Port I/O Functions to Access CMOS – Keyboard and Speaker – Writing into Video Buffer.

REFERENCE BOOKS

1. Yeswanth Kanetkar, "Let us C", BPB
2. Yeswanth Kanetkar, "TSR through C", BPB
3. Ashok N.Kamthane. "Programming with ANSI and Turbo C", Pearson Education Asia
4. E.Balagurusamy, "Programming in ANSI C", Tata McGraw Hill
5. Deitel & Deitel, "C How to Program", Third Edition, PHI/Pearson Education Asia.
6. Katrikeyan.E,"A Text Book On C : Fundamentals, Data Structures and Problem Solving", Prentice Hall of India, 2008

Subject Title: ACCOUNTING AND FINANCIAL MANAGEMENT

Number of Instruction Hours: 4

Subject Description:

This course presents accounting, final accounts, Ratio analysis, Funds Flow Statement, Budget and Budgetary Control, Costing.

Goal:

To enable the students to learn the accounting fundamentals, principles and concepts.

Objectives:

On successful completion of the course the students should have:

- Understood the basics of Accounting And Financial Management.

UNIT I

Accounting: Definition, Objectives, Advantages, Accounting Concepts, Accounting Conventions. Methods of Accounting – Single Entry and Double Entry System. Basic Books of Accounts – Journal and Ledger – Preparation of Trial Balance.

Final Accounts: Trading and Profit and Loss Account and Balance Sheet of Sole Proprietary Concern.

UNIT II

Ratio Analysis: Meaning – Advantages – Limitations – Classification of Ratio : Profitability, Turnover and Solvency Ratios.

UNIT III

Funds Flow Statement: Concept of Funds – Funds flow Statement – Uses and Limitations – Preparation of Fund Flow Statement – Cash Flow Statement

UNIT IV

Budget and Budgetary Control: Meaning and Definition, Objectives of Budgetary Control, Advantages and Limitations Preparation of Different Types of Budgets.

UNIT V

Costing: Definition, Nature and Importance Advantages and Limitations of Cost Accounting – Classifications of Cost – Preparation of Cost Sheet

Marginal Costing: Meaning, Advantages – Cost – Volume Profit Analysis – Break Even Analysis – Uses and Assumptions – Applications of Marginal Costing.

REFERENCE BOOKS

1. N. Vinayakam, Mani Nagarajan, “Principles of Accountancy”, Eurasia Publishing House, New Delhi.
2. S.N. Maheswari, “Principles of Management Accounting”, Sultan Chand & Co.
3. Sharma and Sasi K. Gupta, “Management Accounting”, Kalyani Publishers.
4. T.S Grewal, “Introduction to Accountancy”, Sultan Chand & Co.
5. Ramachandran and Srinivasan, “Management Accounting”, Sri Ram Publications, Trichy.

Subject Title: WEB DESIGNING

Number of Instruction Hours: 4

Subject Description

This Course presents the basics of Web designing.

Goals:

To enable the students to learn the Programming Languages for Web designing

Objectives :

On successful completion of the course the students should have:

- Understood the fundamentals of Web design and how to program using ASP and XML.

Contents

Unit I:

Introduction to Internet – World Wide Web – Browsers: Introduction – Popular Web Browsers – know your browsers – Electronic Mail : Introduction – E-mail networks and servers – E-mail protocols – Structure of an E-mail.

Unit II:

HTML : Introduction – Getting started – Creating and saving an HTML document – Document Layout of HTML Page – HTML elements – Some other formatting Styles – Hypertext Links.

Unit III

HTML (contd) : URLs – Images – HTML tables – Frames - Forms – Special Characters – Meta tags - Style Sheet

Interactivity Tools and Multimedia : Introduction – DHTML – Scripting Languages – Java – ASP.

Unit IV

XML : XML basics – Introduction – need for XML – Advantages – Working with an XML Document – Structure of an XML Document – DTD- XML Schema

Unit V:

Working with XML Schema - Declaring Attributes – XML namespaces – Reusing Schema Components – Grouping elements and attributes. XML Style sheets : Introduction – CSS – eXtensible Style Sheet language – Formatting Data based on controls – Displaying data in a Tabular Format.

REFERENCE BOOK:

1. Internet and Web Design, IITL Education, Macmillan India Ltd..
2. HTML and XML an Introduction, NIIT, Prentice Hall of India Pvt. Ltd
3. World Wide Web Design with HTML – C. Xavier, 2007, TMH.

PRACTICAL I PROBLEM SOLVING USING 'C' LAB

1. Programs based on Control statements
2. Programs using Looping Statements
3. Programs Using One Dimensional Arrays
4. Programs Using Two Dimensional Arrays.
5. Perform various Operations on Matrices
6. Perform String Operations using String Library Functions
7. Programs to Access the Array Element using Pointers.
8. Programs Using Functions and recursive functions
9. Programs Using Pointers and Functions
10. Programs using Structure.
11. Programs using Pointer and Structure.
12. Programs Using File.
13. Programs Using Command Line Arguments
14. Programs Using BIOS / Interrupt functions

PRACTICAL II WEB DESIGN LAB

1. Develop a HTML document which displays you name as **<h1>** heading and displays any four of your friends. Each of your friend's names must appear as hot text. When you click your friend's name, it must open another HTML document, which tells about your friend.
2. Write names of several countries in a paragraph and store it as an HTML document, *world.html*. Each country name must be a hot text. When you click India (for example), it must open *india.html* and it should provide a brief introduction about India.
3. Design a HTML document describing you. Assign a suitable background design and background color and a text color.
4. Develop a HTML document to print the Text with Bullets / Numbers - Using Lists
5. Develop a HTML document to print the Table Format Data
6. Develop a Complete Web Page using Frames and Framesets which gives the Information about a Hospital using HTML
7. Write a HTML document to print your Bio-Data in a neat format using several components
8. Develop a HTML document to display a Registration Form for an inter-collegiate function.
9. Develop a HTML document to design Alumni Registration form of your college.

Subject Title: DATA STRUCTURES

Number of Instruction Hours: 4

Subject Description:

This course gives an introduction of algorithms, linked lists, internal sorting, symbol tables with case study.

Goal:

To enable the students to learn the data structure fundamentals, principles and concepts.

Objectives:

On successful completion of the course the students should have:

- Understood the various Data Structures, Algorithms for sorting and searching.

UNIT I

Introduction: Introduction of Algorithms, Analysing Algorithms. Arrays: Sparse Matrices – Representation of Arrays. Stacks and Queues. Fundamentals – Evaluation of Expression Infix to Postfix Conversion – Multiple Stacks and Queues – Perform Analyse the Algorithms.

UNIT II

Linked List: Singly Linked List – Linked Stacks and Queues – Polynomial Addition – More on Linked Lists – Sparse Matrices – Doubly Linked List and Dynamic – Storage Management – Garbage Collection and Compaction.

UNIT-III

Trees: Basic Terminology – Binary Trees – Binary Tree Representations – Binary Trees – Traversal – More on Binary Trees – Threaded Binary Trees – Binary Tree Representation of Trees – Council Binary Trees. Graphs: Terminology and Representations – Traversals, Connected Components and Spanning Trees

UNIT IV

Internal Sorting: Insertion Sort – Quick Sort – 2 Way Merge Sort – Heap Sort – Shell Sort – Sorting on Several Keys. External Sorting: Storage Devices – Sorting with Disks: K-Way Merging – Sorting with Tapes – Perform Analyze the Algorithms.

UNIT V

Symbol Tables: Static Tree Tables – Dynamic Tree Tables – Hash Tables: Hashing Functions – Overflow Handling. Files: Files, Queries and Sequential organizations – Index Techniques – File Organizations.

Case Study: Recursion – Towers of Hanoi – Simulation of an Airport – Pattern Matching in Strings – Game Trees.

REFERENCE BOOKS

1. Ellis Horowitz, Sartaj Shani, “Data and File Structures” Galgotia Publication.
2. Ellis Horowitz, Sartaj Shani, Sanguthevar Rajasekaran, “Computer Algorithms”, Galgotia Publication.

3. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, Pearson Education Asia, Second Edition.
4. Robert Kruse, C.L.Jondo, Bruce Leung, “Data Structures and Program Design in C”, PHI/Pearson Education Asia, Second Edition.
5. Tremblay Sorenson, “An introductions to Data Structures with Applications”, 2nd Edition, Tata McGraw Hill Pub Company Ltd.

Subject Title: RELATIONAL DATABASE MANAGEMENT SYSTEMS

Number of Instruction Hours: 4

Subject Description:

This course presents the introduction of database management systems , explains ER model, structure of relational database, indexing and advance data base concepts.

Goal:

To enable the students to learn the basic functions, principals and concepts of Database management systems.

Objectives:

On successful completion of the course the students should have:

- Understood the basic principles of database management systems, parallel & distributed databases.
- Gained knowledge over various database models, schemas and SQL statements.

UNIT I

Overview of database systems: Managing data- A historical perspective – File systems versus a DBMS - Advantages of a DBMS- Describing and storing Data in a DBMS - Queries in a DBMS - Transaction management – Structure of a DBMS. Database design & ER diagrams – Entities, Attributes, and Entity Sets – Relationships and Relationship Sets- Additional feature of the ER model- conceptual Database design with the ER model.

UNIT II

Relational Model: Integrity constraints over relations – Enforcing integrity constraints – Querying relational data – Logical database design : ER to Relational –Introduction to Views – Destroying / Altering Tables & Views. Relational Algebra and Calculus: Relational Algebra – Relational Calculus

UNIT III

SQL: Queries, Programming, Triggers: The form of a basic SQL Query – UNION, INTERSECT and EXCEPT – Nested Queries – Aggregate operators – Null values –Complex integrity constraints in SQL - Triggers & Active data bases. Transaction Management Overview: The ACID Properties - Transactions & Schedules – Concurrent execution of Transactions – Lock-based concurrency control – Performance of Locking –Transaction support in SQL.

UNIT IV

Schema Refinement and Normal forms: Introduction to Schema refinement – Functional dependencies – Reasoning about functional dependencies – Normal forms – Properties of Decompositions – Normalization – Schema Refinement in data base design – other kinds of dependencies. Security : Introduction to Database security -Access control – Discretionary Access control – Mandatory Access control – Additional issues to security. Concurrency control : 2PL, serializability and Recoverability – Introduction to Lock Management - Lock Conversions –Specialized Locking techniques - Concurrency control without locking.

UNIT V

Parallel & Distributed databases: Introduction – Architecture for parallel databases – Parallel Query evaluation – Parallelizing individual operations –Parallel Query Optimization – Introduction to distributed Databases – Distributed DBMS architecture sorting data in a distributed DBMS. Object Database Systems: Motivation Example – Structured data types – Operation on structured data types – Encapsulation & ADTS – Inheritance - Objects, OIDS and Reference Types - Database design for and ORDBMS – OODBMS – Comparing RDBMS, OODBMS and ORDBMS.

REFERENCE BOOKS

1. Raghuram Ramakrishnan, Johannes Gehrke –“Database Management Systems”, Third Edition, McGraw-Hill Higher Education.
2. Silberschatry, Korth, Sundarshan, “Database system Concepts”, Fourth Edition, McGraw-Hill Higher Education.
3. Elmasri, Navathe, “Fundamentals of Database Systems”, Third Edition, Pearson Education Asia.
4. S.S. Khandare, “Database Management and Oracle Programming”, First Edition, 2004, S.Chand and Company Ltd.
5. Nilesh Shah, “Database Systems using Oracle”, 2002, Prentice Hall of India.
6. Rajesh Narang, “Database Management Systems”, 2004, Prentice Hall of India.

Subject Title: OPERATING SYSTEMS

Number of Credits: 4

Subject Description:

This course presents the Introduction about operating systems, process management, CPU scheduling, memory management, secondary storage management.

Goal:

To enable the students to learn the basic functions, principles and concepts operating system.

Objectives:

On successful completion of the course the students should have:

- Understood the operating system principles
- Understood the Principles of Deadlock, processor scheduling and memory management.
- Learnt case studies in different OS

Unit-I

INTRODUCTION: Definition of OS-Mainframe System-Desktop Systems-Multi processor System-Distributed-Clustered-Real time Systems-Handheld Systems-Operating System Structure-System Components-Services-System Calls-System Programs-System Design and Implementation.

Unit-II

PROCESS MANAGEMENT: Concepts-Process Scheduling-Operations on Processes-Co-operating Processes-Inter Process Communication-CPU Scheduling-Scheduling Concepts-Criteria-Scheduling Algorithms-Multiprocessor Scheduling-Real time Scheduling.

Unit-III

PROCESS SYNCHRONIZATION: Critical Section-Synchronization Hardware-Semaphores-Problems of Synchronization-Critical Regions-Monitors-Deadlocks-Characterization-Handling Deadlocks-Deadlock Prevention-Avoidance-Detection-Deadlock Recovery.

Unit-IV

MEMORY MANAGEMENT: Storage Hierarchy-Storage Management Strategies-Contiguous-Non Contiguous Storage Allocation-Single User-Fixed Partition-Variable Partition-Swapping-Virtual Memory-Basic Concepts-Multilevel Organization-Block Mapping-Paging-Segmentation-Page Replacement Methods-Locality-Working Sets.

Unit-V

I/O AND FILE SYSTEMS: Disk Scheduling-File Concepts-File System Structure-Access Methods-Directory Structure-Protection-Directory Implementation-Allocation Methods-Free Space Management

Case Study: Linux Operating System – Commands, Shell Programming, Report writing

Reference Book

1. Silberschatz and Galvin, Operating System Concepts, 6th Edition, John Wiley & Sons, Inc., 2004
2. Milankovic M., Operating System Concepts and Design, 2nd Edition, McGraw Hill, 1992
3. P.C.Bhatt, An Introduction to Operating Systems-Concepts and Practice, Prentice Hall Of India, 2004
4. H.M.Deitel, An Introduction to Operating Systems, 2nd Edition, Pearson Education, 2002

Subject Title: OBJECT ORIENTED ANALYSIS AND DESIGN & C++

Number of Instruction Hours: 4

Subject Description:

This course presents the Object Model, classes and objects, overloading, files, exception handling, OO analysis.

Goal:

To enable the students to learn the basic functions, principles and concepts of Object oriented programming.

Objectives:

On successful completion of the course the students should have:

- Understood the Object model and relationship among objects
- Gain knowledge in C++ programming

UNIT I

The Object Model: The Evolution of the Object Model – Elements of the Object Model – Applying the Object Model. Classes and Objects: The Nature of an Object – Relationship among Objects.

UNIT II

Classes and Object: Nature of Class – Relationship Among classes – The Interplay of classes and Objects. Classification: The importance of Proper Classification – identifying classes and objects – Key Abstractions and Mechanism.

UNIT III

Introduction to C++ - Input and output statements in C++ - Declarations - control structures – Functions in C++.

UNIT IV

Classes and Objects – Constructors and Destructors – operators overloading –Type Conversion - Inheritance – Pointers and Arrays.

UNIT V

Memory Management Operators - Polymorphism – Virtual functions – Files –Exception handling - sting handling – Templates.

REFERENCE BOOKS

1. Grady Booch, “Object Oriented Analysis and Design with Applications”, Second Edition, Pearson Education.
2. Ashok N. Kamthane, “Object Oriented Programming with ANSI & Turbo C++”, First Indian Print -2003, Pearson Education.
3. Samanta “Object Oriented Programming with C++ and Java”, PHI.
4. Balagurusamy “Object Oriented Programming with C++”, TMCH, Second Edition, 2003.
5. Debasingh Jana, “C++ and Object Oriented Programming Paradigm”, 2003, PHI.

Subject Title: - MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Number of Instruction Hours: 4

Subject Description: This course presents the set theory, Introduction to Probability Theory, Automata Theory, Mathematical Logic, and Numerical Methods.

Goal: To enable the students to learn the basic functions, principals and concepts of mathematical foundations of computer science.

Objectives:

On successful completion of the course the students should have:

- Understood the set theory and Probability Theory
- Understood the Automata Theory, Mathematical Logic and Numerical Methods.

UNIT I

Matrices : Definition – Types of Matrices – Basic operations in Matrix – Determinants – Properties of Determinants – Inverse of a Matrix – Finding Eigen values and vectors – Cayley – Hamilton theorem.

UNIT II

Set Theory: Basic set operations – Relations – Types of Relations – Representation of relations in matrix form – Composition of relations – Functions – Types of functions – Principle of mathematical induction.

Boolean Algebra: Definition – Sub Boolean algebra – Boolean functions and Boolean Expression.

UNIT III

Mathematical Logic : Introduction – Connectives, NAND & NOR connectives – Tautology and Contradiction – Truth tables – Logical Networks – Normal forms – Principal disjunctive normal form – Principal conjunctive normal form – Equivalence formulae – Indirect method of proof. Predicate calculus, free and bound variables, inference theory for predicate calculus.

UNIT IV

Graph Theory : Graphs, Diagraph – Types of graph – Simple theorems – Definitions of paths, reach ability – Matrix representation – Shortest path problem – Binary trees – Traversal of binary trees – Expression trees – Infix, postfix, prefix expressions.

UNIT V

Grammars and Language : PSG – Types of grammars – Productions – Regular grammar and languages – Finite State Automata (FSA) – Deterministic and Non deterministic FSA – Conversion of NDFSA to DFSA.

REFERENCE BOOKS

1. M.K. Venkatraman, “Engineering Mathematics”, Vol II, National Publishing Co.
2. Hopcraft & Ullman , “Introduction to Automata Theory, Languages & Computation”, II edition, Pearson Education.

3. Tremblay & Manohar, "Discrete Mathematical structures with applications to computer science", TMH.
4. J.K. Sharma, "Discrete Mathematics, Macmillan India, Ltd., 2003.
5. P. Radha, T. Santha, "Discrete Mathematics for Computer Science & Applications", Kalaikathir Publications, , 2003.
6. M. Vijayaraghavan, "Foundations of Mathematics", Scitech, 2001.

PRACTICAL III **DATA STRUCTURES LAB using C++**

Write a C++ program for the following concepts and its Applications

1. Objects and Array of Objects
2. Constructor and Destructor
3. Operator Overloading and Function Overloading
4. Inheritance Concept
5. Stack and Queue Operations.
6. Recursion, Infix to Postfix Conversion.
7. Polynomial Addition using Singly Linked List.
8. Doubly Linked List Operations.
9. Tree Traversals
10. Searching – Linear, binary, Fibonacci
11. Sorting – Bubble, Insertion, Radix, shell, Quick, Heap, Merge.

PRACTICAL IV **RDBMS LAB**

Study features of commercial RDBMS packages such as Oracle and Developer 2000. laboratory exercise should include defining scheme of applications, creation of a database, writing SQL queries to retrieve information from database. Use of host language interface with embedded SQL. Use of forms and report writer package. Some sample applications, which may be programmed, are given below.

- Banking system various schemes
- Online reservation system.
- Personal information.
- Student mark processing system (Internal and External marks).
- Hotel management.
- Stock maintenance.
- College admission system. (both, UG and PG)

Subject Title: VISUAL PROGRAMMING

Number of Instruction Hours: 4

Subject Description:

This course presents an overview of VB, VC++ Programming, arrays, ODBC.

Goal:

To enable the students to learn the basic VB and concepts of arrays, VC++

Objectives:

On successful completion of the course the students should have:

- Understood VB programming
- Understood VC++ programming

UNIT I

Introduction to VB – Welcome to Visual Basic – Opening closing windows toolbars – Existing project – Auto Hide – Customizing windows placing controls on a form – Selecting and resizing controls – Relocating controls – Properties windows and setting properties of forms and controls (using properties window and using event procedure).

UNIT II

Visual Basic variables - Data types constant – Building project – Displaying output – Operators – Conditional statements – If-then, Select-case – Looping – Do, For next, Nested loops.

Import statement – Msg box – Functions – Input Box () – Functions – User defined and built-in functions – Controls.

UNIT III

Arrays – Menus and dialog boxes, structures programming – Object oriented Programming. Files classification – Handling files using function and classes – Directory class – File class – File processing.

UNIT IV

Visual C++: Programming: MFC and Windows – MFC Fundamentals – MFS Class Hierarchy – MFC Member & Global Functions – Various Object Properties – Cobject, CArchive, CWinApp, CWnd, CFile, CGD, Object, CExcept, CDialog, CString, CEdit, CList – Resources: Menus – Accelerators, Dialogs, Icons, Bitmaps, Versions – Message Maps – Document/View Architecture.

UNIT V

VC++ (Contd): connecting to Data Source – DAO – ODBC – Thread – Based Multitasking – Visual C++ APPWIZARD and class Wizard.

REFERENCE BOOKS

1. Eric A Smith, Valor Whisher, Hank Marquis, “Visual Basic 6 Programming Bible”.
2. Herbert Schildt, “MFC Programming From the Ground up” Second Edition , Tata McGrawHill.
3. MSDN Visual studio Library.
4. Cornell, “Visual Basic 6 From the Ground Up”, Tata Mcgraw – Hill Company Ltd
5. Mveller, “Visual C++ from the Ground up”, TMCH.
6. Viktor Toth, “Visual C++6 Unleashed”, Second Edition, Techmedia.

Subject Title: JAVA PROGRAMMING

Number of Instruction Hours: 4

Subject Description:

This course presents the basic concepts of object oriented programming, methods data types, class and objects, packages; overview of JDBC, Overview of Servlet technology.

Goal:

To enable the students to learn the basic functions, principles and concepts of java programming.

Objectives:

On successful completion of the course the students should have:

- Understood the basics of java programming
- Learnt multithreading, string manipulation, Java Beans and Servlets

UNIT I

Introduction: History of JAVA, JAVA class libraries – Basics of a typical JAVA environment – Arithmetic, Equality and Relational Operators – Thinking about Objects, Applet: Adding Integers (Example) – Control Structures: if, if/else, while, for, switch, do/while, break and continue – Operators: Assignment, Increment and Decrement and Logical – Primitive Data types.

UNIT II

Methods: program modules in JAVA – Methods – Method definitions – JAVA API packages – Duration of identifiers – Scope rules – Method overloading - Arrays – References and Reference parameters – Passing arrays to methods – Multiple subscripted arrays – Class scope – Controlling access to members – Creating packages – Constructors – Overloaded constructors – Set and Get methods – Final instance variables – Packages access – Using this reference – Finalizers – static Class members – Data abstraction and Information Hiding – Superclasses and Subclasses – protected members – Constructors and Finalizers in subclass – inner class definitions – Type wrapper class for primitive types.

UNIT III

String constructors – String methods: length, CharAt, getChars, hashCode, value of, intern and miscellaneous string methods – Substrings and concatenating strings – stringBuffer class – StringTokenizer Class – Graphics contexts and Graphics Objects – color and Font controls – Drawing lines, Rectangles, Ovals, Arcs, Polygons and Polylines - The JAVA2D API – Swing overview – JLabel – Event handling model – JtextField, JpasswordField, Jbutton, JcheckBox, Jradio Button, JcomboBox, Jlist, JtextArea, Jslider – Mouse event handling, Adapter classes – Layout managers – Panels – Using menus with frames – Boxlayout manager.

UNIT IV

The basics of JAVA exception handling – Try blocks – Throwing,Catching and Rethrowing an exception – Throws clause – finally block – Class **Thread**: an overview – Thread states – Thread priorities and scheduling – Thread synchronization – Runnable interface – Thread groups – Loading, displaying and scaling images – Files and Streams – Creating,

Reading and Updating a sequential access file – Creating, Writing and Reading a random access file – Class file – Reading, Inserting and Updating a database (Use JDBC to a MS Access)

UNIT V

Overview of Servlet technology - Handling HTTP GET and POST requests – Session tracking – RMI: defining, implementing the RMI – Define the Client – Compile Execute the server and the client – Networking : Reading a file on a web server – Establishing a simple server and a simple client (using stream sockets) – Random and BitSet Class – Class arrays – Interface Collection and Class Collections – Sets – Maps – JAVABEANS : Preparing a class to be a JavaBean – Creating a JavaBean – Adding Beans and Properties to a JavaBean – Connecting Beans with Events in the BeanBox – the BeanInfo class.

REFERENCE BOOKS

1. Deitel and Deitel, “Java How to Program”, Third Edition, PHI/Pearson Education Asia.
2. Keyur shah, “Java 2 programming”, Tata McGraw-Hill Pub. Company Ltd.
3. C.Xavier, “Programming with Java 2”, SciTech Publications (India) P. Ltd.
4. Cays S. Horstmann, Gary Cornell, “Core Java2 Volume I – Fundamentals”, Pearson Edition, 2001
5. Cays S. Horstmann, Gary Cornell, “Core Java2 Volume II – Fundamentals”, Pearson Edition, 2003

Subject Title: ANALYSIS & DESIGN OF INFORMATION SYSTEMS

Number of Instruction Hours: 4

Subject Description:

This course presents the Information systems analysis overview, system requirement specification, process specification and Data input methods.

Goal:

To enable the students to learn the basic types of information, overview, data dictionary

Objectives:

On successful completion of the course the students should have:

- Understood the analysis & design of information systems
- Learnt the system and process specifications and various data input methods

UNIT I

Information and Management: Types of information – Why do we need a Computer based information system – Management structure – Management and information requirements – qualities of information – Examples of information systems.

UNIT II

Information systems analysis overview: Overview of Design of an Information system – the Role and Task of a System Analyst - Attributes of a Systems Analyst – Tools used by Systems Analyst- Information Gathering : Strategy to gather information – Information Sources

– Methods of Searching for Information – Interviewing Techniques – Questionnaires – other methods of information search – Case study.

UNIT III

System Requirement Specification : Data Dictionary – Steps in systems Analysis – Modularizing requirements specification – Feasibility Analysis: Deciding on project goals – Examining alternative solutions – Evaluating proposed system – Cost-benefit analysis – Payback period – Feasibility report- system proposal – Data flow diagram : symbols used in DFDs – Describing a system with a DFD – Good conventions in developing DFDs – Logical and Physical DFDs.

UNIT IV

Process specification: Process specification methods – structured English – Decision Tables : Decision table Terminology and Development - Extended Entry Decision table - Establishing the logical correctness of decision tables – use of Karnaugh maps to detect Logical errors in Decision table – Eliminating redundant specifications

UNIT V

Data input methods: Data input – Coding Techniques – Detection of Error in Codes – Validating Input data – Interactive Data input – Designing outputs: output Devices – Objectives of Output design – Design of Output Reports – design of screens – use of Business Graphics – Control, Audit, Testing and Security of information system – System Design Example.

REFERENCE BOOKS

1. V. Rajaraman , “Analysis and Design of Information System” – 2nd Edition – Prentice-Hall of India, 2004.
2. James A Senn, “ Analysis & Design of Information Systems”, Second Edition, MCH International Edition .

Subject Title: COMPUTER NETWORKS

Number of Instruction Hours: 4

Subject Description:

This course presents the Introduction to computer networks, the physical layer, Data link layer, network layer, Session layer.

Goal:

To enable the students to learn the computer networks concepts and layer description.

Objectives:

On successful completion of the course the students should have:

- Understood the use of computer networks.
- Understood the functions of network layers

UNIT I

Introduction: Use of computer networks – Network Hardware – Network software – Reference models – Example of networks.

UNIT II

The Physical Layer: The Theoretical basis for data communication – Guided transmission Media – Wireless transmission – Communication satellites – The Public switched Telephone network – Cable Television - Mobile telephone system.

UNIT III

Data link layer: Data link layer design issues – Error detection and correction – Elementary data link protocols – Sliding window protocols – Protocol Verification - Example data link Protocols.

UNIT IV

Network layer : Network layer design issues – Routing algorithms – Congestion, Control algorithms – Quality of service – Internetworking – Network layer in the internet. Transport layer: The transport service – Elements of transport protocol – A simple transport protocol - The internet Transport Protocols : UDP – The Internet Transport Protocols : TCP - Performance issues.

UNIT V

Session layer : Design issues, synchronization - Presentation layer : Design issues, cryptography – Application layer : Design issues, file transfer, E-mail.

REFERENCE BOOKS

1. Andrew S. Tanenbaum, “Computer Networks”, IV Edition, PHI/Pearson Education,
2. P. Green – Computer Network Architectures and Protocols, Plenum Press, 1982.
3. Harry Katzan – An Introduction to “Distributed Data Processing”, A Petrocelli Book, New York / Princeton.
4. Godbole – Data Communication & Networking, TMH.
5. Leon Garcia – Communication Networks : Fundamental Concepts & Key Architecture, TMH.
6. Hari & Barani, “Projects in Networking”, 2005, SCITECH Publications

Subject Title: OPERATIONS RESEARCH

Number of Instruction Hours: 4

Subject Description:

This course presents linear programming, transportation problem, inventory control, replacement model, and queuing theory.

Goal:

To enable the students to learn the formulation of LPP, mathematical formulation, Assignment problem.

Objectives:

On successful completion of the course the students should have:

- Understood the linear programming problems & programming problems
- Understood the queuing theory & inventory control problems

UNIT I

Linear Programming : Formulation of LPP – Graphical solutions to LPP –Simplex Method - Big M method – Two – Phase Simplex Method - Duality in Linear Programming: Primal & Dual Problems – Dual Simplex Method.

UNIT II

The Transportation Problem: Introduction – Mathematical Formulation- Finding Initial Basic Feasible Solutions – Moving towards Optimality – Unbalanced Transportation Problems – Degeneracy. The Assignment Problem: Introduction – Mathematical formulation - Hungarian Assignment Method – Maximization in Assignment Problem – Unbalanced Assignment Problem – Impossible Assignment.

UNIT III

Inventory control : Introduction – Costs involved in inventory - Deterministic models : EOQ models without and with shortage - Buffer stock and Reorder Level – Price Break models – ABC Analysis.

UNIT IV

Replacement model : Introduction – Replacement of items that deteriorates gradually : value of money does not change with time – value of money changes with time – Replacement of items that fails suddenly : Individual Replacement –Group Replacement.

PERT/CPM: Introduction – Construction of Network - CPM calculations –PERT Calculations.

UNIT V

Queuing Theory : Introduction - Characteristics of queuing system - Problems of single server with finite / infinite population model – Problems of multi server with finite /infinite population model.(No derivation)

REFERENCE BOOKS

1. Kanti Swarup, P.K. Gupta, Man Mohan, “Operations Research”, Sultan Chand & Sons.
2. P.K. Gupta, D.S Hira, “Problems in Operations Research”, S.Chand & Company Ltd.
3. Hamdy A. Taha, “Operations Research – An Introduction”, Seventh Edition, PHI/Pearson Education.
4. Frederick S. Hillier, Gerald J. Lieberman, “Introduction to Operations Research”, Tata McGraw Hill Pub Company Ltd., Seventh Edition.
5. J.K.Sharma, “Operations Research Theory and Applications”, Macmillan India Ltd., Second Edition.

PRACTICAL V
VISUAL PROGRAMMING LAB

VC++ PRACTICAL LIST

1. Program to create a Window Using MFC
2. Program to implement Message Maps various mouse events
3. Program to build Arithmetic Calculator
4. Program for List Box Application
5. Program to implement Threads
6. Program to Draw Circles On Mouse Click Point
7. Program for Payroll Application using ODBC
8. Program for Students Details using DAO

Visual Basic PROGRAM LIST

1. Program for a various font application
2. Program for a notepad application
3. Program for employee details
4. Program for supplier details
5. Program for hospital management
6. Program for newspaper vendor
7. Program for simple calculator.
8. Program for create and reading text file.

PRACTICAL VI
JAVA PROGRAMMING LAB

1. Create an employee package to maintain the information about the employee. Use constructors to initialize the employee number and use overloading method to set the basic pay of the employee. By using this package create a java program.
2. Program to implement polymorphism, inheritance and inner classes.
3. Create a frame with user specific size and position it at user specific position (use command line argument). Then different shapes with different colours (use menus).
4. Java program to handle different mouse events.
5. Create an applet for a calculator application.
6. Java program to maintain the student information in text file.
7. Animate images at different intervals by using multi threading concepts.
8. Program to send a text message to another system and receive the text message from the system (use socket programming).
9. Java program by using JDBC concepts to access a database.
10. Java program to implement RMI.
11. Java program by using to implement the tree viewer.
12. Java bean program to view an image.
13. Java program that prohibit to reading of text files that containing bad words.

Subject Title: .NET Programming

Number of Instruction Hours: 4

Subject Description:

This course presents an overview of .NET Framework, VB.NET and ASP.NET Programming

Goal:

To enable the students to learn the basic concepts of .NET Framework, VB. NET and ASP.NET.

Objectives:

On successful completion of the course the students should have:

- Understood .NET Framework
- Understood VB.NET
- Understood ASP.NET

UNIT I

What is .NET Framework: What is .NET?-Requirement-What is .NET Built on? – Overview of the .NET Framework: .NET Framework Conceptual Overview – Common Language Runtime –Common Type System – Meta Data and Self describing Components – Cross- Language Interoperability – Assemblies in the Common Language Runtime –Application Domains - .NET Framework Class Library Overview – Runtime Hosts – Basic Structural Diagram of .NET Framework – Versions of .NET Framework.

UNIT II

Introduction to VB.NET – Properties windows and setting properties of forms and controls - Visual Basic.NET variables – Data Types – Constant – Building Project – Displaying Output – operators – Conditional statements – If-then, Select-case – Looping – Do, For next, nested loops. Import statement – Msg Box Functions – Input Box Functions – User defined and Built-in Functions – Controls.

UNIT III

Arrays – Menus – Built-in Dialog Boxes – Dialog classes – Files – Handling files using function and classes – Directory class – File class – File Processing.

UNIT IV

Features of ASP.NET – Developing a Web Application: ASP.NET pages – provider model – coding model – code sharing – Compilation in ASP.NET. Applications and State: Structure of an application – The global .aspx Application File – using states – HTTP handlers.

UNIT V

Web Forms - The control class – The web control class – creating buttons – Enabling and Disabling controls – Hyperlinks – The Tree view model – Menu control – Site map path control – wizard control – validation controls – Login controls – HTML controls –Developing web sites.

REFERENCE BOOKS:

1. PankajAgarwal, “Principles of .NET Framework”, Vayu Education of India, 2009.
2. Steven Holzner, “Visual Basic.NET Black Book”,Paraglyph Press, 2002.

3. CharulShukla, “ASP.NET 2.0 black book”, Paraglyph Press, 2006.
4. Cornell, “Visual Basic 6 From the Ground up” Tata Mcgraw Hill Company Limited
5. Dave Mercer, “ASP.NET A Beginner’s Guide”, Tata Mcgraw Hill Company Limited, 2002.
6. Matt J.Couch, ASP.NET and VB.NET Web Programming”, Pearson Education, 2002.

Subject Title: COMPUTER GRAPHICS AND MULTIMEDIA

Number of Instruction Hours: 4

Subject Description

This course presents the Introduction to Computer Graphics and Multimedia

Goals

To enable the students to learn the concepts of Graphics Algorithms and Multimedia.

Objectives

On Successful completion of the course the students should have:

- Understood the Basics of Graphics and related algorithms
- Understood the Multimedia and its applications with example
- Understood the importance of Data compression and various methods.

Unit I – Computer Graphics and output primitives

Concepts and applications, Random and Raster scan devices, Refresh Cathode ray tubes, LCD monitors, Laser, Printers, Keyboards, Mouse, Scanners, Graphics Software output primitives: Line drawing algorithm : DDA along with Bresenhan’s. Circle generating algorithm, Midpoint algorithms: ellipse and other curves. Attributes of output primitive, Antialiasing, Area filling: Filled area primitive: Scan-line Polygon fill Algorithm, boundary fill algorithm, flood fill algorithm.

Unit II – 2-D-Transformation, Viewing, Clipping

Two-dimensional Transformations: Translation, scaling, rotation, reflection, shear, matrix representation of all homogeneous coordinates, composite transformation. 2D-projections–parallel and perspective projection. Two dimensional viewing, Viewing pipeline Window-to-view port transformation. Clipping operations. Line Clipping: Cohen Sutherland, Nicholl-lee-Nichol land Liang-barsky, Polygon Clipping.

Unit III – 3-D Transformation and Visible surface detection

Three dimensional object representations: Polygon Surface, Tables, Plane Equation. Curved lines and Surfaces: Spline representation, Interpolating and approximation curves, continuity conditions Cubic Splines, Bezier curves B-Spline curves: characteristics and generation, 3-D Transformation. Visible Surface detection Algorithm: Object based and image based methods, depth comparison, A-Buffer, Back face removal, Scan-line method, Depth Sorting Method Area subdivision method.

Unit IV – Overview of multimedia

Overview of multimedia, Classification, basic concept of sound/audio MIDI: devices, messages, software. Speech, Video and Animation: Basic concept, computer-based animation, methods of controlling animation, display of animation, and transmission of animation.

Unit V – Data Compression

storage space, coding requirements. Source, entropy and hybrid coding some basic compression technique: runlength code, Huffman code. JPEG: Image preparation, Lossy sequential DCT – based mode, expanded lossy DCT based mode, Lossless mode, Hierarchical mode. MPEG, Huffman Encoding, LZW compression.

References Books

1. Computer Graphics by Donand Hearn & M. Pauline Baker PHI.
2. Multimedia Computing Communication & Applications“, Ralf Steimnety & Kerla Neshtudt.”
Prince Hall.
3. Principles of Interactive Compo Graphics; W.M.Newman & Robert F Sproull.
4. Computer Graphics by Rogers TMH.
5. Introduction to Computer Graphics Anirban Mukhopadhyay & Arup Chattopadhyay.
6. Schaum’s outlines – Computer Graphics Mc Graw Hill International Edition.5

Subject Title: SOFTWARE ENGINEERING

Number of Instruction Hours: 4

Subject Description: This course presents the role of software, system analysis, design concepts, methods, testing methods and strategies

Goal: To enable the students to learn the basic functions, principles and concepts of software engineering.

Objectives:

On successful completion of the course the students should have:

- Understood the role of software engineering
- Understood the design concepts, testing methods and strategies

UNIT I

The evolving role of software – Software – Software Crises and Myths – Software Engineering: Layered Technology – The software process model – Evaluating Software Process models – Component Based development – The formal methods model – 4GT – Software Project Planning: Project Planning objectives – Software Scope – resources – Software Project estimation – Decomposition Techniques – Empirical estimation models.

UNIT II

Analysis concepts & Principles: Requirement Analysis – Analysis Principles – Software Prototyping – Specification. Analysis modeling: Data Modeling – Functional modeling & information flow – Behavioral modeling.

UNIT III

Design concepts & Principles: The design process – Design Principles – Design concepts – Effective modular design.

Architectural design: Software Architecture – Data design – Analysing alternative Architectural design – Mapping requirements into software Architecture – Transform mapping – Transaction mapping.

UNIT IV

User interface design: The Golden Rules – User interface design – Task analysing and modeling – interface design activities – implementation tools – Design Evaluation.

Component level design: Structured Programming – Comparison of Design notations.

Object-Oriented design: Design for object – Oriented systems – the system design process – The object design process.

UNIT V

Software Testing Techniques: Software Testing Fundamentals – Test case design – White box Testing – Basis path Testing – Control structure testing – Black box Testing.

Software Testing strategies: A Strategic Approach to software testing – Strategic issues – Unit Testing – integration testing – Validation testing – System testing.

REFERENCE BOOKS

1. Roger S Pressman – “Software Engineering a Practioner’s Approach”, Fifth Edition, McGraw-Hill Higher Education.
2. Rajib Mall, “Fundamentals of Software Engineering”, PHI, Second Edition.
3. Sommerville, “Software Engineering”, Pearson Education, Sixth Edition.
4. Richard Fairly, “Software Engineering Concepts”, Tata McGraw Hill, 1997
5. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, “Fundamentals of Software Engineering”, Second Edition, PHI/Pearson Education Asia.

PRACTICAL VII .NET PROGRAMMING LAB

VB.NET PROGRAMS

1. Font Application
2. Notepad Application
3. Arithmetic Calculator
4. Employee Details
5. Students Information
6. Adding data into a text file

ASP.NET PROGRAMS

1. College Website
2. Online Recruitment system
3. Online Examination System
4. Online Mobile phone shop
5. Online Tax Information system
6. Online voting system

PRACTICAL VIII GRAPHICS AND MULTIMEDIA LAB

Use C++ to develop the following Program

1. Implementation of DDA algorithm
2. Implementation of Bresenham's algorithms.
 - i) Line
 - ii) Circle
 - iii) Ellipse
3. 2D Transformations:
 - i) Translation
 - ii) Rotation
 - iii) Scaling
 - iv) Reflection
 - v) Shearing of Objects
4. Cohen-Sutherland 2D clipping and windowing.
5. 3D Transformations:
 - i) Translation
 - ii) Rotation
 - iii) Scaling
6. To implement text compression algorithm.
7. To implement image compression algorithm.

Using PHOTOSHOP, FLASH

1. Basic operations using Photoshop (Various menus) (Decide individually)
2. Design a Banner with various characteristics
3. Animate Plane Flying the Clouds using Photoshop.
4. Create Stone Texture using Photoshop.
5. Create Rollover Buttons using Photoshop.
6. Create GIF / Animated file using Photoshop
7. Create Web Page using Photoshop.
8. Convert Black and White to Color Photo using Photoshop.
9. Design a Animated application using FLASH
10. Design a simple Ball Game using FLASH
11. Develop a content (teaching aid) for school children using FLASH
12. Design a movie file (include audio , video , layers etc) using FLASH

Subject Title : SOFTWARE TESTING

Number of Instruction Hours: 4

Subject Description : This course provides principles of Software Testing and tools.

Goal :

To enable the students to learn about the principle and tools of Software testing.

Objectives :

On successful completion of the course the students must have

- understood the concepts of Software testing
- got the skill of software testing
- exposed to software testing tools.

UNIT I

Purpose of Software testing – Some Dichotomies – a model for testing – Playing pool and consulting oracles – Is complete testing possible – The Consequence of bugs – Taxonomy of Bugs.

UNIT II

Software testing Fundamentals – Test case Design – Introduction of Black Box Testing and White Box testing – Flow Graphs and Path testing – Path testing Basics - Predicates, Path Predicates and Achievable Paths - Path Sensitizing – Path Instrumentation – Implementation and Application of Path Testing.

UNIT III

Transaction Flow testing – Transaction Flows – techniques – Implementation Comments – Data Flow Testing – Basics – Strategies – Applications, Tools and effectiveness – Syntax Testing – Why, What, How – Grammar for formats – Implementation – Tips.

UNIT IV

Logic Based Testing – Motivational Overview – Decision tables – Path Expressions – KV Charts – Specifications – States, State Graphs and transition Testing – State Graphs – Good & bad states – state testing Metrics and Complexity.

UNIT V

Testing GUIs – Testing Client – Server Architecture – Testing for Real-time System – A Strategic Approach to Software testing – issues – unit testing – Integration Testing – Validation testing – System testing – The art of Debugging.

REFERENCES :

1. Boris Beizer, Software testing techniques, Dreamtech Press, Second Edition – 2003.
2. Myers and Glenford.J., The Art of Software Testing, John-Wiley & Sons,1979
3. Roger.S.Pressman, Software Engineering – A Practitioner’s Approach ,Mc-Graw Hill, 5th edition, 2001
4. Marnie.L. Hutcheson, Software Testing Fundamentals, Wiley-India,2007

Subject Title : NETWORK SECURITY and CRYPTOGRAPHY

Number of Instruction Hours: 4

Subject Description: deals with principles of encryption algorithms, and conventional and public key cryptography.

Goal: enable to know the levels of network security and security tools.

Objective: to impart knowledge regarding cryptography and network security.

UNIT-I

Service mechanism and attacks – The OSI security architecture – A model for network security – symmetric Cipher model – Substitution techniques – transposition techniques – simplified des – block chipper principles – the strength of des – blockchipper design principles and modes of operation.

UNIT-II

Triple des-blow fish – RCS Advanced Symmetric Block Ciphers –RC4 stream Cipher confidentially using symmetric encryption – introduction to number theory – public – key cryptography and RSA.

UNIT-III

Key management – Diffle Hellman key exchange – message authentication and hash function – hash algorithm – digital signature and authentication protocols – digital signature standard.

UNIT-IV

Authentication application – pretty good privacy – S/MIME – ip security – web security considerations –secure socket layer transport layer security –secure electronic transaction.

UNIT-V

Intruders –intrusion detection – password management –viruses and related threats – virus countermeasures – fire wall design principles – trusted systems

REFERENCE BOOKS:

1. William Stallings, “Cryptography and Network Security Principles and Practices”. Fourth Edition, PHI.
2. Atul Kahate “Cryptography and Network Security” second edition. TMH.
3. Behrouz A.forouzan” Cryptography and Network Security “ TMH.

Subject Title: DATA MINING AND WAREHOUSING

Number of Instruction Hours: 4

Subject Description:

This course presents the basic data mining, data mining techniques, classification, clustering and data warehousing.

Goal:

To enable the students learn the data mining techniques and data warehousing concepts.

Objectives:

On successful completion of the course the students should have:

- Understood the data mining and data warehousing techniques.

UNIT I

Basic data mining tasks – data mining versus knowledge discovery in databases – data mining issues – data mining metrics – social implications of data mining – data mining from a database perspective.

Data mining techniques: Introduction – a statistical perspective on data mining – similarity measures – decision trees – neural networks – genetic algorithms.

UNIT II

Classification: Introduction – Statistical – based algorithms - distance – based algorithms – decision tree - based algorithms - neural network – based algorithms –rule - based algorithms – combining techniques.

UNIT III

Clustering: Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms - Partitional Algorithms.

Association rules: Introduction - large item sets - basic algorithms – parallel & distributed algorithms – comparing approaches- incremental rules – advanced association rules techniques – measuring the quality of rules.

UNIT IV

Data warehousing: an introduction - characteristics of a data warehouse – data marts – other aspects of data mart. Online analytical processing: introduction - OLTP & OLAP systems – data modelling –star schema for multidimensional view –data modelling – multifact star schema or snow flake schema – OLAP TOOLS – State of the market – OLAP TOOLS and the internet.

UNIT V

Developing a data WAREHOUSE: why and how to build a data warehouse –data warehouse architectural strategies and organization issues - design consideration – data content – metadata distribution of data – tools for data warehousing – performance considerations – crucial decisions in designing a data warehouse.

Applications of data warehousing and data mining in government: Introduction - national data warehouses – other areas for data warehousing and data mining.

REFERENCE BOOKS

1. Margaret H. Dunham, “Data mining introductory and advanced topics”, Pearson education, 2003.
2. C.S.R. Prabhu, “Data warehousing concepts, techniques, products and applications”, PHI, Second Edition.
3. Arun K.Pujari, “ Techniques”, Universities Press (India) Pvt. Ltd., 2003.
4. Alex Berson, Stephen J. Smith, “data warehousing, data mining, & OLAP, TMCH, 2001.
5. Jiawei Han & Micheline Kamber, “ Data mining Concepts & Techniques”, 2001, Academic press

PRACTICAL IX - MINI PROJECT (GUIDELINES FOR MINI PROJECT)

- The aim of the Mini Project is to lay a foundation for the Main Project.
- Each student should carry out individually one Mini Project Work and it may be a case study using the software packages that they have learned or may be an implementation of a concept in a paper prescribed on a journal.
- It should be compulsorily done in the college only under the supervision of the staff concerned.
- University Exam will be conducted as like a practical exam with one Internal and one External Examiner, which carries 50 marks for project evaluation and 25 marks for viva examination. Remuneration for the examiners is equivalent as that of practical examination.

PRACTICAL X

SOFTWARE TESTING TOOLS LAB

Various S/W Testing Can Be Done Related To the Methods Given Below Using Any of the S/W Testing Tools

1. Design Phase testing
2. Program Phase Testing.
3. Debugging
4. Evaluation of test results
5. Installation phase testing & Acceptance testing

ELECTIVE – I

E 1.1 : Client Server Technology

Number of Instruction Hours: 4

Subject Description:

This course presents the overview of client/server computing, client/server hardware and software requirements, application development and production environments.

Goal:

To enable the students to learn the concept of client/server computing

Objectives:

On successful completion of the course the students should have:

- Understood the client/server computing techniques
- Understood the client/server application development and production environments

UNIT I

Overview of Client/Server computing: What is Client/Server Computing-Benefits of Client/Server Computing-Evolution of Client/server Computing: Hardware and Software Trends-Overview of Client /Server Applications: Components of Client/Server Application-Classes of client/server application-Categories of Client/Server Applications-Understanding Client /Server Computing: Obstacles-Open systems and standards-Factor for success

UNIT II

The Client Hardware and Software: Client Components-Client operating systems-GUI-X Windows versus Windowing-Database access-Application logical-Client Software Products: GUI Environment-Database access tools Client Requirements-The Server- Categories –Features of Server Machines-Classes of Server Machines-Server Environment.

UNIT III

Server Requirements-Server Data Management and Access Tools-Data Manager Features-Data Management Software-Database Gateways-Overview of Networking-LAN Hardware and Software: LAN Hardware-Network Operating Systems

UNIT IV

Applications Development Environments-Managing the Production Environment-Distributed Transaction Management-Integrating Multivendor Environments

UNIT V

Production Requirements: System Management-Network Management-Runtime Specifications-Distributing Software Updates-Hardware and Software Trends

REFERENCE BOOKS:

1. Dawna Travis Dewire, “ Client Computing”, Tata McGRAW-Hill Edition, 2003
2. Robert Orfali, Dan Harkey and Jerri Edwards, “Essential Client/Server Survival Guide”, John Wiley & Sons Inc., 1996.
3. Joe Salemi, “Client/Server Databases”.
4. Patrick Smith et al., “Client/Server Computing”.
5. Larry I.Vaughn, “Client/Server System Design and Implementation”.
6. Alex Berson, “Client/Server Architecture”.
7. Neil Jenkins et al., “Client/Server Unleashed”.

ELECTIVE – I
E 1.2 : DIGITAL IMAGE PROCESSING

Number of Instruction Hours: 4

Subject Description

This course presents the Introduction to Digital image Processing, fundamentals, image enhancement and image restoration techniques

Goals

To enable the students to learn the fundamentals of Digital Image Processing, image compression and segmentation

Objectives

On Successful completion of the course the students should have:

- Understood the fundamentals of Digital Image Processing, image compression and segmentation

UNIT I

Introduction: What is Digital image processing – the origin of DIP – Examples of fields that use DIP – Fundamentals steps in DIP – Components of an image processing system.

Digital Image Fundamentals: Elements of Visual perception – Light and the electromagnetic spectrum – Image sensing and acquisition – Image sampling and Quantization – Some Basic relationship between Pixels – Linear & Nonlinear operations.

UNIT II

Image Enhancement in the spatial domain:- Background – some basic Gray level Transformations – Histogram Processing – Enhancement using Arithmetic / Logic operations – Basics of spatial filtering – Smoothing spatial filters – Sharpening spatial filters – Combining spatial enhancement methods.

UNIT III

Image Restoration: A model of the Image Degradation / Restoration Process – Noise models – Restoration is the process of noise only – Spatial Filtering – Periodic Noise reduction by frequency domain filtering – Linear, Portion – Invariant Degradations – Estimating the degradation function – Inverse filtering – Minimum mean square Error Filtering – Constrained least squares filtering – Geometric mean filter – Geometric Transformations.

UNIT IV

Image Compression: Fundamentals – Image compression models – Elements of Information Theory – Error Free compression – Lossy compression – Image compression standards.

UNIT V

Image Segmentation: Detection and Discontinuities – Edge Linking and Boundary deduction – Thresholding – Region-Based segmentation – Segmentation by Morphological watersheds – The use of motion in segmentation.

REFERENCE BOOKS

1. Rafael C. Gonzalez, Richard E. Woods, "Digital Image Processing", Second Edition, PHI/Pearson Education.
2. B. Chanda, D. Dutta Majumder, "Digital Image Processing and Analysis", PHI, 2003.
3. Nick Efford, "Digital Image Processing a practical introducing using Java", Pearson Education, 2004.

ELECTIVE – I E 1.3 : OPEN SOURCE SOFTWARE

Number of Instruction Hours: 4

Subject Description

This course presents the Introduction to Open Source Software and its various types. In addition two languages such as PERL and PHP are taught.

Goals

To enable the students to learn the fundamentals of Open Source software and get experience in PERL and PHP.

Objectives

On successful completion of the course the students should have:

- To Learn PERL and PHP

Unit I

Overview of Free/ Open Source Software: The Open Source Definition - Examples of OSD Compliant Licenses - Examples of Open Source Software Product – The Open Source Software Development Process – A History of Open Source software: The Berkeley Software Distribution – The Free Software Foundation – Linux – Apache – Mozilla – Open Source Software.

Unit II

Qualification: Defining Open Source Software – Categorizing Defining Open Source Software – Specific Characteristics of Open Source Software Transformation: The OSS Development Process – Taboos and Norms in OSS Development – The OSS Development Life Cycle – Deriving a Framework for Analyzing OSS – Zachman's Framework for IS Architecture – CATWOE and Soft System Method – Deriving the Analytical Framework for OSS.

Unit III

Environment: The "where" of OSS – the "when" of OSS – World View: A Framework for classifying OSS Motivations – Technological Micro-level (individual) motivation – Economic Micro-level and Macro-level (individual) Motivation – Socio-political Micro-level and Macro-level (individual) Motivation.

Open Source Server Applications: Infrastructure Services – Web Services – Database Servers – Mail Servers – Systems Management – Open Source Desktop Applications: Introduction – Graphical Desktops – Web Browsers – The Office Suite – Mail and Calendar Clients – Personal Software – Cost of OSS: Total Cost of Ownership – Types of Costs Licensing: Types of Licenses – Licenses in Use – Mixing Open and Close Code – Dual Licensing.

Unit IV

Perl Programming

Perl - Introduction, Perl Basics: - Syntax, Variables, Strings, Numbers, Operators, Arrays: - Using Arrays, Manipulating Arrays, Associative Arrays, Chop, Length, and Sub string. Hashes, Arguments, Logic, Looping, Files, Pattern Matching, Environment Variables, Using cgilib for Forms. File Management PERL: - File Handling, Reading From Files, Appending Files, Writing to Files, File Checking, Reading Directories. Databases PERL: - DBI Module, DBI Connect, DBI Query, MySQL Module, MySQL Connect, MySQL SelectDB, MySQL Query.

Unit V

PHP Programming Basics :PHP - Introduction, PHP Basics: - Syntax- Variables- Controls and functions - Strings. Arrays: - Using Arrays, Manipulating Arrays, Associative Arrays
OOP with PHP –Advanced Array functions-Sessions-cookies and HTTP.

Reference Books

1. Joseph Feller, Brain Fitzgerald, Eric S. Raymond, “Understanding Open Source Software Development”, Addison-Wesley Professional, 1st Edition, 2001.
2. Perl CookBook –Tom Christinasen & Nathan Torkington , O“Relliy ,SPD Pvt ltd,2006 Edition.
3. PHP 5 and MySQL Bible Wiley Dream Teck India Pvt.ltd 2006 .

ELECTIVE II

E.2.1 : Mobile Computing

Number of Instruction Hours: 4

Subject Description:

This course presents the overview of Mobile computing, Applications and Architectures. Also describes the futuristic computing challenges.

Goal:

To enable the students to learn the concept of mobile computing

Objectives:

On successful completion of the course the students should have:

- Understood the mobile computing applications, techniques
- Understood the mobile computing environment

UNIT - I

Introduction: Advantages of Digital Information - Introduction to Telephone Systems –Mobile communication: Need for Mobile Communication – Requirements of Mobile Communication – History of Mobile Communication.

UNIT - II

Introduction to Cellular Mobile Communication – Mobile Communication Standards –Mobility Management – Frequency Management – Cordless Mobile Communication Systems.

UNIT - III

Mobile Computing: History of data networks – Classification of Mobile data networks - CDPD System – Satellites in Mobile Communication: Satellite classification – Global Satellite Communication – Changeover from one satellite to other – Global Mobile Communication – Interferences in Cellular Mobile Communication.

UNIT - IV

Important Parameters of Mobile Communication System – Mobile Internet: Working of Mobile IP – Wireless Network Security – Wireless Local Loop Architecture: Components in WLL – Problems in WLL – Modern Wireless Local Loop – Local Multipoint Distribution Service – Wireless Application Protocol.

UNIT -V

WCDMA Technology and Fibre Optic Microcellular Mobile Communication – Ad hoc Network and Bluetooth technology – Intelligent Mobile Communication system – Fourth Generation Mobile Communication systems.

REFERENCE BOOK:

1. T.G. Palanivelu, R. Nakkeeran, Wireless and Mobile Communication, PHI Limited.2009
2. Jochen Schiller, Mobile Communications, Second Edition, Pearson Education.2007
3. Asoke K Talukder,Hasan Ahmed,Roopal Yavagal, Mobile Computing , TMH, 2010

ELECTIVE II
E 2.2 : Distributed Computing

Number of Instruction Hours: 4

Subject Description

This course presents the Introduction to fully Distributed Processing Systems, Communication Line Loading and Client/Server Network Model.

Goals

To enable the students to learn the concepts of Distributed Computing

Objectives

On Successful completion of the course the students should have:

- Understood the Distributed Processing Systems Design, Client/Server Network Model and Distributed databases.

UNIT I

Distributed Systems: Fully Distributed Processing Systems – Networks and Interconnection Structures – Designing a Distributed Processing System.

UNIT II

Distributed Systems: Pros and Cons of Distributed Processing – Distributed Databases – The Challenge of Distributed Data – Loading Factors – Managing the Distributed Resources – Division of Responsibilities.

UNIT III

Design Considerations: Communication Line Loading – Line Loading Calculations – Partitioning and Allocation – Data Flow Systems – Dimension Analysis – Network Database Design Considerations – Ration Analysis – Database Decision Trees – Synchronization of Network Databases.

UNIT IV

Client/Server Network Model: Concept – File Server – Printer Server – an e-mail Server.

UNIT V

Distributed Databases: An overview – Distributed Databases – Principles of Distributed Databases – Levels of Transparency – Distributed Database Design – The R* Project Technique Problems of Heterogeneous Distributed Databases.

REFERENCE BOOKS

1. John A. Sharp, “An Introduction to Distributed and Parallel Processing”, Blackwell Scientific Publications, 1987.
2. Uyles D. Black, “Data Communications & Distributed Networks”.
3. Joel M. Crichlow, “Introduction to Distributed & Parallel Computing”.
4. Stefans Ceri, Ginseppe Pelagatti, “Distributed Databases Principles and systems”, McGraw Hill Book Co., New York, 1985.

ELECTIVE II

E 2.3 : CLOUD COMPUTING

Number of Instruction Hours: 4

Subject Description:

This course presents the introduction to Cloud computing, cloud services, architectures and applications.

Goal:

To enable the students to learn the basics of cloud computing and its applications, architecture

Objectives:

On successful completion of the course the students should have:

- Understood the Cloud computing architectures, applications and challenges

UNIT – I INTRODUCTION

Cloud Computing Introduction, From, Collaboration to cloud, Working of cloud computing, pros and cons, benefits, developing cloud computing services, Cloud service development, discovering cloud services.

UNIT – II CLOUD COMPUTING FOR EVERYONE

Centralizing email communications, cloud computing for community, collaborating on schedules, collaborating on group projects and events, cloud computing for corporation, mapping schedules managing projects, presenting on road

UNIT – III USING CLOUD SERVICES

Collaborating on calendars, Schedules and task management, exploring on line scheduling and planning, collaborating on event management, collaborating on contact management, collaborating on project management, collaborating on word processing, spreadsheets, and databases.

UNIT – IV OUTSIDE THE CLOUD

Evaluating web mail services, Evaluating instant messaging, Evaluating web conference tools, creating groups on social networks, Evaluating on line groupware, collaborating via blogs and wikis

UNIT – V STORING AND SHARING

Understanding cloud storage, evaluating on line file storage, exploring on line book marking services, exploring on line photo editing applications, exploring photo sharing communities, controlling it with web based desktops.

REFERENCES:

1. Michael Miller, “Cloud Computing”, Pearson Education, New Delhi, 2009
Anthony T. Velte, Cloud Computing A Practical Approach 1st Edition, Tata Mcgraw Hill Education Private Limited (2009)

ELECTIVE III
E.3.1: Web Services

Number of Instruction Hours: 3

Subject Description

This Course presents the Web Services Provided.

Goal : To enable the students to learn what is web service and Protocols used for Web services

Objective

On successful completion of the course the students should have:

- Understood how to build the real world applications using Web Services.

Unit I

Introduction to Web Services – Industry standards, Technologies and Concepts underlying Web Services – their support to Web Services, Applications that consume Web Services.

Unit II

XML – its choice for Web Services – Network protocols to backend databases – Technologies – SOAP, WSDL – exchange of information between applications in distributed environment – Locating remote Web Services – its access and usage, UDDI Specification – an introduction.

Unit III

A brief outline of Web Services – Conversation – static and interactive aspects of system interface and its implementation, Work Flow – Orchestration and refinement, Transactions, Security issues – the Common attacks – security attacks facilitated within Web services Quality of Services – Architecting of systems to meet users requirement with respect to latency, performance, reliability, QOS metrics, Mobile and wireless Services – energy consumption, network bandwidth utilization, Portals and Services Management.

Unit – IV

Building real world Enterprise applications using Web Services – sample source codes to develop Web Services – Steps necessary to build and deploy Web Services and Client applications to meet Customer’s requirement – Easier development, Customisation, maintenance, Transactional requirements, seamless porting to multiple devices and platforms.

Unit – V

Development of Web Services and applications onto Tomcat application Server and Axis SOAP server (both are freewares) – Web Services Platform as a set of Enabling technologies for XML based distributed Computing.

REFERENCE BOOKS :

1. Sandeep Chatterjee, James Webber, “Developing Enterprise Web Services: An Architects Guide”, Prentice Hall, Nov 2003
2. Keith Ballinger, “NET Web services: Architecture and Implementation with .Net”, Pearson Education, First Education Feb 2003.
3. Ramesh Nagappan, Developing Java Web Services: Architecting and developing secure Web Services Using Java”, John Wiley and Sons, first Edition Feb 2003
4. Eric A Marks and Mark J Werrell, “Executive Guide to Web services”, John Wiley and sons, March 2003
5. Anne Thomas Manes, “Web Services: A managers Guide” Addison Wesley, June 2003.

ELECTIVE III

E.3.2 Middleware Technologies

Number of Instruction Hours: 4

Subject Description:

This course presents the overview of middleware technologies which plays important role in today's technologies such as RPS, CORBA and web services

Goal:

To enable the students to learn the concept of middleware technologies

Objectives:

On successful completion of the course the students should have:

- Understood the need for middleware technology
- Understood the CORBA, OOM, Web services and agent based services

UNIT I

INTRODUCTION: Emergence of Middleware – Objects, Web Services – Middleware Elements – Vendor Architecture – Interoperability – Middleware in Distributed Applications – Types of Middleware – Transaction-Oriented Middleware – MOM – RPC.

UNIT II

OBJECT ORIENTED MIDDLEWARE : OOM – Developing with OOM – Heterogeneity – Dynamic Object Request – Java RMI – COM+.

UNIT III:

CORBA : Naming – Trading – Life Cycle – Persistence – Security – CORBA.

UNIT IV:

WEB SERVICES : Introduction – XML Web Services standards – Creating Web Services – Extending Web Services – Messaging Protocol – Describing – Discovering – Securing.

UNIT V :

OTHER TYPES OF MIDDLEWARE : Real-time Middleware – RT CORBA – Multimedia Middleware – Reflective Middleware – Agent-Based Middleware – RFID Middleware.

REFERENCES BOOKS

1. Chris Britton and Peter Eye, "IT Architecture and Middleware", Pearson Education, 2nd Edition, 2004.
2. Wolfgang Emmerich, "Engineering Distributed Objects", John Wiley, 2000.
3. Keith Ballinger, ".NET Web Services – Architecture and Implementation", Pearson Education, 2003.
4. Qusay H. Mahmoud, "Middleware for Communications", John Wiley and Sons, 2004.
5. Gerald Brose, Andreas Vogel, Keith Duddy, "Java™ Programming with CORBATM: Advanced Techniques for Building Distributed Applications", Wiley, 3rd edition, January, 2004.
6. Michah Lerner, "Middleware Networks: Concept, Design and Deployment of Internet Infrastructure", Kluwer Academic Publishers, 2000.

ELECTIVE III
E.3.3 NEURAL NETWORKS

Number of Instruction Hours: 4

Subject Description:

This course presents the introduction to the basic neuron, kohonen self-organizing network, hop field networks, associative memory, fuzzy.

Goal:

To enable the students to learn the basic functions, principles and concepts of Neural Networks.

Objectives:

On successful completion of the course the students should have:

- Understood the pattern classification in Neural Networks
- Understood the fuzzy relation and fuzzy logic

UNIT I

Pattern classification - Learning and Generalization - Structure of neural networks - ADA line, Delta rule - input output value - perceptions - Linear separability - Back propagation - XOR Function - Introduction to Boolean neural networks.

UNIT II

Hopfield Networks - Energy - The Hamming Network - RAM - Boltzmann machine - Instar, outstar network - ART - Kohonen's Network Neocognitron.

UNIT III

Fuzzy relation - Member function - Fuzzy matrices - Fuzzy entropy - Fuzzy operation - Fuzzy composition.

UNIT IV

Fuzzy variables - Linguistic variables - Measure of fuzziness - Transition Matrix - Concept of Defuzzication and Applications

UNIT V

CASE STUDY: Application of Neural Networks in character recognition, drug discovery, speech recognition; Application of Fuzzy logic concepts in Fuzzy controller design and Fuzzy querying in Relational database model.

REFERENCE BOOKS

1. P.D.Wasserman, "Neural computing and practice", Van Nostran Reinhold, New York, 1991.
2. Limin Fu, "Neural Network in computer Intelligence ", McGraw Hill International editions, 1994.
3. B Kosko, " Neural Network and Fuzzy systems", Prentice Hall, 1996.
4. Klir & Yuan, "Fuzzy sets and Fuzzy logic", Theory and Applications, Prentice Hall of India, 1996.

ELECTIVE IV

E.4.1. E-COMMERCE

Number of Instruction Hours: 4

Subject Description:

This course presents the introduction to E-Commerce, Network Infrastructure, Information publishing technology, Securing network transaction, search engines.

Goal:

To enable the students to learn the basic functions, principles and concepts of E-Commerce.

Objectives:

On successful completion of the course the students should have:

- Understood the E-Commerce framework

UNIT I

Electronic Commerce framework – Electronic Commerce of Media convergence- The Anatomy of E-commerce applications – Electronic Commerce Applications – Electronic Commerce Organization Applications – Market Forces Influencing the I-way – Components of the I-way – Network Access Equipment – the Last Mile: Local roads and access Ramps – Global Information Distribution Networks – Public policy Issues shaping the I-way

UNIT II

Architectural framework for electronic commerce – World Wide web (WWW) as the architecture – Web background: Hypertext publishing – Technology behind the web – security and the web – Consumer-oriented applications – Mercantile models from the consumer's perspective – Mercantile models from the Merchant's Perspective

UNIT III

Types of Electronic payment systems – Digital Token-Based Electronic Payment Systems – Smart cards and Electronic Payment Systems – Credit Card based Electronic Payment systems – Risk and Electronic Payment Systems – Designing electronic payment systems - Electronic data interchange – EOI Applications in Business – EDI: Legal, Security, and Privacy issues – EDI and Electronic Commerce.

UNIT IV

Internal Information systems – Macroforces and Internal Commerce – Work Flow Automation and Coordination Customization and Internal commerce – Supply chain commerce systems – making a business case for a document Library – Types of digital documents – Issues behind Document Infrastructure – corporate Data warehouses.

UNIT V

The New Age of Information-Based Marketing – Advertising on the Internet- charting the Online Marketing process – Market Research – Search and Resource Discovery Paradigms – Information search and Retrieval – Electronic commerce Catalogs or Directories – Information Filtering – Consumer – Data Interface Emerging Tools.

REFERENCE BOOKS

1. Ravi Kalakota, Andrew B. Whinston, “ Frontiers of Electronic Commerce”, Pearson Education Asia, 2003.
2. Jeffery F. Rayport, Bernard J. Jaworski, “E- Commerce”, TMCH, 2002.
3. P.T. Joseph, “E- Commerce – A Managerial Perspective”, PHI, 2003.

ELECTIVE IV
E.4.2. EMBEDDED SYSTEMS

Number of Instruction Hours: 4

Subject Description:

This course presents the introduction to embedded systems, Devices and Buses for Device Networks, Program modelling concepts, Inter – process communication & Synchronization of processes, Tasks and threads.

Goal:

To enable the students learns the embedded systems concepts and fundamentals.

Objectives:

On Successful completion of the course the students should have:

- Understood the RTOS concepts.
- Understood the Embedded software Development

UNIT I

Introduction to Embedded Systems: An embedded System – Processor in the system – Other hardware units – software embedded into a system – Exemplary Embedded systems – On chip and in VLSI Circuit. Processor and Memory selection for an Embedded systems.

UNIT II

Devices and Buses for Device Networks: I/O devices – Timer and counting Devices. Device Drivers and Interrupts Servicing Mechanism: Device drivers – Parallel Port device drivers in a system – Serial Port device in a system – Device drivers for internal programmable timing devices – Interrupt servicing mechanism – context and the periods for context-switching, deadline and interrupt latency

UNIT III

Program modeling concepts in single & Multiprocessor systems software- Development Process: Modeling Processes for Software analysis before software Implementation – Programming models for event controlled or response time constrained real time programs – Modeling for microprocessor systems. Software Engineering Practices in the Embedded Software Development Process: Software algorithm complexity – Software Development process life cycle and its models – Software analysis – Software design – Software implementation – Software Testing, Validating and Debugging – Real time programming issues during the software development process – Software project management – Software maintenance – UML.

UNIT IV

Inter – process communication & Synchronization of processes, Tasks and threads: Multiple processes in an application – Problem of sharing data by multiple tasks and routines – Inter Process communication.

REAL TIME OPERATING SYSTEM:- Real time and Embedded systems operating systems – Interrupt routines in RTOS environment – RTOS Task scheduling models, Interrupt latency and Response times of the Tasks as performance Metrics – performance Metric in scheduling models for periodic, sporadic and Aperiodic Tasks – IEEE standard POSIX 1003.1b

functions for Standardization of RTOS and Inter-task communication functions – List of Basic actions in a preemptive scheduler and Expected times taken at a processor – Filters – point strategy for synchronization between the processes, ISRs, OS functions and tasks and for Resource management – Embedded Linux Internals

UNIT V

Hardware – Software co-design in an embedded System: Embedded System Project Management – Embedded system design and co-design issues in system development processes – Design cycle in the development phase for an Embedded system – Uses of Target system, or its Emulator and In-circuit Emulator – Use of software tools for development of an embedded system – Use of scopes and logic analysis for system hardware tests – Issues in Embedded system design

Case Study: An Embedded System for an Adaptive cruise control system in a car, embedded system for a smart card.

REFERENCE BOOKS

1. Raj Kamal, “Embedded Systems – Architecture, programming and design”, Tata Mcgraw – Hill, 2003.
2. David E. Simon, “An Embedded Software primer” Pearson Education Asia, 2003.

ELECTIVE IV

E.4.3 INFORMATION RETRIEVAL TECHNIQUES

Number of Instruction Hours: 4

Subject Description:

This course presents the introduction to retrieval of information from the web, various applications and query structures. Also describes multimedia information retrieval process.

Goal:

To enable the students to learn the basics of search operation on the web

Objectives:

On successful completion of the course the students should have:

- Understood the various methods being followed to retrieve the contents from the web like text, image and multimedia contents.

UNIT I

INTRODUCTION : Basic Concepts – Retrieval Process – Modeling – Classic Information Retrieval – Set Theoretic, Algebraic and Probabilistic Models – Structured Text Retrieval Models – Retrieval Evaluation – Word Sense Disambiguation

UNIT II

QUERYING : Languages – Key Word based Querying – Pattern Matching – Structural Queries – Query Operations – User Relevance Feedback – Local and Global Analysis – Text and Multimedia languages

UNIT III

TEXT OPERATIONS AND USER INTERFACE : Document Preprocessing – Clustering – Text Compression - Indexing and Searching – Inverted files – Boolean Queries – Sequential searching – Pattern matching – User Interface and Visualization – Human Computer Interaction – Access Process – Starting Points –Query Specification - Context – User relevance Judgment – Interface for Search

UNIT IV

MULTIMEDIA INFORMATION RETRIEVAL : Data Models – Query Languages – Spatial Access Models – Generic Approach – One Dimensional Time Series – Two Dimensional Color Images – Feature Extraction

UNIT V

APPLICATIONS : Searching the Web – Challenges – Characterizing the Web – Search Engines – Browsing – Meta-searchers – Online IR systems – Online Public Access Catalogs – Digital Libraries – Architectural Issues – Document Models, Representations and Access – Prototypes and Standards

REFERENCES

1. Ricardo Baeza-Yate, Berthier Ribeiro-Neto, “Modern Information Retrieval”, Pearson Education Asia, 2005.
2. G.G. Chowdhury, “Introduction to Modern Information Retrieval”, Neal-Schuman Publishers; 2nd edition, 2003.
3. Daniel Jurafsky and James H. Martin, “Speech and Language Processing”, Pearson Education, 2000
4. David A. Grossman, Ophir Frieder, “ Information Retrieval: Algorithms, and Heuristics”, Academic Press, 2000
5. Charles T. Meadow, Bert R. Boyce, Donald H. Kraft, “Text Information Retrieval Systems”, Academic Press, 2000